

CS 6752 Homework 1

Due: Tuesday, August 30 at 1:30 pm

Assignment 1: Family Simulation

In this HW, you will get practice writing a small Python program using the basics of the language: conditionals, iteration, I/O, functions, etc.

How many children must a couple have in order to make sure they have at least one boy and one girl? In this program, you will develop a simulation that will help you estimate the answer to that question. Your objective is to model a couple that continues to have children and only stops once they have at least one boy and one girl. Assume that for any particular childbirth, the chances of having a boy or a girl are even. Model this with a simple coin toss (i.e., use a random number generator).

More specifically, write a program that prompts the user for the number of couples in the simulation. The program then should simulate each couple's child birth pattern, printing out the order of boys and girls born. Once the requisite number of families has been simulated, print out both the average and maximum number of children necessary to achieve the problem constraints. Also print the total number of boys and girls born.

After that, prompt the user whether they want to run another simulation and continue in the same fashion until the user decides to quit.

A sample run might look like the following:

```
> python family.py
Ready to run a family simulation. Enter the number of families:
4
Simulating Families
1 - B B G
2 - G B
3 - G G G B
4 - B G
The average number of children was 2.75 and maximum was 4.
A total of 5 boys and 6 girls were born.
```

```
Would you like to run another simulation? (y/n)
y
Ready to run a family simulation. Enter the number of families:
25
1 - G G B
2 - B G
...
```

Notes & Hints:

- You can assume that the user will only enter an integer for the number of families.
- That said, the user may enter an unallowable integer, and may respond with an inappropriate character to the continue question. Your program should handle these situations well.
- Do NOT code this entire program in one big chunk. Modularize your code.
- Try a big number like 100 and see what your answers are.

Turn-in Procedures

After you have finished the above assignment, turn it in via T-Square. Please name your file: LastName_family.py.