

Program Assignments – While Loops. Develop an IPO for each of the problems below. Place the IPO into your repository. Then write code for each problem and place those files (py) into your repository. Paste the link to your repository into the Assignment Completion Link on Blackboard.

1. Develop flowgorithm and code this this problem. Display the odd numbers starting at 1 and ending with 25. Use a while loop structure for this problem.

Set counter to 1	If != 25: - Print - Counter = counter + 2	
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#before
counter = 1

#during
while counter != 27:
 print(counter)
 counter = counter + 2

2. Allow the user to enter a start value, stop value and increment value from the keyboard. Display all the numbers from the start value to stop value using the increment value as you proceed. Use a while loop structure for this problem.

- Input start value - End value - Increment value	- While number <= end - Print (number) - Number = number + increment	
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#input phase
number = float(input("Enter Start value:"))
end = float(input("Enter end value:"))
increment = float(input("Enter increment:"))

#process phase
while number <= end:
 print(number)
 number = number + increment

3. Prompt the user on whether they want to do this program (**just before the while loop**). “Yes” entry means they want to continue. Any other response indicates they will stop the program. This response is the loop control variable. If the user answers “Yes” then go into the while loop.

Once in the while loop. You are to prompt the user for their last name and two exam scores. Compute the average exam score. Display last name and average. After the loop, display a count of the number of students who entered data.

Finally, the **last statements within the while loop** will ask the user if they want to do this loop again. In other words the user needs to be prompted again. The reason is that the end of the loop takes execution to the while condition to be evaluated again. It can not take us to the first few lines of code that prompt the user for the first time. That code is out of the loop. Therefore, we need a second prompt at the bottom, inside the loop.

- Enter loop? YES	- While response == yes - Input last name - Two exam scores - Average score = score 1 + score 2	- Display count of students
- Student count = 0	- Print last name - Average score	

#input phase

```
response = input("Would you like to continue? (y/n)")
students = 0
```

#process phase

```
while response == "y":
    name = input("Enter last name: ")
    one = float(input("Exam score one: "))
    two = float(input("Exam score two: "))
    average = (one + two) / 2
    print(name, "has an average score of: ", average)
    students = students + 1
```

```
response = input("Would you like to continue?")
```

#output phase

```
print("Count of students", students)
```

4. Prompt the user on whether they want to do this program (**just before the while loop**). Yes means they want to continue. Any other response indicates they will stop the program. This response is the loop control variable. If the user answers Yes then go into the while loop.

Once in the while loop. You are to prompt the user for employee last name, hours worked and rate of pay. Compute gross pay. Give the employee time and a half for hours worked over 40. Sum the gross pay and count the number of employees.

For each employee display their last name and gross pay.

After the loop (all data entered) display the sum of all the gross pays, and count of the number of employees. Compute and display the average pay.

Finally, the **last statements within the while loop** will ask the user if they want to do this loop again. In other words the user needs to be prompted again. The reason is that the end of the loop takes execution to the while condition to be evaluated again. It can not take us to the first few lines of code that prompt the user for the first time. That code is out of the loop. Therefore, we need a second prompt at the bottom, inside the loop.

Input would you like to continue?	Number of employees = 0 Sum of gross pays = 0	Print sum gross Number of employees average
	While response == y: Input last name Hours woked Rate If hours > 40:	

#before

```
response = input("Would you like to continue? Y or N:")  
employee = 0  
sum_gross = 0
```

#during

```
while response == "Y":  
    name = input("Enter last name:")  
    hours = float(input("Enter hours worked:"))  
    rate = float(input("Enter rate of pay:"))  
    if hours > 40:  
        overtime = (hours - 40) * (rate * 1.5)  
        gross = 40 * rate  
        gross = gross + overtime  
    else:  
        gross = hours * rate  
    print(name,"gross pay is:", gross)  
    employee = employee + 1  
    sum_gross = sum_gross + gross  
    response = input("Would you like to continue? Y or N:")
```

#after

```
print("Sum of all gross pay", sum_gross)  
print("Number of employees", employee)  
average = sum_gross / employee  
print("Average gross pay:", average)
```

5. Prompt the user on whether they want to do this program (**just before the while loop**). Yes means they want to continue. Any other response indicates they will stop the program. This response is the loop control variable. If the user answers Yes then go into the while loop.

Once in the while loop. You are to prompt the user for quantity and price of an item. Compute extended price (quantity times price of an item. If the extended price is greater than 10000.00 compute a discount of 25%. All other orders get a 10% discount. For each order display extended price, discount amount (extended price x discount percent), total (extended price – discount amount).

For each order sum the discount amount.

After the loop (all data entered) display the sum of all the discounts.

Finally, the **last statements within the while loop** will ask the user if they want to do this loop again. In other words the user needs to be prompted again. The reason is that the end of the loop takes execution to the while condition to be evaluated again. It can not take us to the first few lines of code that prompt the user for the first time. That code is out of the loop. Therefore, we need a second prompt at the bottom, inside the loop.

Input Y or N Discount = 0	While Y: <ul style="list-style-type: none">- Quantity- Price- Extended price- If extended > 10,000:<ul style="list-style-type: none">o Discount = extended x 25%- Else:<ul style="list-style-type: none">o Discount = extended x 10%- Print extended, discount, and total- Discount = discount + discount- Input Y or N	Print sum of all discounts
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```
#before
response = input("Would you like to continue? Y or N:")
sum_discount = 0
```

```
#during
while response == "Y":
```

```
quantity = float(input("Enter quantity:"))
price = float(input("enter price:"))
extended = quantity * price
if extended > 10000:
    discount = extended * .25
else:
    discount = extended * .10
print("extended price:", extended)
print("discount:", discount)
total = extended - discount
print("total", total)
sum_discount = sum_discount + discount
response = input("would you like to continue? Y or N:")
```

```
#after
print("sum of discounts:", sum_discount)
```