Session 6 Assignment Problems – Loop Logic 1

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

Flowgorithm:

```
Start
Declare oddValue as Integer
Set oddValue = 1
While oddValue <= 25
   Output oddValue
   oddValue = oddValue + 2
End While
End
```

Input	Process	Output
None (starting value and ending value are predefined)	Initialize a counter variable to 1	Display all odd numbers starting at 1 and ending at 25
	While the counter is less than or equal to 25: ● Display the counter value ● Add 2 to the counter to move to the next odd number	

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	Process	Output

Start value	Read the start value, stop value, and increment value from the user	• Display all numbers from the start value to the stop value using the specified increment value
Stop value	Assign the start value to a current value variable	
Increment value	While the current value is less than or equal to the stop value: • Display the current value • Add the increment value to the current value	

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.

Input	Process	Output

User response (Yes or No)	Prompt the user to determine if they want to run the program	Display each student's last name and average exam score
Student last name	Initialize a student counter to 0	Display the total number of students entered (after the loop ends)
Exam score 1	While the user response is "Yes": ● Prompt the user for student last name ● Prompt the user for two exam scores ● Compute the average exam score ● Average = (Exam score 1 + Exam score 2) ÷ 2 ● Display the student's last name and average exam score ● Increment the student counter by 1 ● Prompt the user again to determine if they want to repeat the loop	
Exam score 2	End while loop	

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	Process	Output
User response (Yes or No)	Prompt the user to determine if they want to run the program	Display each employee's last name and gross pay
Employee last name	Initialize: ● Total gross pay to 0 ● Employee counter to 0	Display total gross pay for all employees
Hours worked	While the user response is "Yes": ● Prompt for employee last name ● Prompt for hours worked ● Prompt for rate of pay ● If hours worked is greater than 40: -Compute regular pay for 40 hours	Display number of employees entered

	-Compute overtime pay at time-and-a-half for hours over 40 -Compute gross pay	
Rate of pay	Else: ● Compute gross pay as hours worked multiplied by rate of pay ● Display employee last name and gross pay ● Add gross pay to total gross pay ● Increment employee counter by 1 ● Prompt the user again to determine if they want to repeat the loop	Display average employee pay
	End while loop	
	Compute average pay as total gross pay divided by employee count	

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 the 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	Process	Output
User response (Yes or No)	Prompt the user to determine if they want to run the program	Display extended price, discount amount, and total price for each order
Quantity of item	Initialize total discount amount to 0	Display the sum of all discount amounts after all data has been entered
Price per item	While the user response is “Yes”: ● Prompt the user for quantity of the item ● Prompt the user for price of the item ● Compute extended price - Extended price = quantity × price - If extended price is greater than 10,000.00: - Set discount rate to 25%	

	Else: ● Set discount rate to 10% Compute discount amount ● Discount amount = extended price × discount rate Compute total price ● Total price = extended price − discount amount ● Display extended price, discount amount, and total price ● Add discount amount to total discount ● Prompt the user again to determine if they want to repeat the loop	
	End while loop	