DAT-119 – Python 1

**Homework 4**

As always, you need to write these programs *without searching online*. You can use the textbook, the Jupyter notebooks, conversations with your colleagues and me, and the approved resources; that’s all.

Also, as always, **be sure to follow the style guide**, including turning in a plan with your code. Seriously, **don’t forget to plan before you code!**

1. Please put together a program that takes in a year from the user and tells them how many days February had in that year. (History buffs: let’s assume we’ve been using the Gregorian calendar forever, OK?)

While this is *always* true for *every* assignment (unless I explicitly say otherwise), this is *especially* true for this program: *you may* ***not*** *use Google or any other search engine on any step of this program*.

* There are 28 days in February, unless it is a leap year.
* If it is a leap year, there are 29 days in February. Leap year criteria, from [TimeAndDate.com](https://www.timeanddate.com/date/leapyear.html):
  + The year can be evenly divided by 4;
  + If the year can be evenly divided by 100, it is NOT a leap year, **unless**;
  + The year is also evenly divisible by 400. Then it is a leap year.
* There was no year 0. If you want your program to accept years before 0, you can assume “-1” is “1 BCE” and “-20” is “20 BCE.” (Or you could just reject years less than 1, since it isn’t like we really had leap years Before Common Era anyway.)

(There’s some subtlety to the logic, here. Map it out for yourself before you try coding it. This is where your planning document is GOLDEN. Run the test cases below through your logic before you try to code anything. Trust me.)

**Test cases:** the years 2000 and 2400 have 29 days, while 1800, 1900, 2100, 2200, 2300 and 2500 have 28 days. 1924 had 29 days.

**Example output from three separate runs of the program:**

Welcome to the Leap Year Calculator! I will tell you how many days February had in any given year.

What year would you like me to check? 2000

The year 2000 was a leap year with 29 days in February.

Welcome to the Leap Year Calculator! I will tell you how many days February had in any given year.

What year would you like me to check? 0

There was no year 0.

Welcome to the Leap Year Calculator! I will tell you how many days February had in any given year.

What year would you like me to check? 1900

The year 1900 was not a leap year; it had 28 days in February.

1. Let’s say you have a friend who plans a lot of events, at a lot of different venues. Write a script that asks the user for the number of people attending an event, the number of seats available at each table in the venue (assume all tables are the same size), and the maximum number of tables available at the venue.

The program should output “This party won’t fit at this venue” or something similar if the available tables won’t fit the party size.

*If the party will fit*, the program should output the number of tables that will be required to seat the party. It should also output how many spaces the smallest table would have open, if all of the other tables were filled.

**Example program output (two separate runs):**

Hi, I'm here to help you plan events! Tell me how big your party is, how many tables the venue has, and how many chairs fit at each table, and I will help you determine how best to fit your party, if it's possible.

How many people do you expect? 80

How many tables does the venue have? 10

And how many chairs fit at each table? 15

You need 6 tables.

That will leave 10 seats open.

Hi, I'm here to help you plan events! Tell me how big your party is, how many tables the venue has, and how many chairs fit at each table, and I will help you determine how best to fit your party, if it's possible.

How many people do you expect? 80

How many tables does the venue have? 10

And how many chairs fit at each table? 7

I'm sorry, that party will not fit at that venue. Good luck!

1. Read sections 3.7-3.13 and 3.15 in the textbook. Bring questions to class.