COMP 141

Input Validation Loops

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Announcements

- Program 5 has been assigned
  - Due Thursday, October 19th by 11:55pm on Moodle

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Sentinels

- **Sentinel: special value that marks the end of a sequence of items**
  - When program reaches a sentinel, it knows that the end of the sequence of items was reached, and the loop terminates
  - Must be distinctive enough so as not to be mistaken for a regular value in the sequence
  - Example: when reading an input file, empty line can be used as a sentinel

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Using a Sentinel

For the following input, what is the value of temp?

4 7 5 9 1 -1

```
def main():
    input1 = int(input("Please enter an integer: "))
    temp = 0
    while(input1 > 0):
        temp += input1
        input1 = int(input("Please enter another integer: "))
    print("Temp: ", temp)

main()
```

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Input Validation Loops

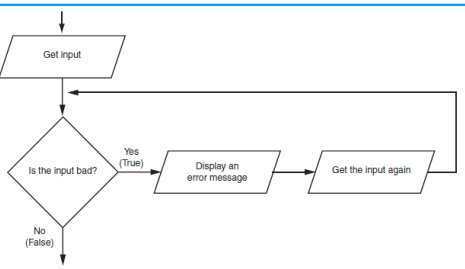
- Computer cannot tell the difference between good data and bad data
  - If user provides bad input, program will produce bad output
  - GIGO: garbage in, garbage out
  - It is important to design your program such that bad input is never accepted

Input Validation Loops

- **Input validation: inspecting input before it is processed by the program**
  - If input is invalid, prompt user to enter correct data
  - Commonly accomplished using a `while` loop which repeats as long as the input is bad
    - If input is bad, display error message and receive another set of data
    - If input is good, continue to process the input

Input Validation Loops (cont'd.)

Figure 5-8 Logic containing an input validation loop



The following code will ask for a test score and check to see if it's a valid score. If not, it will re-prompt the user to enter the score.

```
score = int(input("What is your score? "))
while score < 0 or score > 100:
    print("Not a valid score!")
    score = int(input("What is your score? "))
```

You can also do this with string inputs. (We will learn more useful ways to compare strings (lowercase to lowercase) later this semester.)

```
shape = input("What is your shape? circle or square?")
while shape != "circle" and shape != "square":
    print("Please enter a valid shape.")
    shape = input("What is your shape? circle or square?")

print("We have a valid shape: ", shape)
```

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Running Total with Input Validation

- Write a loop that adds up the user inputted numbers. Assume the user will enter a 0 to signal they are done entering numbers.
- Calculate the average of the numbers.
- Add input validation so that user can only enter numbers between 0 and 100.

Practice (x2)

1. Write a program that prompts the user to enter a number between 50 and 100. If they don't follow instructions and enter a number outside that range, re-prompt them. Continue to re-prompt them to enter a number until the number they enter is between 50 and 100. Print out their legal input.

Note: Test your code by inputting values outside the range (at least 2) to make sure it's working properly.

2. Write a program that starts off asking the user how much money they have in their bank account. Next, add a menu to let the user add money, subtract money, or quit the ATM program. Let the user keep using the ATM as long as they want (until they choose to quit). Prevent the user from withdrawing more money than they have in their account. Use input validation to prevent the user from typing in a negative amount of money.

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