Documentation for the **RoomAccum** Program

Keith W. Kintigh

2020-03-18

The program RoomAccum is a Windows program written in Delphi, and extension of Pascal as implemented in the Embarcadero RAD Studio XE. The program logic can be seen in the program source file roomaccum12.dpr. Supporting procedures not essential to the program logic are in KWKSTD.PAS and are compiled in KWKSTE.DCU.

**Running the program**

Download the RoomAccumXX.exe file from Github to a directory on your computer. To run the program, navigate using the Windows File Explorer, to that directory and double-click on roomaccum12.exe. In a Windows “Run” window, You will see the program banner reproduced below. After that, the program will prompt you for information that it needs to run. Default answers are provided in {curly braces} and can be obtained by just pressing Enter. Reply Y or N to yes or no questions. For more information on running my programs may be found at <http://tfqa.com>. See especially <http://tfqa.com/windos.htm> and <http://tfqa.com/conventions.htm>.

**Sample Input file**

The program looks for input from a .txt file that must be saved in the same directory on your computer as the .exe file. The .txt files contains the dates and room counts and can be created using an editor such as NotePad that creates simple .txt files (or saving a Word document as plain text). That file needs to consist of the number of periods to be considered, the starting date for the sequence followed by, for each period, the end date of the period, and the number of rooms dated to that period. All values must be integers and must be separated by at least one space or newline.

3

200 550 646

1000 1215

1150 4848

**Sequence of Program Prompts**

┌────────────────────────────────────────────────┐

│ RoomAccum V12.0 │

│ Population Growth/Room Accumulation Simulation │

│ │

│ (C) 2004-2020 Keith W. Kintigh │

│ All Rights Reserved │

│ │

│ 2014 East Alameda Drive │

│ Tempe, Arizona 85282 │

└────────────────────────────────────────────────┘

File with Period Data (Reply CON for Keyboard Entry) {.TXT} ? mimbresp3

File Must Have: nPeriod, Start[1], End[1], Rooms[1], End[2] Rooms[2]...

Provide the name of the file you wish to run. You need not enter the extension if it is the same as the default provided within the curly braces. If the program says it can’t find the file you mistyped the name or it is in a different directory.

Display Annual Room Count on Screen {N} ?

Answering Y for yes to this question provides a very verbose output of the program progress.

Write Output Data to TXT File {N} ? Y

Answering Y to this prompt says you want, in addition to the output on the screen, a file with the results. If you answer Y it will ask you for the file name.

TXT Output File {MIMBRESP3\_T.txt} ?

If you answered Y to the previous prompt Enter the file name, or if the offered default name is OK, just press Enter.

Write Period by Period Output Data to CSV File {N} ?

Write Annual Output Data to CSV File {N} ?

Similarly, the program asks whether you want other sorts of program output saved to a .csv file by the program. This is useful if you want to plot the results, for example in R.

Random Generator Seed (0 to set from clock) {0} ?

Random Seed: -581923690

You can set a random number generator seed if you wish to be able to reproduce a run exactly (rare). Setting from the clock is what you will almost always want to do.

Compound Interest Formula Implied Growth Calculation

Period Start End Implied Growth

1 - 2 375 775 0.095

2 - 3 775 1075 0.831

The program reports the then it reports the formula-derived, between period growth rates, the first of which which may be useful in selecting the number of initial rooms.

[I]terate Growth Rate or [U]ser Control {I} ?

Normally you would iterate the growth date, which means the program will iterate through possible rates for each until it finds the rate the produces the observed number of dated rooms. If you say N it will simply run the program for your supplied rate and tell you the results. Reply Enter or I unless you have a specific reason not to.

Structure Use Life {25} ?

S.D of Structure Use Life (reply 0 for Not Randomized) {0.0} ? 5

Use Lives are Normally Distributed Around 25 with S.D. of 5.0

Use Life Distribution Truncated to: Min=1; Max=2\*Structure Life

You first enter the nominal structure use-life. You then have the option to answer 0 (the default) to the next question to use that fixed use-life or to have normally distributed use-lives around your number with a standard deviation that you provide.

Randomly Age Period 1 Structures (Rec. Unless Uselife<<Period 1 Length) {Y} ?

Ordinarily you would want to randomly age the structures in the initial period unless you believe that there was no previous occupation.

Scale Factor to Improve Estimates {100} ?

In order to make the computations more accurate, the program will scale up all of the room numbers by a factor for its internal computations. This scaling is removed in the results. This basically reduces the sampling error due to ransom processes in the analyses.

Initial Number of Period 1 Rooms {0} ? 30

Here you supply the initial number of period 1 rooms. You will want to try different values in successive runs of the program. The article recommends running the program to find the number of initial rooms that make the smallest difference between the simulated growth rate of the first two periods with the formula’s growth rate between the first two periods. This will usually (or perhaps always be the number of rooms for which the modeled growth rates for the first two periods are closest together.

1-34

2-25

3-23

The program shows you the number of iterations for each period’s calculations (which do not matter) and then shows the program results, below.

Structure Life: 15 Initial Period 1 Ages Randomized (Uniformly Distributed)

Start End Start Initial MidPt Ending Dated Target Growth

Period Date Date Rooms Dated Rooms Rooms Rooms Rooms Rate %

1 200 550 23 23 27 32 646 646 0.092

2 550 1000 32 15 40 51 1215 1215 0.104

3 1000 1150 51 24 268 1418 4848 4848 2.246

Run Again {Y} ?

Replying yes allows you to run the program again, starting from the structure use-life prompt. If you reply no, the program ends.

Program End

OK to Close Program Window {Y} ?

It provides this prompt to allow you to examine the on-screen results. One you reply with Y or Enter it will close that window and you won’t be able to recover it.

**Sample Output Text File**

Random Seed: -618053446

Compound Interest Formula Implied Growth Calculation

Period Start End Implied Growth

1 - 2 375 775 0.095

2 - 3 775 1075 0.831

Structure Life: 15 Initial Period 1 Ages Randomized (Uniformly Distributed)

Start End Start Midpt Ending Dated Target Growth

Period Date Date Rooms rooms Rooms Rooms Rooms Rate %

1 200 550 23 27 32 646 646 0.09

2 550 1000 32 40 51 1215 1215 0.10

3 1000 1150 51 268 1418 4848 4848 2.25

**Sample Period Output CSV File**

UseLife,UseSD,InitRm,Period,PerBeg,PerEnd,PerInitRm,PerMidRm,PerEndRm,PerDatedRm,TargRm,Rate

15, 0.0, 23,1, 200, 550, 23, 27, 32, 646, 646, 0.092

15, 0.0, 23,2, 550, 1000, 32, 40, 51, 1215, 1215, 0.104

15, 0.0, 23,3, 1000, 1150, 51, 268, 1418, 4848, 4848, 2.246

**Sample Yearly Output CSV File**

UseLife,UseSD,InitRm,Year,OccRm

15, 0.0, 23, 200,0

15, 0.0, 23, 201,23

15, 0.0, 23, 202,23

15, 0.0, 23, 203,23

15, 0.0, 23, 204,23

15, 0.0, 23, 205,23

15, 0.0, 23, 206,23

15, 0.0, 23, 207,23

15, 0.0, 23, 208,23

15, 0.0, 23, 209,23

15, 0.0, 23, 210,23

...

15, 0.0, 23, 1145,1269

15, 0.0, 23, 1146,1297

15, 0.0, 23, 1147,1326

15, 0.0, 23, 1148,1356

15, 0.0, 23, 1149,1387

15, 0.0, 23, 1150,1418