Intro to Programming (No Prior Experience)

Class 06 – Module 4 Review

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T/R 4:55PM–6:10PM

Agenda

- Poll Everywhere Review
- Continue practicing While Loops

Review:
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Do we need a while loop to solve this problem?

- Write a program that asks the user for two numbers
- If the first number is greater than the second number, add the numbers and display the total
- If the second number is greater than the first number, multiply the numbers and display the product

```
Enter 1st number: 5

Enter 2nd number: 10

Product: 50
```

Do we need a while loop to solve this problem?

- Write a program that asks the user for two numbers. Only accept positive values
- If the first number is greater than the second number, add the numbers and display the total
- If the second number is greater than the first number, multiply the numbers and display the product

```
Enter 1st number: 5

Enter 2nd number: -10
Sorry, try again
Enter 2nd number: 10

Product:  50
```

Do we need a while loop to solve this problem?

- Ask the user to enter in 5 price values
- Add these values to a total variable
- Print out the total at the end of the program plus 7% sales tax

```
Enter price: 1.00
Enter price: 2.00
Enter price: 3.00
Enter price: 3.00
Enter price: 1.00

Your total:  10.00
Tax:  0.70
Grand total:  10.07
```

Do we need a while loop to solve this problem?

- Ask the user to enter in a potentially ***unlimited*** number of price values
- Add these values to a total variable
- Print out the total at the end of the program plus 7% sales tax

```
Enter price, 0 to end: 1.00
Enter price, 0 to end: 2.00
Enter price, 0 to end: 3.00
Enter price, 0 to end: 3.00
Enter price, 0 to end: 1.00
Enter price, 0 to end: 0

Your total:  10.00
Tax:  0.70
Grand total:  10.07
```

Two ways to set up your while loops

while condition == True:

Keeps looping until the condition is no longer true (either arithmetic happens so that it is no longer true, or we set the condition to false)

while True:

Immediately enters and continues to loop indefinitely until the program encounters a break

```
a = 0
b = 4

while a < b:
    a += 1  # Enters the loop: a = 0,
            # Run 1: a -> 1,
            # Run 2: a -> 2,
            # Run 3: a -> 3,
            # Run 4: a -> 4,
            # -> will not enter loop a 5th time
```

```
# set up control variable
keepAsking = True

if keepAsking == True: # enters the loop

    # will keep asking user to give them an integer
    num = int(input("Give me an integer: "))

    # until the condition is no longer true
    if num > 0:
        print("Thank you for inputting a valid integer")
        keepAsking = False
    else:
        print("Keep trying")
        # go back to the top of the loop and ask for input again
        # because keepAsking is still true
```

```
while True: # enter loop immediately

    # will keep asking user to give them an integer
    num = int(input("Give me an integer: "))

    # until the program reaches a BREAK
    if num > 0:
        print("Thank you for inputting a valid integer")
        break
    else:
        print("Keep trying")
        # go back to the top of the loop and ask for input again
```

Programming Challenge: Marbles

- Assume you have a jar that contains 5 marbles. The jar can hold 10 marbles total.
- Continually ask the user if they want to add or remove a marble
- If they add a marble you should increase the total # of marbles in the jar. If the jar is full tell the user and end the program.
- If they remove a marble you should decrease the # of marbles in the jar. If the jar is empty you should tell the user and end the program.

```
marbles = 5

while True:
    response = input("Would you like to add or remove a marble?: ")

    if response == "add":
        marbles +=1
    elif response == "remove":
        marbles -=1

    if marbles == 10:
        print("The jar is full.")
        break
    if marbles == 0:
        print("The jar is empty.")
        break
```

Programming Challenge: Grocery Shopping

Write a program that asks the user for an item's name and then its price

When the user enters the word "end" you should stop asking the user for item names and prices and display the following:

- The list of items they purchased
- Their total bill
- The highest priced item
- The lowest priced item

```python
# accumulator variables
total_cost = 0
minimum = 0.00
maximum = 0.00
number_of_items = 0
all_items = ""

# create a loop that keeps going until a sentinel is typed
while True:
    item_name = input("Enter an item's name (or type 'end'): ") # ask for item name
    if item_name == "end": # set sentinel aka when do I stop?
        break
    item_price = float(input("Enter an item's price: ")) # ask for price
    if number_of_items == 0: # set first item equal to both min and max
        maximum = item_price
        minimum = item_price
    if item_price > maximum: # check and update max
        maximum = item_price
    if item_price < minimum: # check and update min
        minimum = item_price

    # update accumulator variables
    total_cost += item_price
    all_items += item_name + " "
    number_of_items += 1

print("You purchased:", all_items, sep=",")
print("Total price:", total_cost)
print("Most expensive price:", maximum)
print("Lease expensive price:", minimum)
```

Programming Challenge: Star Drawer

Step 1: Write a program that prompts the user for two numbers. Ensure that both integers are positive, and that the second integer is larger than the first.

Step 2: Generate first half of pattern

Step 3: Generate second half of patter

```
while True:
    # keep asking for num1 input
    num1 = int(input("Number 1: "))
    if num1 <= 0:
        print("Invalid, try again") # ask again
    else: # num1 input is valid
        while True: # start another loop for num2 input
            # keep asking for num2
            num2 = int(input("Number 2: "))
            # num2 needs to be positive and greater than num1
            if num2 <= 0 or num2 < num1:
                print("Invalid, try again")
            else:
                break #num2 is good, get out of the loop
        break #num1 is good, get out of the loop

# set counter equal to first number
counter = num1

# print first part of triangle
while counter <= num2:
    print(counter, "*" * counter)
    counter += 1
# counter is going to be 1 more than num2
# we don't want to print another row of num2, so subtract 2

counter -= 2

# print second part of triangle
while counter >= num1:
    print(counter, "*" * counter)
    counter -= 1
```

Programming Challenge: Prime Number Checker

- Write a program that asks the user for an integer
- Test to see if the number is prime. A prime number is any number that is only divisible by 1 and itself.

Homework

- Assignment #4 (due Tues)
- Self-Paced Learning Module #5 (due Tues)
- Quiz #5 (due Tues)