CSI31
Introduction to Computer Programming I

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Topics

- Indefinite loops or while loops

- Sentinel loops

- Nested loops

Loops

- Definite Loop:
  - A loop that iterates a fixed number of times, where the number is know when the loop starts
  - for loop
- Indefinite loop:
  - A loop that will iterate as long as some condition is true and stop when the condition is false.
  - while loop

Average problem

- Problem: Compute the average of a list of numbers where the number of numbers is known ahead of time.

- Design: First ask for how many numbers.

- Then use a for loop with that number to get each number as input.

- Create the sum of all the numbers.

- Divide the sum by the number of numbers.

- See average1.py

Average problem

- Problem: Compute the average of a list of positive numbers where the number of numbers is <u>not known</u> ahead of time.

- Note: You need to keep a running total of the numbers and count the number of numbers at the same time.

- An interactive loop asks you whether you wish to continue for each number.

- See average2.py

Sentinel Loop solution

- A sentinel loop uses a certain input as the signal to quit.

- average3.py uses a negative number as the signal to quit.

- This solves the problem as long as there are no negative number in the list of numbers to average.

A better sentinel loop solution

- Use an empty string as the sentinel.
- average4.py

Average the numbers stored in a file

- The numbers are stored in a file, one number per line.

- Use a file loop - average5.py

Another version with the numbers stored in a file.

- Suppose the numbers to be averaged are stored in a file. There might be more that one number per line. Multiple numbers on a line are separated by commas.

- This solution uses nested loops

- The outer loop reads lines from the file.

- The inner loop processes the numbers from the line.

- average7.py