Recitation 07
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Files & Exceptions

Exercise 1 - (Gaddis 6.1) File Display

Assume that a file containing a series of integers is named `numbers.txt` (or download one **here**) and exists on the computer's disk.
Write a program that displays all of the numbers in the file.

Exercise 2 - (Gaddis 6.3) Line Numbers

Write a program that asks the user for the name of a file. The program should display the contents of the file with each line preceded with a line number followed by a colon. The line numbering should start at 1.

Exercise 3 - (Gaddis 6.7) Random Number File Writer

Write a program that writes a series of random numbers to a file. Each random number should be in the range of 1 through 500. The application should let the user specify how many random numbers the file will hold.

Exercise 4 - Random Number File Reader

This exercise assumes you have completed Programming Exercise 3, Random Number File Writer.
Write another program that reads the random numbers from the file, display the numbers, and then display the following data:

- The number of random numbers read from the file
- The sum total of the numbers
- The average of the numbers

Your program must handle the following **exceptions**:

- any IOError exceptions that are raised when the file is opened and data is read from it,
- any ValueError exceptions that are raised when the items that are read from the file are converted to a number.

Exercise 5 - (Gaddis 7.5) Charge Account Validation

Start by **downloading** the data file `charge_accounts.txt` (**link**). This file has a list of a company's valid charge account numbers. Each account number is a seven-digit number, such as `5658845`.
Write a program that reads the contents of the file into a list. The program should then ask the user to enter a charge account number. The program should determine whether the number is valid by searching for it in the list. If the number is in the list, the program should display a message indicating the number is valid. If the number is not in the list, the program should display a message indicating the number is invalid.

Exercise 6 - (Gaddis 7.8) Name Search

Start by **downloading** the following data files:

- `GirlNames.txt` (**link**) - This file contains a list of the 200 most popular names given to girls born in the United States from the year 2000 through 2009.
- `BoyNames.txt` (**link**) - This file contains a list of the 200 most popular names given to boys born in the United States from the year 2000 through 2009.

Write a program that reads the contents of the two files into two separate lists. The user should be able to enter a boy's name, a girl's name, or both, and the application will display messages indicating whether the names were among the most popular.

Exercise 7 - (Gaddis 7.9) Population Data

Start by **downloading** the data file `USPopulation.txt` (**link**). The file contains the midyear population of the United States, in thousands, during the years 1950 through 1990. The first line in the file contains the population for 1950, the second line contains the population for 1951, and so forth.
Write a program that reads the file's contents into a list. The program should display the following data:

- The average annual change in population during the time period
- The year with the greatest increase in population during the time period
- The year with the smallest increase in population during the time period