C++ code for estimating diurnal solar radiation in areas with complex terrain

The code was tested using Microsoft Visual C++ (Win32 Console Applications). The input and output files are put directly under the code folder. Users can copy and save the included input data to a text file to test the code.

The input data needed are: Latitude, slope, aspect, viewshed angles, daily total solar radiation received on a horizontal surface without topographic effects, and the fraction of diffuse radiation. The viewshed angles are the angular distribution of sky visibility versus obstruction, similar to the view taken by upward-looking hemispherical (fisheye) photographs from the site. Sixteen angles are used in the input to represent the sky visibility.

In this code, daily total solar radiation without topographic effects is estimated from daily minimum and maximum air temperature. The parameters are estimated from the observations in Inuvik climate station (68.32 ^{o}N, 133.53 ^{o}W). The parameters may differ with time and place. Users need to estimate their parameters, or can use observations or better methods if available.

Copy right and citation:
Zhang, Y., Wang, X., Fraser, R., Olthof, I., Chen, W., Mclennan, D., Ponomarenko, S., and Wu, W.: Modelling and mapping climate change impacts on permafrost at high spatial resolution for a region with complex terrain, The Cryosphere Discussion, 6, 4599-4636, doi:10.5194/tcd-6-4599-2012, 2012.

Detailed descriptions about the method and equations can be found in the appendix of the above paper.

----------**Beginning of the code**----------

```
//Microsoft Visual C++ code for estimating diurnal solar radiation in area with complex terrain
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
#include <string.h>

#define Pi 3.1415926
#define RAD 0.017453292  //radians for one degree: Pi/360.0
#define TimeStep 1.0     //time-step (hour), can be modified directly

void Integration_Factors_Etc(int DOY, double sin_Lat, double cos_Lat, double Factors[], double Mid[]);
double Slope_Solar_Rad(int DOY, double Time, double Day_Length, double sin_Lat, double cos_Lat, double cos_Slope,
   double sin_Slope, double cos_sFactors0, double DayF_Diffuse, double Rad0, double Slope, double Aspect, double
   ViewShed[], double ViewshedF_Diffuse, double sFactors[]);

int main() {
char Char[201];
int i, j, Y, M, D;
int DOY, Leap_Year_Flag, YearDays;
```

```
double Latitude, Slope, Aspect, ViewShed[16];
double sin_Lat, cos_Lat, sin_Slope, cos_Slope;

double Daily_Tmin[366], Daily_Tmax[366], Daily_Tair[366], Daily_DTair[366], Daily_Vap[366];
double RAD_Above[366], Daily_Solar_Rad[366], Day_Length[366], sFactors[366][4], cos_sFactors0[366];

double Time, Sun_Set, Sun_Rise;
double ViewshedF_Diffuse, Rad_Avg, DayF_Diffuse, Rad_S;
double F, P, Mid[2];  //mid variables
FILE *fpt_Input, *fpt_Output;

//open output file and print the head line
if((fpt_Output = fopen("Output.txt", "w")) == NULL) {
   printf("Couldn't open output file");
   exit(0);
}
fprintf(fpt_Output, "DOY   DL   Rad0 ");
for(Time=0; Time<24.0; Time +=TimeStep) fprintf(fpt_Output, "%7.1lf ", Time);
fprintf(fpt_Output, "\n");

//open and read input file
if((fpt_Input = fopen("Input.txt", "r")) == NULL) {
   printf("Couldn't open input file ");
   exit(0);
}

fgets(Char, 200, fpt_Input);  //a note line
fscanf(fpt_Input, "%lf", &Latitude); fgets(Char, 200, fpt_Input);
fscanf(fpt_Input, "%lf", &Slope);    fgets(Char,200, fpt_Input);
fscanf(fpt_Input, "%lf", &Aspect);   fgets(Char,200, fpt_Input);
fgets(Char, 200, fpt_Input);   //a note line
for(i=0; i<8; i++)  fscanf(fpt_Input, "%lf", &ViewShed[i]);  fgets(Char, 200, fpt_Input);
for(i=8; i<16; i++) fscanf(fpt_Input, "%lf", &ViewShed[i]);  fgets(Char, 200, fpt_Input);

//data range checking
if(Latitude<-90.0 || Latitude >90.0) {
   printf("The Latitude (%lf) is out of the range (-90 to 90)\n", Latitude);
   exit(0);
}
if(Slope<0.0 || Slope>90.0) {
   printf("The Slope (%lf) is out of the range (-90 to 90)\n", Slope);
   exit(0);
}
if(Aspect<0.0 || Aspect>360.0) {
   printf("The Aspect (%lf) is out of the range (0 to 360)\n", Aspect);
```

```
   exit(0);
}
for(i=0; i<16; i++) {
   if(ViewShed[i]<0.0 || ViewShed[i]>90.0) {
      printf("The viewshed (No.%d:  %lf) is out of the range (0 to 90)\n", i, ViewShed[i]);
      exit(0);
   }
}

//convert from degree to radians
Latitude *= RAD;
Slope    *= RAD;
Aspect   *= RAD;
for(i=0; i<16; i++) ViewShed[i] *= RAD;

sin_Lat = sin(Latitude);      cos_Lat = cos(Latitude);
sin_Slope = sin(Slope);       cos_Slope = cos(Slope);

fgets(Char, 200, fpt_Input);
fgets(Char, 200, fpt_Input);

//calculating Shusen Wang's integration factors, day length and daily extraterrestrial solar radiation
for(DOY=0; DOY<366; DOY++) {
    Integration_Factors_Etc(DOY, sin_Lat, cos_Lat, sFactors[DOY], Mid);
    Day_Length[DOY] = Mid[0];
    RAD_Above[DOY]  = Mid[1];   //used for estimating daily solar radiation on the ground
    cos_sFactors0[DOY] = cos(sFactors[DOY][0]);
}
//calculating the effects of viewsged on diffuse radiation
P=0;
ViewshedF_Diffuse = 0;
for(i=0; i<16; i++) {       //loop for azimuth directions
   for(j=0; j<90; j++) {    //loop for elevation angles (in degrees)
      F = sin(j*RAD)*cos(j*RAD);
      P += F;
      if(j>=ViewShed[i]/RAD)  ViewshedF_Diffuse += F;
   }
}
ViewshedF_Diffuse /= P;        //relative diffuse radiation or fraction of sky not blocked

//----------add year loop here if more than one year climadte is calculated --------------------
// Estimating daily solar radiation on the ground (without topographic effects)
// -- Users can directly use observations or better estimates if available.
// read daily min and max air temperature (for estimating daily solar radiation)
Leap_Year_Flag = 0;     //1 if is a leap-year, 0 for non-leap-year
YearDays = 365 + Leap_Year_Flag;
```

```
for(DOY=0; DOY<YearDays; DOY++) {
   fscanf(fpt_Input, "%d %d %d %lf %lf", &Y, &M, &D, &Daily_Tmax[DOY], &Daily_Tmin[DOY]);
}

//Estimating vapor pressure and daily total solar radiation based on daily max and min air temperature
for(DOY=0; DOY<YearDays; DOY++) {
   Daily_Tair[DOY] = (Daily_Tmin[DOY] + Daily_Tmax[DOY])/2.0;
   Daily_DTair[DOY] = Daily_Tmax[DOY] - Daily_Tmin[DOY];
   Daily_Vap[DOY] = 0.92 * 6.11*exp(17.27*Daily_Tmin[DOY]/(Daily_Tmin[DOY]+237.3)); //0.92: parameter may differ
   with time and location
   if(Daily_DTair[DOY]>0.5) F = Daily_DTair[DOY];
   else F = 0.5;
// parameters 1.06, -0.06, 1.25, 0.02 may differ with time and location
   P = 1.06*(1-exp(-0.06*pow(F, 1.25))) * (1-0.02*Daily_Vap[DOY]);
   Daily_Solar_Rad[DOY] = P * RAD_Above[DOY];  //estimated daily solar radiation on the ground (MJ/m2/day)
}

//calcuting durnal variations of solar radition for each day
for(DOY=0; DOY<YearDays; DOY++) {
   if(Day_Length[DOY] > 0.01) {
      fprintf(fpt_Output, "%03d %5.2lf %5.2lf ", DOY+1, Day_Length[DOY], Daily_Solar_Rad[DOY]);
      Sun_Rise = 12-Day_Length[DOY]/2.0;
      Sun_Set  = 12+Day_Length[DOY]/2.0;

//estimating fraction of diffuse radiation in total solar radiation
// -- Users can directly use observations or better estimates if available.
      Rad_Avg = Daily_Solar_Rad[DOY]*1000000.0/(Day_Length[DOY] * 3600.0);  //mean solar radiation (w/m2)
      F = Rad_Avg/sFactors[DOY][3];
      if(F>0.9)    F = 0.9;
      else if(F<0) F = 0.0;

      if(F<=0.175) DayF_Diffuse=1.0;
      else {
//Parameters 1.05, -4.5, 8.6 may differ with time and location
         DayF_Diffuse = 1.05/(1+exp(-4.5 + 8.6*F));
         if(DayF_Diffuse>0.99) DayF_Diffuse = 0.99;
      }
      for(Time=0; Time<24.0; Time +=TimeStep) {
            if(Time>=Sun_Rise && Time<= Sun_Set) {
                  Rad_S = Slope_Solar_Rad(DOY, Time, Day_Length[DOY], sin_Lat, cos_Lat, cos_Slope, sin_Slope,
   cos_sFactors0[DOY], DayF_Diffuse, Rad_Avg, Slope, Aspect, ViewShed, ViewshedF_Diffuse, sFactors[DOY]);
            }
            else Rad_S = 0;
//output results
          fprintf(fpt_Output, "%7.2lf ", Rad_S);
```

```
      }   //Time loop
      fprintf(fpt_Output, "\n");
   }      //if Day_Length >0.01
}         //DOY loop

fclose(fpt_Input);
fclose(fpt_Output);
return 1;
}

void Integration_Factors_Etc(int DOY, double sin_Lat, double cos_Lat, double sFactors[], double DL_Rad0[])
{
 double S, C, AOB, Time, Step, SC, DS0, Dsinb;
 double Declination, Altitude0, Hour_Angle,
       sin_D, cos_D, sin_Altitude0,
      Alt_Noon, cos_Alt_Noon, Alt, cos_Alt;
 double Day_Length, SunRise, SunSet, Sum0, Sum1, Sum2, P0;
 int N;

 Declination = -23.44*RAD * cos (2.*Pi*(DOY+10.0)/365.25);
 sin_D = sin(Declination);
 cos_D = cos(Declination);

 S = sin_Lat*sin_D;
 C = cos_Lat*cos_D;

 AOB = S/C;
 if(AOB<-0.9999) {
    AOB = -0.9999;
    Day_Length = 0.0;
 }
 else if(AOB>0.9999) {
    AOB = 0.9999;
    Day_Length = 24.0;
 }
 else Day_Length = 12.0*(1.0+2.0*asin (AOB)/Pi);  //day length in hour

//daily solar constant (SC) and daily extraterrestrial radiation (DS0)
 if(Day_Length>0.001) {
     Dsinb  = 3600.0*(Day_Length*S+24.0*C*sqrt(1.-AOB*AOB)/Pi);
     SC  = 1350.0*(1.0+0.033*cos (2.0*Pi*DOY/365.25));
     DS0 = SC*Dsinb/1000000.0;  //daily extra-terrestrial solar radiation: MJ/m2/day

    Hour_Angle = 0.0;    //at noon
    sin_Altitude0 = S+C;
    Altitude0 = asin(sin_Altitude0);
```

```
    if(Altitude0<0) Altitude0 = 0;
    Alt_Noon = Pi/2 - Altitude0;  //zenith angle
    cos_Alt_Noon = cos(Alt_Noon);

    SunRise = 12.0 - Day_Length/2;
    SunSet  = 12.0 + Day_Length/2;

    Time = 0;
    N = 0;
    Step = 5.0/60.0;  //Time-step(in hour) for the integration (5 minutes)

    Sum0 = 0;
    Sum1 = 0;
    Sum2 = 0;
    for(Time=SunRise+Step; Time<SunSet; Time += Step) {
       Hour_Angle = 2*Pi*(Time-12.0)/24.0;
       sin_Altitude0 = S+C*cos(Hour_Angle);

       cos_Alt = sin_Altitude0;
       if(cos_Alt > 0) {
             Sum0 += cos_Alt;
             Altitude0 = asin(cos_Alt);
             Alt = Pi/2 - Altitude0;
             P0 = cos((Alt - Alt_Noon)/(Pi/2-Alt_Noon)*Pi/2);
             Sum1 +=  P0 * cos_Alt /cos_Alt_Noon;  //direct ratio
             Sum2 +=  P0;  //diffuse ratio
             N++;
       }
    }  //Time loop
    if(Alt_Noon>89.0*Pi/180.0) Alt_Noon  = 89.0*Pi/180.0;
    sFactors[0] = Alt_Noon;  //solar altitude at noon
    sFactors[1] = 1/(Sum1 * Step/Day_Length);
    sFactors[2] = 1/(Sum2 * Step/Day_Length);
    sFactors[3] = SC * Sum0/N + 0.001;  //average solar radiation on the top of the atmosphere
 }
 else {
    DS0 = 0.0;
    sFactors[0] = 0.0;
    sFactors[1] = 0.0;
    sFactors[2] = 0.0;
    sFactors[3] = 0.001;
 }
 DL_Rad0[0] = Day_Length;  //day length, hr
 DL_Rad0[1] = DS0;  //daily solar radiation at top of the atmosphere, MJ/m2/day
}
```

```
double Slope_Solar_Rad(int DOY, double Time, double Day_Length, double sin_Lat, double cos_Lat, double cos_Slope,
   double sin_Slope, double cos_sFactors0, double DayF_Diffuse, double Rad0, double Slope, double Aspect,
   double ViewShed[], double ViewshedF_Diffuse, double sFactors[])
{
   int k;
   double Direct_Rad, Diffuse_Rad;
   double Declination, sin_D, cos_D, S, C;
   double Hour_Angle, Altitude0, sin_Altitude0, cos_Altitude0, Zenith, Azimuth;
   double F, P0;

   Declination = -23.44*RAD * cos (2.*Pi*(DOY+10.0)/365.25);
   sin_D = sin(Declination);
   cos_D = cos(Declination);
   S = sin_Lat*sin_D;
   C = cos_Lat*cos_D;

   Hour_Angle = 2*Pi*(12.0-Time)/24.0;
   Altitude0 = asin(S+C*cos(Hour_Angle));
   Zenith = 0.5*Pi - Altitude0;

   sin_Altitude0 = sin(Altitude0);
   cos_Altitude0 = cos(Altitude0);
   if(cos_Altitude0 <= 0.0001) cos_Altitude0 = 0.0001; //avoiding divided by 0
   P0 = cos(0.5*Pi*(Zenith - sFactors[0])/(0.5*Pi - sFactors[0]));

//Azimuth: North:0, clockwise
   F =(sin_Altitude0*sin_Lat-sin_D)/(cos_Altitude0*cos_Lat);
   if(F>0.99999 || F<-0.99999) F = 0.99999;

   if(Time<12.0) Azimuth = Pi - acos(F);
   else Azimuth = Pi + acos(F);

   k = int(Azimuth/(22.5*RAD));  //22.5: the step of azimth directions (360/16)
   if(Altitude0 > ViewShed[k]) {  //un-blocked
      Direct_Rad  = cos_Slope*sin_Altitude0 + sin_Slope*cos_Altitude0*cos(Azimuth-Aspect);
      if(Direct_Rad<0) Direct_Rad = 0;
   }  //if
   else Direct_Rad = 0;

   Direct_Rad  = Rad0 * sFactors[1] * P0 * (1-DayF_Diffuse) * Direct_Rad/cos_sFactors0;
   Diffuse_Rad = Rad0 * sFactors[2] * P0 *    DayF_Diffuse  * ViewshedF_Diffuse;

 return Direct_Rad + Diffuse_Rad;
}
```

----------**The End of the code**----------

A sample input data file

(Users can save the input data into a text file (using the name 'Input.txt' and put directly under the code folder)
(The note lines and the note following the numbers have to be included as well)

----------Following is a same input data----------

```
A note line about the data
69.0           ..Latitude (degrees)
30.0           ..Slope (degrees)
180.0          ..Aspect (0-360 degrees, North 0, clockwise)
Viewshed (0 - 90 degrees) (lowest blocking angles in 16 directions beginning from north clockwise)
0.0    0.0    0.0    0.0    0.0    0.0    0.0    0.0    ..8 eastern directions (0,22.5,45,67.5,90,112.5,135,157.5)
30.0   30.0   30.0   0.0    0.0    0.0    0.0    0.0    ..8 western directions (180,202.5,225,247.5,270,292.5,315,337.5)
Daily maximum and minimum air temperature (degree C)
Year   Month  Date   Tmax   Tmin
1971   1      1      -23.3  -44.4
1971   1      2      -23.3  -44.7
1971   1      3      -22.2  -43.9
1971   1      4      -23.3  -32.2
1971   1      5      -16.7  -31.7
1971   1      6      -20.6  -24.4
1971   1      7      -21.1  -40.6
1971   1      8      -42.2  -43.3
1971   1      9      -47.8  -49.4
1971   1      10     -25.6  -50
1971   1      11     -25.6  -47.8
1971   1      12     -30.6  -33.3
1971   1      13     -41.1  -41.7
1971   1      14     -44.4  -47.8
1971   1      15     -50.6  -51.7
1971   1      16     -52.8  -55
1971   1      17     -48.3  -54.4
1971   1      18     -44.4  -53.9
1971   1      19     -46.1  -52.2
1971   1      20     -46.7  -50
1971   1      21     -40.6  -48.9
1971   1      22     -35    -47.2
1971   1      23     -36.7  -40.6
1971   1      24     -37.2  -40
1971   1      25     -39.4  -46.7
1971   1      26     -48.9  -52.8
1971   1      27     -50    -53.3
1971   1      28     -48.9  -53.3
1971   1      29     -46.1  -52.2
1971   1      30     -30    -51.2
1971   1      31     -30.6  -47.8
1971   2      1      -30.6  -38.3
1971   2      2      -29.4  -38.9
1971   2      3      -32.8  -32.8
1971   2      4      -42.8  -48.9
1971   2      5      -29.4  -48.9
1971   2      6      -24.4  -45
1971   2      7      -23.9  -31.1
1971   2      8      -23.3  -28.9
1971   2      9      -22.8  -27.8
1971   2      10     -28.9  -33.9
```

1971	2	11	-35.6	-45.6
1971	2	12	-26.1	-42.2
1971	2	13	-37.8	-46.7
1971	2	14	-33.3	-50
1971	2	15	-25.6	-48.9
1971	2	16	-25	-35
1971	2	17	-25	-36.7
1971	2	18	-11.1	-27.8
1971	2	19	-14.4	-36.1
1971	2	20	-13.9	-27.8
1971	2	21	-11.7	-26.45
1971	2	22	-9.4	-25
1971	2	23	-16.7	-21.7
1971	2	24	-28.3	-30
1971	2	25	-29.4	-37.2
1971	2	26	-32.8	-46.7
1971	2	27	-29.4	-46.7
1971	2	28	-27.2	-42.2
1971	3	1	-30	-40.6
1971	3	2	-30	-33.9
1971	3	3	-33.9	-48.3
1971	3	4	-30.6	-46.1
1971	3	5	-27.8	-38.3
1971	3	6	-27.8	-31.7
1971	3	7	-26.7	-32.2
1971	3	8	-25.6	-37.8
1971	3	9	-24.4	-42.2
1971	3	10	-20	-37.8
1971	3	11	-15.6	-31.7
1971	3	12	-12.8	-28.9
1971	3	13	-18.6	-34.7
1971	3	14	-24.4	-40.5
1971	3	15	-13.9	-30
1971	3	16	-12.8	-32.8
1971	3	17	-11.7	-31.1
1971	3	18	-8.3	-25
1971	3	19	-4.4	-23.9
1971	3	20	-11.7	-28.9
1971	3	21	-13.9	-29.4
1971	3	22	-11.7	-31.1
1971	3	23	-15.6	-25
1971	3	24	-14.4	-32.2
1971	3	25	-13.9	-32.2
1971	3	26	-13.9	-24.4
1971	3	27	-22.2	-35.6
1971	3	28	-20	-32.8
1971	3	29	-16.7	-37.2
1971	3	30	-16.1	-36.7
1971	3	31	-24.4	-29.4
1971	4	1	-26.7	-39.4
1971	4	2	-21.7	-36.1
1971	4	3	-18.3	-31.7
1971	4	4	-16.7	-22.2
1971	4	5	-16.1	-21.1
1971	4	6	-17.8	-21.1
1971	4	7	-18.9	-26.1
1971	4	8	-19.4	-35
1971	4	9	-18.3	-37.2

1971	4	10	-20	-26.1
1971	4	11	-13.3	-25.6
1971	4	12	-11.1	-22.2
1971	4	13	-3.3	-20
1971	4	14	-0.6	-16.7
1971	4	15	-12.2	-14.4
1971	4	16	-12.8	-17.2
1971	4	17	-5.6	-22.8
1971	4	18	-5	-25.6
1971	4	19	-2.8	-21.1
1971	4	20	-0.6	-12.2
1971	4	21	1.1	-20
1971	4	22	3.3	-17.8
1971	4	23	4.4	-10
1971	4	24	8.9	-1.7
1971	4	25	5.6	-4.4
1971	4	26	-6.7	-8.3
1971	4	27	-3.9	-15
1971	4	28	-5.6	-13.9
1971	4	29	-10	-16.1
1971	4	30	-6.1	-16.1
1971	5	1	-3.3	-15.6
1971	5	2	-2.2	-13.9
1971	5	3	-7.8	-15.6
1971	5	4	-5.6	-13.3
1971	5	5	-2.8	-11.1
1971	5	6	-2.2	-12.8
1971	5	7	-1.1	-8.3
1971	5	8	3.9	-10.6
1971	5	9	5.6	-6.7
1971	5	10	-0.6	-3.3
1971	5	11	3.9	-5
1971	5	12	5.6	-4.4
1971	5	13	3.3	-3.3
1971	5	14	4.4	-0.6
1971	5	15	3.9	0
1971	5	16	7.2	0.6
1971	5	17	8.3	-1.7
1971	5	18	8.9	0.6
1971	5	19	13.9	-0.6
1971	5	20	15.6	-1.1
1971	5	21	16.1	0.6
1971	5	22	12.8	2.8
1971	5	23	16.1	0
1971	5	24	11.1	-0.6
1971	5	25	13.3	-0.6
1971	5	26	16.1	-2.8
1971	5	27	16.1	5
1971	5	28	17.8	0
1971	5	29	15.6	6.1
1971	5	30	16.1	1.1
1971	5	31	17.8	1.7
1971	6	1	20.6	11.1
1971	6	2	14.4	5.6
1971	6	3	16.1	0
1971	6	4	19.4	4.4
1971	6	5	22.2	5.6
1971	6	6	23.3	7.8

1971	6	7	22.2	9.4
1971	6	8	24.4	10.6
1971	6	9	20.6	8.9
1971	6	10	11.1	0.6
1971	6	11	9.4	-2.2
1971	6	12	6.7	0.6
1971	6	13	9.4	-0.6
1971	6	14	18.9	-0.6
1971	6	15	21.7	4.4
1971	6	16	23.3	4.4
1971	6	17	24.4	10.6
1971	6	18	21.7	12.2
1971	6	19	22.8	8.3
1971	6	20	25.6	11.7
1971	6	21	27.8	4.4
1971	6	22	26.7	15
1971	6	23	26.1	15.6
1971	6	24	24.4	3.9
1971	6	25	22.8	9.4
1971	6	26	16.7	8.3
1971	6	27	15	5
1971	6	28	10	-0.6
1971	6	29	11.1	0.6
1971	6	30	15	2.2
1971	7	1	17.8	3.9
1971	7	2	18.9	6.7
1971	7	3	17.8	10
1971	7	4	18.3	4.4
1971	7	5	20	8.3
1971	7	6	23.3	6.1
1971	7	7	24.4	8.3
1971	7	8	27.2	8.3
1971	7	9	26.1	8.3
1971	7	10	26.35	11.1
1971	7	11	17.8	2.55
1971	7	12	18.3	5.6
1971	7	13	22.8	11.7
1971	7	14	28.05	12.8
1971	7	15	15	-0.25
1971	7	16	21.1	1.7
1971	7	17	21.1	3.3
1971	7	18	23.1	7.8
1971	7	19	20.6	5.3
1971	7	20	25	12.2
1971	7	21	18.9	13.9
1971	7	22	16.1	11.1
1971	7	23	20.6	4.4
1971	7	24	19.4	6.7
1971	7	25	21.1	11.1
1971	7	26	25.6	11.7
1971	7	27	22.2	8.3
1971	7	28	15.6	12.2
1971	7	29	18.3	6.7
1971	7	30	20	5.6
1971	7	31	20.2	9.4
1971	8	1	16.1	8.9
1971	8	2	19.4	8.9
1971	8	3	14.4	3.9

1971	8	4	13.3	2.8
1971	8	5	17.8	0.6
1971	8	6	20	-1.1
1971	8	7	12.8	5.6
1971	8	8	13.3	3.3
1971	8	9	14.4	6.7
1971	8	10	11.1	5
1971	8	11	16.1	2.2
1971	8	12	16.1	3.3
1971	8	13	6.1	0.6
1971	8	14	7.2	1.1
1971	8	15	12.2	3.9
1971	8	16	15.6	-1.7
1971	8	17	19.4	-1.1
1971	8	18	22.8	1.7
1971	8	19	23.3	8.9
1971	8	20	10	7.2
1971	8	21	10.6	3.3
1971	8	22	11.1	1.7
1971	8	23	7.2	1.1
1971	8	24	12.2	2.8
1971	8	25	16.7	1.7
1971	8	26	16.7	2.2
1971	8	27	19.4	2.2
1971	8	28	19.4	7.2
1971	8	29	15	-1.7
1971	8	30	4.4	2.8
1971	8	31	4.4	-1.1
1971	9	1	6.7	0.6
1971	9	2	5	0.6
1971	9	3	7.8	0.6
1971	9	4	3.3	0.6
1971	9	5	2.8	0
1971	9	6	4.4	1.1
1971	9	7	2.2	0
1971	9	8	0	-2.2
1971	9	9	2.2	-1.7
1971	9	10	5.6	0
1971	9	11	7.2	0
1971	9	12	7.2	0
1971	9	13	2.8	-1.7
1971	9	14	10	-4.4
1971	9	15	6.7	-3.3
1971	9	16	10	-1.1
1971	9	17	10.6	-0.6
1971	9	18	6.1	2.8
1971	9	19	10	1.1
1971	9	20	11.7	-5
1971	9	21	11.1	1.1
1971	9	22	8.3	-0.6
1971	9	23	11.1	-5
1971	9	24	9.4	-6.7
1971	9	25	6.7	-0.6
1971	9	26	5	0
1971	9	27	-1.1	-2.2
1971	9	28	1.7	-4.4
1971	9	29	-2.2	-7.8
1971	9	30	-2.2	-6.7

1971	10	1	-3.3	-6.1
1971	10	2	-1.7	-6.1
1971	10	3	-1.7	-4.4
1971	10	4	-4.4	-6.1
1971	10	5	-3.3	-7.8
1971	10	6	-2.8	-8.9
1971	10	7	-4.4	-10
1971	10	8	0	-8.9
1971	10	9	3.9	-4.4
1971	10	10	3.9	-6.7
1971	10	11	0	-8.3
1971	10	12	-3.3	-5.6
1971	10	13	-10	-11.7
1971	10	14	-10	-24.4
1971	10	15	-6.1	-21.1
1971	10	16	-1.1	-18.3
1971	10	17	-1.1	-11.1
1971	10	18	-3.3	-5.6
1971	10	19	-6.7	-7.8
1971	10	20	-12.2	-19.4
1971	10	21	-18.9	-23.3
1971	10	22	-13.3	-24.4
1971	10	23	-17.8	-22.8
1971	10	24	-18.3	-21.7
1971	10	25	-13.9	-26.1
1971	10	26	-3.9	-24.4
1971	10	27	-3.9	-22.2
1971	10	28	-4.4	-10.6
1971	10	29	-7.8	-9.4
1971	10	30	-9.4	-17.2
1971	10	31	-11.7	-16.1
1971	11	1	-12.2	-18.9
1971	11	2	-15	-21.1
1971	11	3	-13.9	-20.6
1971	11	4	-18.9	-28.9
1971	11	5	-25	-34.4
1971	11	6	-12.8	-33.9
1971	11	7	-13.9	-25.6
1971	11	8	-18.3	-19.4
1971	11	9	-22.2	-34.4
1971	11	10	-18.9	-34.4
1971	11	11	-16.1	-23.3
1971	11	12	-13.9	-21.7
1971	11	13	-16.1	-16.1
1971	11	14	-26.1	-30
1971	11	15	-27.8	-31.1
1971	11	16	-28.3	-32.8
1971	11	17	-19.4	-34.4
1971	11	18	-15	-33.9
1971	11	19	-15	-21.7
1971	11	20	-13.9	-22.2
1971	11	21	-13.9	-16.7
1971	11	22	-15.6	-20.6
1971	11	23	-22.8	-36.7
1971	11	24	-22.8	-37.8
1971	11	25	-35	-38.9
1971	11	26	-30	-42.2
1971	11	27	-20	-39.4

```
1971    11      28      -20     -34.4
1971    11      29      -22.8   -22.8
1971    11      30      -22.8   -26.1
1971    12      1       -22.2   -25.6
1971    12      2       -22.2   -28.3
1971    12      3       -22.8   -25
1971    12      4       -26.7   -31.1
1971    12      5       -35.6   -37.2
1971    12      6       -36.1   -41.1
1971    12      7       -24.4   -42.8
1971    12      8       -27.2   -42.2
1971    12      9       -41.1   -42.8
1971    12      10      -45.6   -46.7
1971    12      11      -43.3   -47.2
1971    12      12      -45     -47.2
1971    12      13      -45     -47.2
1971    12      14      -37.8   -46.7
1971    12      15      -25.6   -46.1
1971    12      16      -17.2   -37.8
1971    12      17      -17.2   -25.6
1971    12      18      -7.2    -23.3
1971    12      19      -22.8   -23.9
1971    12      20      -23.9   -32.2
1971    12      21      -31.7   -32.2
1971    12      22      -20     -46.1
1971    12      23      -20     -41.1
1971    12      24      -13.3   -30
1971    12      25      -7.2    -29.4
1971    12      26      -6.1    -13.3
1971    12      27      -11.1   -20.6
1971    12      28      -12.8   -18.3
1971    12      29      -12.8   -22.8
1971    12      30      -16.1   -18.9
1971    12      31      -12.2   -25
```

----------End of the input data----------

The output using the sample input data

The output file (with the name 'Output.txt') is in the code file folder.
Coloumn DOY: day of year. No output when day length is shorter than 0.01 hours.
Coloumn DL: day length in hours.
Coloumn Rad0: daily total solar radiation without topographic effects ($MJ/m^2/day$).
Coloumns 0.0 - 23.0: the calculated solar radiation (W/m^2) for the local time indicated by the first row.

----------The output using the sample input data----------

DOY	DL	Rad0	0.0	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0	21.0	22.0	23.0
017	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
018	1.18	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
019	1.59	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
020	1.93	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
021	2.23	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.56	1.40	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
022	2.50	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.49	5.58	2.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
023	2.75	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.57	5.00	3.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
024	2.98	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	161.65	7.94	6.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
025	3.21	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.93	9.11	7.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
026	3.42	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.32	9.02	7.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
027	3.63	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.24	12.58	11.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
028	3.83	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	120.39	14.83	13.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
029	4.02	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.97	697.93	2.04	1.89	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
030	4.21	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	92.13	668.81	2.10	1.97	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
031	4.40	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.94	253.58	15.74	14.88	4.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
032	4.58	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	127.64	395.81	11.43	10.89	4.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
033	4.76	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	1.83	1.91	1.83	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
034	4.94	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.73	147.39	23.92	23.08	12.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
035	5.11	1.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	372.86	749.48	3.20	3.10	1.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
036	5.28	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	414.59	768.86	3.46	3.37	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
037	5.45	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	139.92	239.55	25.75	25.13	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
038	5.62	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.43	121.41	31.57	30.89	21.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
039	5.78	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	60.08	90.02	32.93	32.29	23.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
040	5.94	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.97	93.86	34.79	34.18	25.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
041	6.11	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.97	332.39	489.51	16.40	16.15	12.59	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
042	6.27	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.98	521.86	751.76	4.45	4.38	3.50	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
043	6.43	1.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.28	299.01	417.89	23.88	23.57	19.26	4.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
044	6.58	2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	129.88	563.40	777.87	4.97	4.91	4.09	1.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
045	6.74	2.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	175.76	635.25	861.99	5.71	5.64	4.78	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
046	6.89	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123.01	382.50	508.49	21.54	21.32	18.30	7.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
047	7.05	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	168.06	471.80	620.52	14.29	14.15	12.31	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
048	7.20	3.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	236.89	612.01	797.06	5.83	5.78	5.08	2.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
049	7.35	3.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	283.21	679.81	875.77	6.61	6.56	5.82	3.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
050	7.51	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	254.61	573.30	730.78	9.66	9.58	8.59	4.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
051	7.66	3.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	282.40	603.21	762.27	9.08	9.02	8.15	4.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
052	7.81	3.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	309.83	632.41	792.97	8.05	8.00	7.27	4.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
053	7.96	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.57	105.27	122.77	60.31	59.95	54.87	35.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
054	8.10	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	14.46	21.35	23.19	23.32	23.19	21.35	14.46	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
055	8.25	2.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.06	173.47	306.13	369.83	49.70	49.44	45.75	31.92	16.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
056	8.40	4.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.33	357.23	635.81	776.29	11.79	11.73	10.91	7.81	45.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
057	8.55	5.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.12	415.34	722.06	877.68	8.20	8.16	7.62	5.59	68.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00
058	8.69	5.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	80.00	403.15	684.46	827.65	9.81	9.77	9.16	6.86	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
059	8.84	4.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	74.37	316.32	520.85	624.25	27.67	27.55	25.93	19.78	74.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
060	8.98	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.04	59.97	81.33	88.79	66.33	66.07	62.40	48.41	22.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
061	9.13	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	122.90	432.69	693.32	827.48	12.09	12.05	11.41	8.99	122.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
062	9.27	6.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	142.37	463.55	731.72	870.47	9.95	9.92	9.42	7.53	142.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00
063	9.41	5.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	118.42	349.54	537.26	633.52	33.30	33.18	31.61	25.58	118.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
064	9.56	2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.69	70.44	90.10	97.04	73.94	73.70	70.38	57.63	34.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
065	9.70	3.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.86	128.77	174.21	194.26	87.51	87.25	83.50	69.11	59.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
066	9.84	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	169.72	434.38	647.29	758.55	22.35	22.29	21.38	17.87	169.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
067	9.99	7.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	221.34	550.11	815.05	954.72	10.90	10.87	10.45	8.81	221.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00
068	10.13	8.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.86	234.10	560.31	821.73	960.02	11.15	11.12	10.71	9.11	234.10	6.86	0.00	0.00	0.00	0.00	0.00	0.00
069	10.27	8.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.00	236.85	547.78	795.66	927.23	11.13	11.10	10.70	9.18	236.85	14.00	0.00	0.00	0.00	0.00	0.00	0.00
070	10.41	8.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.47	248.00	555.74	799.84	929.80	12.05	12.02	11.61	10.03	248.00	21.47	0.00	0.00	0.00	0.00	0.00	0.00
071	10.55	8.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.13	261.06	568.87	811.99	941.87	11.76	11.73	11.35	9.87	261.06	29.13	0.00	0.00	0.00	0.00	0.00	0.00
072	10.69	9.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.86	273.37	580.43	822.00	951.46	11.78	11.75	11.38	9.96	273.37	36.86	0.00	0.00	0.00	0.00	0.00	0.00
073	10.83	9.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.30	282.87	586.24	823.99	951.79	12.11	12.08	11.72	10.31	282.87	44.30	0.00	0.00	0.00	0.00	0.00	0.00
074	10.97	10.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.08	317.05	642.63	896.91	1034.00	13.18	13.15	12.77	11.30	317.05	56.08	0.00	0.00	0.00	0.00	0.00	0.00
075	11.12	10.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.77	325.42	646.07	895.68	1030.63	13.32	13.30	12.93	11.49	325.42	63.77	0.00	0.00	0.00	0.00	0.00	0.00
076	11.26	10.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.03	318.01	619.28	853.10	979.86	12.84	12.82	12.47	11.14	318.01	68.03	0.00	0.00	0.00	0.00	0.00	0.00
077	11.40	11.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.76	345.43	660.65	904.61	1037.22	13.78	13.75	13.39	12.02	345.43	79.76	0.00	0.00	0.00	0.00	0.00	0.00
078	11.54	11.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	84.96	343.96	646.83	880.63	1008.04	13.56	13.54	13.20	11.89	343.96	84.96	0.00	0.00	0.00	0.00	0.00	0.00
079	11.68	11.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	89.29	339.19	627.08	848.63	969.62	15.25	15.22	14.86	13.44	339.19	89.29	0.00	0.00	0.00	0.00	0.00	0.00

080	11.82	12.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.04	379.54	692.14	932.31	1063.84	14.68	14.65	14.31	12.99	379.54	105.04	0.00	0.00	0.00	0.00	0.00	0.00
081	11.96	8.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	82.15	246.26	421.67	552.47	622.79	66.72	66.62	65.12	59.33	246.26	82.15	0.00	0.00	0.00	0.00	0.00	0.00
082	12.10	12.75	0.00	0.00	0.00	0.00	0.00	0.00	0.36	118.29	389.37	690.95	921.72	1048.68	14.81	14.79	14.47	13.23	389.37	118.29	0.36	0.00	0.00	0.00	0.00	0.00
083	12.24	13.23	0.00	0.00	0.00	0.00	0.00	0.00	1.18	127.41	402.70	705.72	937.16	1064.76	15.21	15.19	14.87	13.63	402.70	127.41	1.18	0.00	0.00	0.00	0.00	0.00
084	12.38	10.20	0.00	0.00	0.00	0.00	0.00	0.00	4.58	105.45	294.88	495.43	645.91	728.05	53.22	53.15	52.06	47.87	294.88	105.45	4.58	0.00	0.00	0.00	0.00	0.00
085	12.52	12.25	0.00	0.00	0.00	0.00	0.00	0.00	4.28	126.87	366.09	622.81	817.59	925.17	25.07	25.04	24.54	22.63	366.09	126.87	4.28	0.00	0.00	0.00	0.00	0.00
086	12.66	12.24	0.00	0.00	0.00	0.00	0.00	0.00	6.47	130.89	362.49	608.12	793.92	896.61	30.33	30.28	29.70	27.46	362.49	130.89	6.47	0.00	0.00	0.00	0.00	0.00
087	12.80	15.24	0.00	0.00	0.00	0.00	0.00	0.00	7.61	164.98	456.03	764.80	999.16	1129.43	16.84	16.82	16.51	15.30	456.03	164.98	7.61	0.00	0.00	0.00	0.00	0.00
088	12.94	15.64	0.00	0.00	0.00	0.00	0.00	0.00	9.88	173.26	465.74	773.54	1006.88	1136.81	17.13	17.10	16.80	15.60	465.74	173.26	9.88	0.00	0.00	0.00	0.00	0.00
089	13.08	6.21	0.00	0.00	0.00	0.00	0.00	0.00	26.70	83.78	139.88	183.54	210.01	221.97	139.18	139.01	136.57	127.12	139.88	83.78	26.70	0.00	0.00	0.00	0.00	0.00
090	13.22	13.51	0.00	0.00	0.00	0.00	0.00	0.00	15.58	157.57	392.22	633.67	815.43	916.63	32.03	31.99	31.45	29.34	392.22	157.57	15.58	0.00	0.00	0.00	0.00	0.00
091	13.36	14.75	0.00	0.00	0.00	0.00	0.00	0.00	17.09	173.69	429.79	692.89	891.33	1002.28	22.36	22.33	21.96	20.53	429.79	173.69	17.09	0.00	0.00	0.00	0.00	0.00
092	13.50	14.52	0.00	0.00	0.00	0.00	0.00	0.00	20.45	174.37	418.62	667.30	854.41	959.05	28.06	28.03	27.58	25.82	418.62	174.37	20.45	0.00	0.00	0.00	0.00	0.00
093	13.64	7.42	0.00	0.00	0.00	0.00	0.00	0.00	41.46	104.77	169.14	221.04	253.89	269.62	149.24	149.08	146.73	137.64	169.14	104.77	41.46	0.00	0.00	0.00	0.00	0.00
094	13.78	6.90	0.00	0.00	0.00	0.00	0.00	0.00	43.44	99.72	153.28	194.36	219.21	230.53	148.62	148.46	146.18	137.36	153.28	99.72	43.44	0.00	0.00	0.00	0.00	0.00
095	13.93	4.57	0.00	0.00	0.00	0.00	0.00	0.00	34.38	68.53	95.88	113.60	122.34	125.25	114.43	114.31	112.60	105.98	95.88	68.53	34.38	0.00	0.00	0.00	0.00	0.00
096	14.07	10.20	0.00	0.00	0.00	0.00	0.00	1.38	50.43	141.37	250.36	348.67	417.52	454.11	135.07	134.94	132.96	125.34	250.36	141.37	50.43	1.38	0.00	0.00	0.00	0.00
097	14.21	17.47	0.00	0.00	0.00	0.00	0.00	0.61	35.88	221.60	492.49	761.98	964.46	1078.77	19.62	19.60	19.32	18.24	492.49	221.60	35.88	0.61	0.00	0.00	0.00	0.00
098	14.35	19.16	0.00	0.00	0.00	0.00	0.00	0.99	41.85	245.12	537.38	826.94	1044.44	1167.41	19.21	19.19	18.92	17.89	537.38	245.12	41.85	0.99	0.00	0.00	0.00	0.00
099	14.50	9.36	0.00	0.00	0.00	0.00	0.00	11.24	63.27	137.09	214.93	280.11	323.39	345.37	158.66	158.51	156.34	148.00	214.93	137.09	63.27	11.24	0.00	0.00	0.00	0.00
100	14.64	16.34	0.00	0.00	0.00	0.00	0.00	3.80	48.27	215.37	444.32	667.18	833.41	927.19	42.39	42.35	41.78	39.61	444.32	215.37	48.27	3.80	0.00	0.00	0.00	0.00
101	14.78	15.57	0.00	0.00	0.00	0.00	0.00	6.31	53.84	208.74	415.27	614.11	761.64	844.67	58.45	58.40	57.64	54.70	415.27	208.74	53.84	6.31	0.00	0.00	0.00	0.00
102	14.93	19.51	0.00	0.00	0.00	0.00	0.00	2.41	54.76	257.30	533.07	801.70	1003.00	1117.36	19.18	19.17	18.92	17.98	533.07	257.30	54.75	2.41	0.00	0.00	0.00	0.00
103	15.07	19.45	0.00	0.00	0.00	0.00	0.00	3.28	58.68	258.46	526.70	786.74	981.37	1092.01	22.99	22.97	22.68	21.57	526.70	258.46	58.68	3.28	0.00	0.00	0.00	0.00
104	15.22	3.42	0.00	0.00	0.00	0.00	0.00	13.13	34.91	54.27	68.78	77.54	81.43	82.44	82.52	82.44	81.43	77.54	68.78	54.27	34.91	13.13	0.00	0.00	0.00	0.00
105	15.36	7.51	0.00	0.00	0.00	0.00	0.00	27.92	71.82	117.32	156.48	184.40	200.27	207.04	208.70	159.40	157.48	150.10	156.48	117.32	71.82	27.92	0.00	0.00	0.00	0.00
106	15.51	21.35	0.00	0.00	0.00	0.00	0.00	3.83	72.13	287.48	568.29	838.06	1039.87	1155.00	1191.03	20.08	19.85	18.94	568.29	287.48	72.13	3.83	0.00	0.00	0.00	0.00
107	15.66	23.07	0.00	0.00	0.00	0.00	0.00	4.42	81.08	311.93	610.12	895.69	1109.24	1231.18	1269.39	1231.18	21.29	20.33	610.12	311.93	81.08	4.42	0.00	0.00	0.00	0.00
108	15.80	22.52	0.00	0.00	0.00	0.00	0.00	4.59	82.14	305.62	591.73	864.92	1069.13	1185.85	1222.46	1185.85	20.64	19.73	591.73	305.62	82.14	4.59	0.00	0.00	0.00	0.00
109	15.95	18.04	0.00	0.00	0.00	0.00	0.00	14.73	83.30	250.61	457.58	651.94	795.77	877.41	902.91	877.41	62.39	59.68	457.58	250.61	83.30	14.73	0.00	0.00	0.00	0.00
110	16.10	24.20	0.00	0.00	0.00	0.00	0.25	5.46	94.42	330.45	627.64	909.84	1120.64	1241.35	1279.28	1241.35	21.87	20.94	627.64	330.45	94.42	5.46	0.25	0.00	0.00	0.00
111	16.25	24.48	0.00	0.00	0.00	0.00	0.61	5.77	98.50	335.14	630.83	910.86	1119.99	1239.84	1277.53	1239.84	21.97	21.05	630.83	335.14	98.50	5.77	0.61	0.00	0.00	0.00
112	16.40	21.13	0.00	0.00	0.00	0.00	1.64	10.40	93.97	292.13	535.91	765.19	935.82	1033.43	1064.11	1033.43	37.80	36.25	535.91	292.13	93.97	10.40	1.64	0.00	0.00	0.00
113	16.55	17.11	0.00	0.00	0.00	0.00	5.95	29.11	102.22	244.73	411.44	564.00	675.43	738.25	757.82	738.25	101.34	97.25	411.44	244.73	102.22	29.11	5.95	0.00	0.00	0.00
114	16.70	17.04	0.00	0.00	0.00	0.00	7.96	32.37	106.41	244.84	404.99	550.75	656.93	716.71	735.31	716.71	656.93	104.00	404.98	244.84	106.41	32.37	7.96	0.00	0.00	0.00
115	16.85	2.76	0.00	0.00	0.00	0.00	5.36	18.91	32.52	44.41	53.25	58.59	60.97	61.59	61.64	61.59	60.97	58.59	53.25	44.41	32.52	18.91	5.36	0.00	0.00	0.00
116	17.01	19.77	0.00	0.00	0.00	0.00	7.25	22.88	109.31	279.02	479.09	663.75	800.02	877.73	902.14	877.73	800.02	68.53	479.09	279.02	109.31	22.88	7.25	0.00	0.00	0.00
117	17.16	16.21	0.00	0.00	0.00	0.00	16.36	47.10	120.40	238.00	367.75	482.82	565.25	611.11	625.28	611.11	565.25	136.68	367.75	238.00	120.40	47.10	16.36	0.00	0.00	0.00
118	17.32	12.69	0.00	0.00	0.00	0.00	24.36	64.96	123.10	194.80	264.80	321.62	359.33	378.86	384.59	378.86	359.33	183.02	264.80	194.80	123.10	64.96	24.36	0.00	0.00	0.00
119	17.48	19.30	0.00	0.00	0.00	0.00	13.48	33.67	121.85	275.89	452.26	612.77	730.39	797.23	818.19	797.23	730.39	92.27	452.26	275.89	121.85	33.67	13.48	0.00	0.00	0.00
120	17.63	22.31	0.00	0.00	0.00	0.00	8.51	20.09	123.73	313.27	534.40	738.22	889.21	975.85	1003.19	975.85	889.21	53.64	534.40	313.27	123.73	20.09	8.51	0.00	0.00	0.00
121	17.79	21.83	0.00	0.00	0.00	0.00	10.84	24.37	127.09	307.91	516.94	708.74	850.49	931.74	957.36	931.74	850.49	63.50	516.94	307.91	127.09	24.37	10.84	0.00	0.00	0.00
122	17.95	16.60	0.00	0.00	0.00	0.00	28.06	60.42	136.51	245.46	361.72	463.06	535.01	574.88	587.17	574.88	535.01	153.85	361.72	245.46	136.51	60.42	28.06	0.00	0.00	0.00
123	18.12	16.51	0.00	0.00	0.00	1.53	30.89	64.01	139.59	244.86	356.10	452.50	520.67	558.33	569.92	558.33	520.67	159.50	356.10	244.86	139.59	64.01	30.89	1.53	0.00	0.00
124	18.28	17.63	0.00	0.00	0.00	3.29	29.91	59.88	141.70	258.76	384.56	495.00	574.02	618.15	631.84	618.15	574.02	146.17	384.56	258.76	141.70	59.88	29.91	3.29	0.00	0.00
125	18.45	21.49	0.00	0.00	0.00	3.02	18.50	35.91	140.80	305.61	491.11	659.22	782.76	853.40	875.67	853.40	782.76	659.22	491.11	305.61	140.80	35.91	18.50	3.02	0.00	0.00
126	18.61	15.86	0.00	0.00	0.00	8.49	40.49	76.43	147.49	237.57	329.14	406.46	460.06	489.17	498.02	489.17	460.06	406.46	329.14	237.57	147.49	76.43	40.49	8.49	0.00	0.00
127	18.78	26.12	0.00	0.00	0.00	2.30	9.19	16.91	151.11	364.37	607.92	831.11	996.87	1092.61	1122.99	1092.61	996.87	831.11	607.92	364.37	151.11	16.91	9.19	2.30	0.00	0.00
128	18.96	23.77	0.00	0.00	0.00	4.71	16.40	29.50	150.65	334.69	541.88	730.21	869.31	949.32	974.65	949.32	869.31	730.21	541.88	334.69	150.65	29.50	16.40	4.71	0.00	0.00
129	19.13	5.89	0.00	0.00	0.00	9.32	29.10	51.25	73.44	92.89	107.53	116.59	120.82	122.05	122.20	122.05	120.82	116.59	107.53	92.89	73.44	51.25	29.10	9.32	0.00	0.00
130	19.31	19.35	0.00	0.00	0.00	13.35	38.18	65.95	158.24	281.40	412.65	527.80	610.59	657.15	671.67	657.15	610.59	527.80	412.65	281.40	158.24	65.95	38.18	13.35	0.00	0.00
131	19.49	21.22	0.00	0.00	0.00	12.13	32.22	54.67	160.01	304.18	460.82	600.23	701.72	759.46	777.62	759.46	701.72	600.23	460.82	304.18	160.01	54.67	32.22	12.13	0.00	0.00
132	19.67	15.25	0.00	0.00	0.00	22.37	55.83	93.43	157.43	229.74	299.34	355.85	393.76	413.74	419.70	413.74	393.76	355.85	299.34	229.74	157.43	93.43	55.83	22.37	0.00	0.00
133	19.86	11.60	0.00	0.00	0.00	23.58	55.75	91.82	135.61	178.66	215.49	242.21	258.07	265.31	267.22	265.31	258.07	242.21	215.49	178.66	135.61	91.82	55.75	23.58	0.00	0.00
134	20.05	9.03	0.00	0.00	0.43	21.49	48.49	78.67	110.85	140.24	163.50	178.94	187.04	190.09	190.73	190.09	187.04	178.94	163.50	140.24	110.85	78.67	48.49	21.49	0.43	0.00
135	20.25	15.21	0.00	0.00	2.59	28.76	62.28	100.66	161.70	228.89	292.36	343.17	376.85	394.38	399.56	394.38	376.85	343.17	292.36	228.89	161.70	100.66	62.28	28.76	2.59	0.00
136	20.45	21.88	0.00	0.00	2.84	18.99	39.66	67.08	172.78	312.61	462.25	594.54	690.62	745.28	762.48	745.28	690.62	594.54	462.25	312.61	172.78	67.08	39.66	18.99	2.84	0.00
137	20.66	18.82	0.00	0.00	5.66	28.15	56.92	92.16	174.64	275.25	377.73	465.12	526.69	560.77	571.30	560.77	526.69	465.12	377.73	275.25	174.64	92.16	56.92	28.15	5.66	0.00
138	20.88	27.50	0.00	0.00	2.33	9.47	18.61	38.63	182.33	382.28	602.62	801.64	948.95	1034.20	1061.33	1034.20	948.95	801.64	602.62	382.28	182.33	38.63	18.61	9.47	2.33	0.00
139	21.10	29.62	0.00	0.00	2.00	7.02	13.44	33.13	189.98	409.27	651.67	871.22	1034.17	1128.72	1158.87	1128.72	1034.17	871.22	651.67	409.27	189.98	33.13	13.44	7.02	2.00	0.00
140	21.34	28.54	0.00	0.00	2.99	9.37	17.52	39.72	188.88	395.15	621.94	826.74	978.47	1066.40	1094.41	1066.40	978.47	826.74	621.94	395.15	188.88	39.72	17.52	9.37	2.99	0.00
141	21.60	21.91	0.00	0.00	9.53	27.25	49.85	82.84	183.85	312.73	448.09	566.50	651.98	700.43	715.64	700.43	651.98	566.50	448.09	312.73	183.85	82.84	49.85	27.25	9.53	0.00
142	21.88	29.66	0.00	0.00	3.46	9.18	16.47	41.15	196.13	409.16	642.88	853.87	1010.31	1101.09	1130.03	1101.09	1010.31	853.87	642.88	409.16	196.13	41.15	16.47	9.18	3.46	0.00
143	22.19	25.54	0.00	0.45	7.78	19.37	34.13	63.92	189.82	357.01	537.02	697.51	815.34	883.17	904.68	883.17	815.34	697.51	537.02	357.01	189.82	63.92	34.13	19.37	7.78	0.45
144	22.55	28.34	0.00	0.79	5.70	13.44	23.31	51.80	196.45	391.87	604.42	795.39	936.56	1018.31	1044.36	1018.31	936.56	795.39	604.42	391.87	196.45	51.80	23.31	13.44	5.70	0.79
145	23.02	32.92	0.00	0.58	2.82	6.36	10.86	39.43	212.99	450.73	711.44	947.11	1122.27	1224.21	1256.79	1224.21	1122.27	947.11	711.44	450.73	212.99	39.43	10.86	6.36	2.82	0.58
146	24.00	23.91	0.12	3.45	13.18	28.53	48.08	83.04	194.08	336.29	486.34	618.39	714.42	769.26	786.58	769.26	714.42	618.39	486.34	336.29	194.08	83.04	48.08	28.53	13.18	3.45
147	24.00	32.17	0.29	1.24	4.02	8.41	14.00	45.45	213.01	440.19	688.11	911.69	1077.70	1174.27	1205.13	1174.27	1077.70	911.69	688.11	440.19	213.01	45.45	14.00	8.41	4.02	1.24
148	24.00	21.48	2.47	6.83	19.61	39.76	65.38	104.15	195.21	305.86	418.86	515.95	585.16	623.99	636.10	623.99	585.16	515.95	418.86	305.86	195.21	104.15	65.38	39.76	19.61	6.83
149	24.00	30.15	1.18	2.63	6.86	13.54	22.02	56.17	209.21	413.52	634.72	833.29	980.28	1065.60	1092.82	1065.60	980.28	833.29	634.72	413.52	209.21	56.17	22.02	13.54	6.86	2.63
150	24.00	31.10	1.35	2.62	6.35	12.23	19.70	54.97	213.54	425.34	654.78	860.93	1013.69	1102.46	1130.81	1102.46	1013.69	860.93	654.78	425.34	213.54	54.97	19.70	12.23	6.35	2.62
151	24.00	20.05	6.32	11.22	25.56	48.14	76.83	117.41	195.86	287.01	377.30	453.13	506.10	535.27	544.25	535.27	506.10	453.13	377.30	287.01	195.86	117.41	76.83	48.14	25.56	11.22
152	24.00	20.96	7.06	11.74	25.40	46.91	74.24	114.98	198.97	298.15	397.59	481.94	541.44	574.51	584.76	574.51	541.44	481.94	397.59	298.15	198.97	114.98	74.24	46.91	25.40	11.74
153	24.00	32.19	2.00	3.16	6.55	11.89	18.66	57.43	221.05	438.37	673.29	884.26	1040.69	1131.69	1160.77	1131.69	1040.69	884.26	673.29	438.37	221.05	57.43	18.66	11.89	6.55	3.16
154	24.00	29.92	3.30	5.02	10.03	17.91	27.93	67.27	215.14	409.05	617.16	803.18	940.61	1020.31	1045.73	1020.31	940.61	803.18	617.16	409.05	215.14	67.27	27.93	17.91	10.03	5.02
155	24.00	30.88	3.20	4.70	9.11	16.04	24.84	65.20	218.95	420.99	638.14	832.51	976.30	1059.82	1086.48	1059.82	976.30	832.51	638.14	420.99	218.95	65.20	24.84	16.04	9.11	4.70
156	24.00	29.17	4.59	6.59	12.41	21.58	33.21	74.15	215.53	399.10	595.07	769.67	898.38	972.91	996.66	972.91	898.38	769.67	595.07	399.10	215.53	74.15	33.21	21.58	12.41	6.59
157	24.00	25.91	7.69	10.80	19.87	34.14	52.24	94.01	211.04	358.36	512.71	648.38	747.27	803.97	821.92	803.97	747.27	648.38	512.71	358.36	211.04	94.01	52.24	34.14	19.87	10.80
158	24.00	26.45	7.78	10.73	19.34	32.87	50.05	92.28	212.70	364.80	524.52	665.18	767.91	826.92	845.62	826.92	767.91	665.18	524.52	364.80	212.70	92.28	50.05	32.87	19.34	10.73
159	24.00	25.02	9.75	13.24	23.44	39.48	59.82	102.59	211.69	346.86	487.09	609.51	698.25	748.88	764.85	748.88	698.25	609.51	487.09	346.86	211.69	102.59	59.82	39.48	23.44	13.24
160	24.00	26.16	9.12	12.23	21.31	35.58	53.68	96.85	213.99	360.81	514.32	649.12	747.36	803.70	821.54	803.70	747.36	649.12	514.32	360.81	213.99	96.85	53.68	35.58	21.31	12.23
161	24.00	28.67	7.03	9.32	16.01	26.53	39.87	83.76	218.88	391.83	575.05	737.58	857.08	926.15	948.14	926.15	857.08	737.58	575.05	391.83	218.88	83.76	39.87	26.53	16.01	9.32
162	24.00	16.97	16.92	22.22	37.71	62.06	92.92	132.19	186.73	243.70	295.68	336.34	362.83	376.41	380.37	376.41	362.83	336.34	295.68	243.70	186.73	132.19	92.92	62.06	37.71	22.22
163	24.00	25.81	10.90	14.20	23.84	39.00	58.21	102.40	215.52	355.95	501.94	629.68	722.52	775.64	792.43	775.64	722.52	629.68	501.94	355.95	215.52	102.40	58.21	39.00	23.84	14.20

164	24.00	36.06	2.56	3.32	5.52	8.98	13.37	63.05	245.73	485.57	743.71	975.48	1147.68	1248.15	1280.34	1248.15	1147.68	975.48	743.71	485.57	245.73	63.05	13.37	8.98	5.52	3.32
165	24.00	32.96	4.43	5.70	9.40	15.22	22.60	70.23	233.21	445.27	672.33	875.44	1025.92	1113.50	1141.51	1113.50	1025.92	875.44	672.33	445.27	233.21	70.23	22.60	15.22	9.40	5.70
166	24.00	34.01	3.86	4.94	8.10	13.07	19.36	68.14	237.61	458.61	695.59	907.85	1065.27	1156.98	1186.33	1156.98	1065.27	907.85	695.59	458.61	237.61	68.14	19.36	13.07	8.10	4.94
167	24.00	27.09	10.60	13.52	22.03	35.41	52.36	97.80	219.23	371.35	530.47	670.42	772.64	831.40	850.03	831.40	772.64	670.42	530.47	371.35	219.23	97.80	52.36	35.41	22.03	13.52
168	24.00	20.78	18.09	22.99	37.29	59.76	88.23	131.33	206.87	292.61	376.38	446.14	494.62	521.22	529.38	521.22	494.62	446.14	376.38	292.61	206.87	131.33	88.23	59.76	37.29	22.99
169	24.00	29.05	8.59	10.89	17.60	28.14	41.50	87.98	223.36	395.50	577.32	738.42	856.84	925.30	947.10	925.30	856.84	738.42	577.32	395.50	223.36	87.98	41.50	28.14	17.60	10.89
170	24.00	26.64	11.67	14.77	23.81	38.00	55.98	101.68	219.23	365.53	517.95	651.63	749.05	804.94	822.64	804.94	749.05	651.63	517.95	365.53	219.23	101.68	55.98	38.00	23.81	14.77
171	24.00	36.01	3.04	3.84	6.18	9.85	14.50	66.16	247.28	483.97	738.16	966.15	1135.51	1234.32	1265.98	1234.32	1135.51	966.15	738.16	483.97	247.28	66.16	14.50	9.85	6.18	3.84
172	24.00	22.25	17.30	21.84	35.10	55.94	82.33	126.45	211.62	311.03	410.17	494.19	553.54	586.64	596.92	586.64	553.54	494.19	410.17	311.03	211.62	126.45	82.33	55.94	35.10	21.84
173	24.00	20.38	18.97	23.95	38.48	61.32	90.24	133.11	205.75	287.37	366.51	432.01	477.25	501.93	509.48	501.93	477.25	432.01	366.51	287.37	205.75	133.11	90.24	61.32	38.48	23.95
174	24.00	35.18	3.48	4.39	7.07	11.27	16.59	67.49	243.59	473.31	719.77	940.67	1104.65	1200.28	1230.90	1200.28	1104.65	940.67	719.77	473.31	243.59	67.49	16.59	11.27	7.07	4.39
175	24.00	27.39	10.71	13.54	21.81	34.81	51.27	97.23	220.39	374.82	536.50	678.83	782.88	842.74	861.74	842.74	782.88	678.83	536.50	374.82	220.39	97.23	51.27	34.81	21.81	13.54
176	24.00	20.47	18.57	23.53	37.99	60.72	89.52	132.42	205.86	288.65	369.10	435.81	481.97	507.20	514.92	507.20	481.97	435.81	369.10	288.65	205.86	132.42	89.52	60.72	37.99	23.53
177	24.00	24.48	14.15	17.97	29.13	46.65	68.85	113.69	215.49	339.00	465.53	575.06	653.95	698.74	712.82	698.74	653.95	575.06	465.53	339.00	215.49	113.69	68.85	46.65	29.13	17.97
178	24.00	27.05	10.66	13.58	22.11	35.51	52.49	97.92	219.05	370.73	529.37	668.88	770.76	829.32	847.89	829.32	770.76	668.88	529.37	370.73	219.05	97.92	52.49	35.51	22.11	13.58
179	24.00	26.54	11.05	14.14	23.14	37.28	55.20	100.30	217.88	364.50	517.40	651.58	749.36	805.47	823.24	805.47	749.36	651.58	517.40	364.50	217.88	100.30	55.20	37.28	23.14	14.14
180	24.00	29.43	7.48	9.61	15.83	25.60	37.99	83.73	222.72	400.51	588.91	756.19	879.34	950.62	973.33	950.62	879.34	756.19	588.91	400.51	222.72	83.73	37.99	25.60	15.83	9.61
181	24.00	30.07	6.60	8.53	14.16	23.01	34.23	79.90	223.77	408.74	605.36	780.30	909.30	984.08	1007.93	984.08	909.30	780.30	605.36	408.74	223.77	79.90	34.23	23.01	14.16	8.53
182	24.00	26.89	9.66	12.57	21.05	34.38	51.27	95.64	216.90	369.26	528.87	669.33	771.95	830.92	849.63	830.92	771.95	669.33	528.87	369.26	216.90	95.64	51.27	34.38	21.05	12.57
183	24.00	18.44	16.84	22.07	37.34	61.36	91.80	132.71	195.27	263.08	326.94	378.40	412.99	431.34	436.83	431.34	412.99	378.40	326.94	263.08	195.27	132.71	91.80	61.36	37.34	22.07
184	24.00	29.64	6.16	8.14	13.94	23.07	34.63	78.82	220.82	403.75	598.33	771.45	899.06	972.99	996.55	972.99	899.06	771.45	598.33	403.75	220.82	78.82	34.63	23.07	13.94	8.14
185	24.00	25.33	10.04	13.42	23.30	38.83	58.52	101.65	212.62	350.38	493.53	618.67	709.51	761.42	777.81	761.42	709.51	618.67	493.53	350.38	212.62	101.65	58.52	38.83	23.30	13.42
186	24.00	31.55	4.10	5.55	9.78	16.43	24.86	68.59	224.62	428.32	646.67	841.94	986.45	1070.44	1097.27	1070.44	986.45	841.94	646.67	428.32	224.62	68.59	24.86	16.43	9.78	5.55
187	24.00	29.58	5.14	7.06	12.66	21.47	32.65	75.09	218.24	403.69	601.50	777.74	907.72	983.04	1007.06	983.04	907.72	777.74	601.50	403.69	218.24	75.09	32.65	21.47	12.66	7.06
188	24.00	31.20	3.71	5.19	9.49	16.27	24.86	67.03	221.77	424.35	641.75	836.25	980.16	1063.78	1090.48	1063.78	980.16	836.25	641.75	424.35	221.77	67.03	24.86	16.27	9.49	5.19
189	24.00	30.46	3.81	5.43	10.17	17.62	27.08	68.26	218.60	415.20	626.00	814.42	953.70	1034.54	1060.34	1034.54	953.70	814.42	626.00	415.20	218.60	68.26	27.08	17.62	10.17	5.43
190	24.00	27.03	5.65	8.25	15.87	27.85	43.06	83.43	210.16	372.46	544.26	696.35	807.83	872.07	892.46	872.07	807.83	696.35	544.26	372.46	210.16	83.43	43.06	27.85	15.87	8.25
191	24.00	30.74	2.93	4.42	8.75	15.58	24.24	63.78	217.26	419.33	636.72	831.37	975.40	1059.05	1085.75	1059.05	975.40	831.37	636.72	419.33	217.26	63.78	24.24	15.58	8.75	4.42
192	24.00	26.85	4.58	7.16	14.71	26.58	41.66	80.62	207.45	370.66	543.80	697.22	809.73	874.54	895.13	874.54	809.73	697.22	543.80	370.66	207.45	80.62	41.66	26.58	14.71	7.16
193	24.00	22.09	6.69	10.96	23.44	43.10	68.07	108.40	200.59	312.06	425.68	523.32	593.02	632.20	644.44	632.20	593.02	523.32	425.68	312.06	200.59	108.40	68.07	43.10	23.44	10.96
194	24.00	25.43	4.02	7.01	15.75	29.51	47.00	85.00	202.94	353.57	512.54	652.77	755.14	813.87	832.46	813.87	755.14	652.77	512.54	353.57	202.94	85.00	47.00	29.51	15.75	7.01
195	24.00	30.89	1.45	2.74	6.53	12.51	20.10	55.51	212.70	422.40	649.44	853.36	1004.44	1092.23	1120.26	1092.23	1004.44	853.36	649.44	422.40	212.70	55.51	20.10	12.51	6.53	2.74
196	24.00	32.88	0.78	1.66	4.25	8.33	13.52	47.98	218.60	448.53	698.82	924.38	1091.91	1189.43	1220.60	1189.43	1091.91	924.38	698.82	448.53	218.60	47.98	13.52	8.33	4.25	1.66
197	24.00	31.21	0.72	1.86	5.21	10.49	17.21	50.18	210.93	427.24	662.41	874.07	1031.05	1122.30	1151.44	1122.30	1031.05	874.07	662.41	427.24	210.93	50.18	17.21	10.49	5.21	1.86
198	24.00	27.42	0.77	2.84	8.89	18.44	30.59	63.48	199.36	379.22	572.86	745.86	873.33	947.01	970.45	947.01	873.33	745.86	572.86	379.22	199.36	63.48	30.59	18.44	8.89	2.84
199	24.00	28.25	0.18	1.94	7.09	15.21	25.54	56.73	199.29	389.96	596.38	781.44	918.14	997.30	1022.51	997.30	918.14	781.44	596.38	389.96	199.29	56.73	25.54	15.21	7.09	1.94
200	23.18	22.55	0.00	3.12	14.12	31.49	53.60	89.15	191.08	319.58	453.82	571.03	655.68	703.72	718.81	703.72	655.68	571.03	453.82	319.58	191.08	89.15	53.60	31.49	14.12	3.12
201	22.65	10.12	0.00	2.44	15.54	36.22	62.57	92.19	123.97	153.08	176.29	191.88	200.22	203.47	204.17	203.47	200.22	191.88	176.29	153.08	123.97	92.19	62.57	36.22	15.54	2.44
202	22.27	10.73	0.00	1.19	14.98	36.76	64.53	95.85	130.38	162.51	188.59	206.49	216.37	220.42	221.36	220.42	216.37	206.49	188.59	162.51	130.38	95.85	64.53	36.76	14.98	1.19
203	21.95	28.24	0.00	0.00	4.44	11.59	20.70	46.43	192.06	390.71	607.74	803.15	947.74	1031.51	1058.19	1031.51	947.74	803.15	607.74	390.71	192.06	46.43	20.70	11.59	4.44	0.00
204	21.67	24.11	0.00	0.00	7.32	20.49	37.31	66.46	183.93	339.28	505.98	654.10	762.47	824.61	844.28	824.61	762.47	654.10	505.98	339.28	183.93	66.46	37.31	20.49	7.32	0.00
205	21.41	18.99	0.00	0.00	10.95	33.47	62.21	98.88	179.64	276.60	374.47	457.51	515.84	548.08	558.02	548.08	515.84	457.51	374.47	276.60	179.64	98.88	62.21	33.47	10.95	0.00
206	21.16	22.66	0.00	0.00	6.44	21.93	41.72	71.20	179.68	321.83	473.39	607.30	704.69	760.23	777.73	760.23	704.69	607.30	473.39	321.83	179.68	71.20	41.72	21.93	6.44	0.00
207	20.93	24.00	0.00	0.00	4.25	16.61	32.40	57.76	177.24	338.20	512.50	668.08	782.15	847.63	868.35	847.63	782.15	668.08	512.50	338.20	177.24	57.76	32.40	16.61	4.25	0.00
208	20.71	6.65	0.00	0.00	4.19	19.70	39.53	61.61	83.67	102.96	117.49	126.51	130.74	131.99	132.13	131.99	130.74	126.51	117.49	102.96	83.67	61.61	39.53	19.70	4.19	0.00
209	20.50	21.85	0.00	0.00	3.08	18.88	39.11	66.27	171.94	311.83	461.62	594.11	690.40	745.22	762.48	745.22	690.40	594.11	461.62	311.83	171.94	66.27	39.11	18.88	3.08	0.00
210	20.30	24.75	0.00	0.00	1.18	11.17	23.97	43.32	170.62	347.53	542.02	717.08	846.08	920.37	943.93	920.37	846.08	717.08	542.02	347.53	170.62	43.32	23.97	11.17	1.18	0.00
211	20.10	19.56	0.00	0.00	0.80	20.64	46.07	76.57	167.51	283.95	406.04	512.26	588.30	630.98	644.28	630.98	588.30	512.26	406.04	283.95	167.51	76.57	46.07	20.64	0.80	0.00
212	19.91	14.34	0.00	0.00	0.00	25.22	58.91	96.97	154.70	217.26	275.59	321.70	351.82	367.28	371.78	367.28	351.82	321.70	275.59	217.26	154.70	96.97	58.91	25.22	0.00	0.00
213	19.72	18.98	0.00	0.00	0.00	17.98	44.24	74.28	162.97	276.78	396.14	499.85	573.90	615.35	628.23	615.35	573.90	499.85	396.14	276.78	162.97	74.28	44.24	17.98	0.00	0.00
214	19.53	20.23	0.00	0.00	0.00	13.81	36.07	61.03	159.66	291.81	433.84	559.33	650.15	701.56	717.67	701.56	650.15	559.33	433.84	291.81	159.66	61.03	36.07	13.81	0.00	0.00
215	19.35	20.27	0.00	0.00	0.00	11.95	33.49	57.59	156.68	292.09	438.51	568.30	662.43	715.79	732.53	715.79	662.43	568.30	438.51	292.09	156.68	57.59	33.49	11.95	0.00	0.00
216	19.17	26.55	0.00	0.00	0.00	3.30	10.06	17.64	157.50	369.94	610.73	830.80	994.20	1088.68	1118.70	1088.68	994.20	830.80	610.73	369.94	157.50	17.64	10.06	3.30	0.00	0.00
217	19.00	28.35	0.00	0.00	0.00	1.86	6.28	11.24	160.29	393.57	660.04	904.55	1086.52	1191.88	1225.37	1191.88	1086.52	904.55	660.04	393.57	160.29	11.24	6.28	1.86	0.00	0.00
218	18.83	14.14	0.00	0.00	0.00	12.03	46.24	84.60	145.33	215.20	282.29	336.46	372.50	391.30	396.85	391.30	372.50	336.46	282.29	215.20	145.33	84.60	46.24	12.03	0.00	0.00
219	18.66	18.61	0.00	0.00	0.00	6.90	31.31	58.73	146.66	271.14	405.52	524.09	609.48	657.50	672.47	657.50	609.48	524.09	405.52	271.14	146.66	58.73	31.31	6.90	0.00	0.00
220	18.49	14.38	0.00	0.00	0.00	7.21	41.12	79.25	142.38	218.24	292.67	353.75	394.97	416.77	423.27	416.77	394.97	353.75	292.67	218.24	142.38	79.25	41.12	7.21	0.00	0.00
221	18.32	11.85	0.00	0.00	0.00	4.92	39.66	78.76	129.44	183.83	233.01	270.56	294.09	305.57	308.78	305.57	294.09	191.32	233.01	183.83	129.44	78.76	39.66	4.92	0.00	0.00
222	18.16	22.15	0.00	0.00	0.00	0.85	13.05	26.80	133.93	312.67	517.13	703.99	841.98	921.14	946.13	921.14	841.98	66.43	517.13	312.67	133.93	26.80	13.05	0.85	0.00	0.00
223	17.99	20.67	0.00	0.00	0.00	0.00	15.41	32.86	131.00	294.10	479.62	648.39	772.46	843.31	865.61	843.31	772.46	83.20	479.62	294.10	131.00	32.86	15.41	0.00	0.00	0.00
224	17.83	10.87	0.00	0.00	0.00	0.00	31.98	71.10	119.03	169.85	215.06	248.95	269.73	279.60	282.29	279.60	269.73	184.16	215.06	169.85	119.03	71.10	31.98	0.00	0.00	0.00
225	17.67	11.77	0.00	0.00	0.00	0.00	30.09	70.15	122.90	182.48	237.82	280.98	308.55	322.29	326.20	322.29	308.55	186.13	237.82	182.48	122.90	70.15	30.09	0.00	0.00	0.00
226	17.52	14.68	0.00	0.00	0.00	0.00	24.73	60.88	127.69	220.34	316.87	399.35	456.78	487.97	497.45	487.97	456.78	165.72	316.87	220.34	127.69	60.88	24.73	0.00	0.00	0.00
227	17.36	23.61	0.00	0.00	0.00	0.00	4.39	11.50	118.09	328.49	578.42	810.78	983.67	1083.11	1114.53	1083.11	983.67	32.16	578.42	328.49	118.09	11.50	4.39	0.00	0.00	0.00
228	17.20	24.41	0.00	0.00	0.00	0.00	2.96	8.37	116.35	338.24	604.13	852.27	1037.20	1143.62	1177.25	1143.62	1037.20	24.09	604.13	338.24	116.35	8.37	2.96	0.00	0.00	0.00
229	17.05	23.60	0.00	0.00	0.00	0.00	2.95	9.09	111.39	327.03	586.56	829.05	1009.70	1113.55	1146.33	1113.55	1009.70	27.00	586.56	327.03	111.39	9.09	2.95	0.00	0.00	0.00
230	16.89	18.35	0.00	0.00	0.00	0.00	8.03	27.52	107.45	261.11	440.80	605.70	726.76	795.44	816.94	795.44	726.76	84.51	440.80	261.11	107.45	27.52	8.03	0.00	0.00	0.00
231	16.74	4.46	0.00	0.00	0.00	0.00	7.64	29.89	52.25	71.80	86.35	95.13	99.05	100.07	100.15	100.07	99.05	95.13	86.35	71.80	52.25	29.89	7.64	0.00	0.00	0.00
232	16.59	12.18	0.00	0.00	0.00	0.00	11.06	51.39	108.93	185.62	263.05	327.24	370.46	393.08	399.77	393.08	370.46	169.97	263.05	185.62	108.93	51.39	11.06	0.00	0.00	0.00
233	16.44	14.92	0.00	0.00	0.00	0.00	6.34	37.30	103.20	218.04	347.55	463.32	546.27	592.25	606.40	592.25	134.09	128.60	347.55	218.04	103.20	37.30	6.34	0.00	0.00	0.00
234	16.29	10.30	0.00	0.00	0.00	0.00	5.66	47.63	98.99	159.68	216.88	261.65	290.09	304.08	308.02	304.08	179.25	171.79	216.88	159.68	98.99	47.63	5.66	0.00	0.00	0.00
235	16.14	14.27	0.00	0.00	0.00	0.00	2.09	34.31	97.16	208.50	334.60	447.31	527.82	572.24	585.86	572.24	135.67	129.93	334.60	208.50	97.16	34.31	2.09	0.00	0.00	0.00
236	15.99	18.79	0.00	0.00	0.00	0.00	0.00	12.11	82.63	259.64	479.97	687.65	841.81	929.56	957.02	929.56	50.56	48.38	479.97	259.64	82.63	12.11	0.00	0.00	0.00	0.00
237	15.84	18.08	0.00	0.00	0.00	0.00	0.00	12.20	78.85	249.74	463.50	665.23	814.83	899.83	926.39	899.83	54.05	51.67	463.50	249.74	78.85	12.20	0.00	0.00	0.00	0.00
238	15.69	19.10	0.00	0.00	0.00	0.00	0.00	7.94	74.24	260.65	498.38	724.65	893.20	989.18	1019.20	989.18	37.57	35.88	498.38	260.65	74.24	7.94	0.00	0.00	0.00	0.00
239	15.55	14.92	0.00	0.00	0.00	0.00	0.00	19.30	77.99	210.48	371.77	521.28	630.37	691.38	710.23	99.35	98.18	93.70	371.77	210.48	77.99	19.30	0.00	0.00	0.00	0.00
240	15.40	18.91	0.00	0.00	0.00	0.00	0.00	5.89	66.61	255.40	501.40	737.33	913.39	1013.53	1044.80	32.89	32.49	30.98	501.40	255.40	66.61	5.89	0.00	0.00	0.00	0.00
241	15.25	2.10	0.00	0.00	0.00	0.00	0.00	8.24	21.52	33.32	42.16	47.49	49.87	50.48	50.53	50.48	49.87	47.49	42.16	33.32	21.52	8.24	0.00	0.00	0.00	0.00
242	15.11	8.29	0.00	0.00	0.00	0.00	0.00	24.20	72.33	127.31	178.08	216.65	240.17	251.14	164.80	164.66	162.61	154.71	178.08	127.31	72.33	24.20	0.00	0.00	0.00	0.00
243	14.96	8.83	0.00	0.00	0.00	0.00	0.00	21.51	71.84	133.83	193.91	241.39	271.47	286.10	165.53	165.38	163.28	155.18	193.91	133.83	71.84	21.51	0.00	0.00	0.00	0.00
244	14.82	6.29	0.00	0.00	0.00	0.00	0.00	16.06	56.82	97.54	131.56	154.94	167.56	172.54	142.77	142.64	140.78	133.65	131.56	97.54	56.82	16.06	0.00	0.00	0.00	0.00
245	14.68	9.85	0.00	0.00	0.00	0.00	0.00	14.65	66.55	144.24	227.90	299.12	347.19	372.07	155.26	155.11	153.06	145.12	227.90	144.24	66.55	14.65	0.00	0.00	0.00	0.00
246	14.53	3.57	0.00	0.00	0.00	0.00	0.00	6.70	32.19	55.43	73.21	84.19	89.22	90.65	88.56	88.47	87.27	82.64	73.21	55.43	32.19	6.70	0.00	0.00	0.00	0.00
247	14.39	3.66	0.00	0.00	0.00	0.00	0.00	5.16	32.01	56.55	75.37	86.98	92.31	93.83	91.64	91.55	90.28	85.38	75.37	56.55	32.01	5.16	0.00	0.00	0.00	0.00

248	14.25	4.26	0.00	0.00	0.00	0.00	0.00	3.85	35.62	65.16	88.18	102.67	109.52	111.61	106.27	106.16	104.66	98.84	88.18	65.16	35.62	3.85	0.00	0.00	0.00	0.00
249	14.10	2.67	0.00	0.00	0.00	0.00	0.00	1.06	21.84	40.72	55.03	63.70	67.55	68.55	68.62	68.55	67.55	63.70	55.03	40.72	21.84	1.06	0.00	0.00	0.00	0.00
250	13.96	2.66	0.00	0.00	0.00	0.00	0.00	0.00	20.87	40.27	55.00	63.94	67.91	68.93	69.01	68.93	67.91	63.94	55.00	40.27	20.87	0.00	0.00	0.00	0.00	0.00
251	13.82	4.90	0.00	0.00	0.00	0.00	0.00	0.00	34.96	72.61	103.54	124.14	134.69	138.46	121.10	120.97	119.13	111.99	103.54	72.61	34.96	0.00	0.00	0.00	0.00	0.00
252	13.68	6.79	0.00	0.00	0.00	0.00	0.00	0.00	40.66	97.20	151.66	193.78	219.42	231.18	145.81	145.65	143.37	134.55	151.66	97.20	40.66	0.00	0.00	0.00	0.00	0.00
253	13.54	8.35	0.00	0.00	0.00	0.00	0.00	0.00	38.29	113.67	200.01	275.27	326.11	352.06	139.98	139.82	137.57	128.88	200.01	113.67	38.29	0.00	0.00	0.00	0.00	0.00
254	13.40	8.15	0.00	0.00	0.00	0.00	0.00	0.00	34.79	109.61	195.96	271.43	322.38	348.31	138.44	138.28	135.99	127.17	195.96	109.61	34.79	0.00	0.00	0.00	0.00	0.00
255	13.25	5.18	0.00	0.00	0.00	0.00	0.00	0.00	27.36	72.56	112.30	140.43	155.87	162.01	127.02	126.87	124.72	116.39	112.29	72.56	27.36	0.00	0.00	0.00	0.00	0.00
256	13.11	12.92	0.00	0.00	0.00	0.00	0.00	0.00	13.78	148.83	375.54	609.69	785.96	883.91	33.66	33.62	33.03	30.76	375.54	148.83	13.78	0.00	0.00	0.00	0.00	0.00
257	12.97	10.08	0.00	0.00	0.00	0.00	0.00	0.00	17.69	119.47	275.65	431.36	545.71	607.86	82.69	82.58	81.10	75.37	275.65	119.47	17.69	0.00	0.00	0.00	0.00	0.00
258	12.83	10.36	0.00	0.00	0.00	0.00	0.00	0.00	13.39	118.62	290.03	464.43	593.71	664.31	69.58	69.49	68.21	63.24	290.03	118.62	13.39	0.00	0.00	0.00	0.00	0.00
259	12.69	10.11	0.00	0.00	0.00	0.00	0.00	0.00	10.60	112.91	284.86	461.36	592.46	663.95	66.84	66.75	65.48	60.57	284.86	112.91	10.60	0.00	0.00	0.00	0.00	0.00
260	12.55	3.15	0.00	0.00	0.00	0.00	0.00	0.00	9.05	40.70	66.22	82.47	90.11	92.37	87.95	87.83	86.11	79.44	66.22	40.70	9.05	0.00	0.00	0.00	0.00	0.00
261	12.41	8.04	0.00	0.00	0.00	0.00	0.00	0.00	8.57	89.59	211.10	330.03	415.19	460.01	103.55	103.41	101.32	93.22	211.10	89.59	8.57	0.00	0.00	0.00	0.00	0.00
262	12.27	11.85	0.00	0.00	0.00	0.00	0.00	0.00	1.64	115.79	357.82	622.46	824.07	935.10	20.92	20.89	20.45	18.77	357.82	115.79	1.64	0.00	0.00	0.00	0.00	0.00
263	12.13	8.29	0.00	0.00	0.00	0.00	0.00	0.00	2.21	84.19	227.48	375.20	483.63	541.46	82.87	82.75	80.97	74.06	227.48	84.19	2.21	0.00	0.00	0.00	0.00	0.00
264	11.99	7.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	75.13	199.85	325.74	416.64	464.30	95.50	95.35	93.23	85.00	199.85	75.13	0.00	0.00	0.00	0.00	0.00	0.00
265	11.85	10.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	93.03	326.20	589.40	790.92	901.12	21.55	21.51	21.02	19.10	326.20	93.03	0.00	0.00	0.00	0.00	0.00	0.00
266	11.71	10.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	86.69	320.95	588.92	794.62	906.85	20.26	20.23	19.74	17.88	320.95	86.69	0.00	0.00	0.00	0.00	0.00	0.00
267	11.57	5.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	53.13	143.85	229.87	288.79	317.96	110.59	110.40	107.67	97.11	143.85	53.13	0.00	0.00	0.00	0.00	0.00	0.00
268	11.43	3.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.17	86.23	124.77	146.92	155.94	107.38	107.19	104.45	93.82	86.23	36.17	0.00	0.00	0.00	0.00	0.00	0.00
269	11.29	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.21	14.27	19.36	21.65	22.24	22.28	22.24	21.65	19.36	14.27	6.21	0.00	0.00	0.00	0.00	0.00	0.00
270	11.15	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.30	107.05	171.06	212.46	231.61	109.51	109.30	106.29	94.61	107.05	35.30	0.00	0.00	0.00	0.00	0.00	0.00
271	11.01	4.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	29.51	94.78	151.37	186.98	202.92	106.65	106.44	103.38	91.57	94.78	29.51	0.00	0.00	0.00	0.00	0.00	0.00
272	10.87	3.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.97	68.28	104.47	124.72	132.54	96.05	95.85	92.99	81.93	68.28	20.97	0.00	0.00	0.00	0.00	0.00	0.00
273	10.73	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.79	36.87	54.04	62.03	64.25	62.32	62.18	60.25	52.78	36.87	10.79	0.00	0.00	0.00	0.00	0.00	0.00
274	10.59	3.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.84	60.09	95.58	115.28	122.71	90.41	90.21	87.28	76.00	60.09	13.84	0.00	0.00	0.00	0.00	0.00	0.00
275	10.45	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.28	31.53	48.37	56.25	58.43	56.63	56.49	54.59	47.21	31.53	6.28	0.00	0.00	0.00	0.00	0.00	0.00
276	10.30	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.55	17.52	27.38	31.88	33.05	33.13	33.05	31.88	27.38	17.52	2.55	0.00	0.00	0.00	0.00	0.00	0.00
277	10.16	2.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.95	52.68	91.59	113.62	121.99	86.34	86.11	82.94	70.69	52.68	3.95	0.00	0.00	0.00	0.00	0.00	0.00
278	10.02	3.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66	74.53	148.56	198.16	220.78	90.96	90.72	87.22	73.73	74.53	0.66	0.00	0.00	0.00	0.00	0.00	0.00
279	9.88	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	62.30	125.21	165.79	183.49	89.34	89.09	85.49	71.62	62.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
280	9.74	4.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	107.93	267.54	390.64	452.72	60.63	60.45	57.89	48.03	107.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00
281	9.59	4.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	88.07	223.27	325.77	376.37	68.23	68.02	64.99	53.36	88.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
282	9.45	4.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.00	315.49	480.56	564.77	40.68	40.54	38.64	31.37	110.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
283	9.31	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	76.04	219.94	331.24	386.02	63.02	62.80	59.70	47.86	76.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
284	9.16	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.60	28.61	36.19	38.17	38.31	38.17	36.19	28.61	12.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
285	9.02	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.00	19.80	25.42	26.89	26.99	26.89	25.42	19.80	8.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
286	8.87	5.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	94.74	399.12	659.71	792.85	12.36	12.31	11.60	8.89	94.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00
287	8.73	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.24	392.84	662.94	800.45	11.27	11.22	10.53	7.92	81.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00
288	8.58	4.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	69.75	403.43	697.15	846.30	8.15	8.12	7.59	5.59	69.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
289	8.44	3.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	34.68	243.24	423.02	512.04	35.19	35.02	32.60	23.49	34.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290	8.29	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	20.70	29.47	31.81	31.97	31.81	29.47	20.70	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
291	8.14	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	8.20	12.01	13.03	13.10	13.03	12.01	8.20	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
292	7.99	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	127.33	233.84	283.35	54.53	54.21	49.69	32.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
293	7.84	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.99	78.73	90.94	54.96	54.62	49.75	31.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
294	7.69	2.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	225.66	472.83	594.44	20.02	19.89	17.99	10.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
295	7.54	1.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.59	96.28	114.95	54.16	53.77	48.27	28.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
296	7.39	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.77	43.15	49.67	40.64	40.33	35.89	19.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
297	7.24	2.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	195.03	491.62	637.11	14.01	13.90	12.25	6.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
298	7.09	3.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	230.36	634.97	834.42	5.96	5.91	5.15	2.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
299	6.93	2.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	196.00	599.04	797.67	5.51	5.46	4.70	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300	6.78	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.39	125.79	163.61	44.45	43.98	37.36	14.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
301	6.62	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.69	11.59	13.87	14.03	13.87	11.59	3.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
302	6.46	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.61	213.89	294.96	33.25	32.83	26.96	6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
303	6.31	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.93	49.96	66.16	36.20	35.69	28.70	5.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
304	6.15	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.11	139.10	199.12	35.38	34.84	27.34	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
305	5.99	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	105.07	153.71	35.18	34.58	26.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
306	5.82	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	126.77	193.80	31.90	31.30	23.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
307	5.66	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	282.16	458.47	15.14	14.82	10.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
308	5.49	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	243.31	415.04	16.42	16.03	10.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
309	5.32	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	420.36	766.12	3.49	3.40	2.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
310	5.15	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	272.90	535.67	8.38	8.13	4.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
311	4.98	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	5.15	5.33	5.15	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
312	4.80	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	224.74	553.12	6.16	5.92	2.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
313	4.63	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	221.97	653.38	2.85	2.72	1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
314	4.44	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.96	208.49	17.35	16.44	4.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
315	4.26	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.53	250.09	14.29	13.40	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
316	4.07	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	1.26	1.36	1.26	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
317	3.88	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.81	13.11	11.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
318	3.68	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.70	10.28	9.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
319	3.47	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.80	11.59	10.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320	3.26	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	529.35	1.49	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
321	3.04	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	542.73	1.12	0.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
322	2.81	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	106.96	7.68	5.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
323	2.56	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	156.43	5.04	2.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
324	2.30	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	3.32	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
325	2.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	3.48	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
326	1.68	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
327	1.29	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
328	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

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