CL-1002 Programming Fundamentals

LAB - 02

Problem solving with Decision and iterative structure using Scratch

NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES
Fall 2022

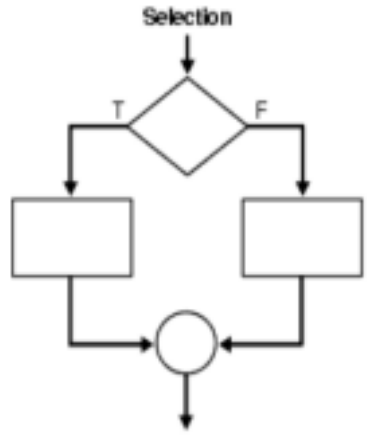
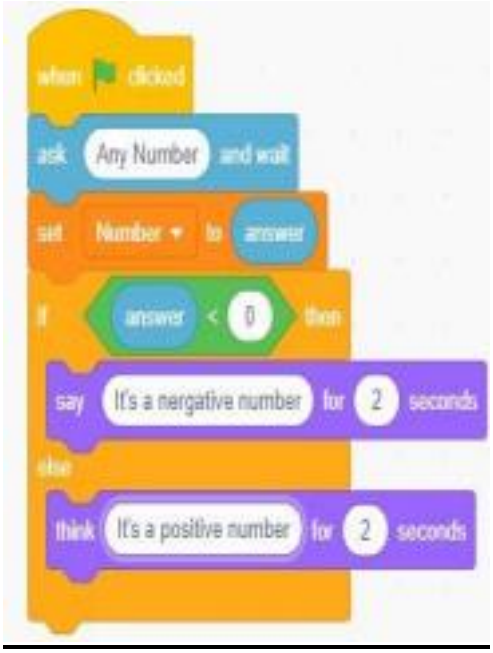
Introduction to Decision and Iterative Structures

Decision Structure: A statement or a set of statements that is executed when a particular condition is "True" and ignored when the condition is "False".

In scratch, we use the following control diagrams for decision structure.

In scratch, we use the following control diagrams for decision structure.

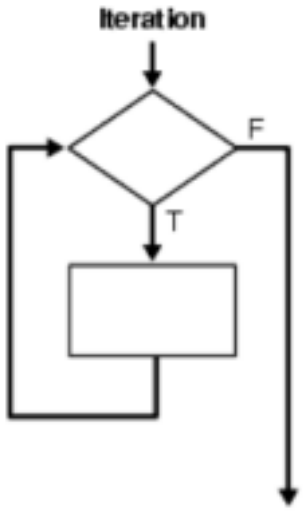
Example 01: Given a number as an input by a user, check if the number is a negative number or a positive number.

Flowchart of Decision Structure	Scratch Diagram	Output
		

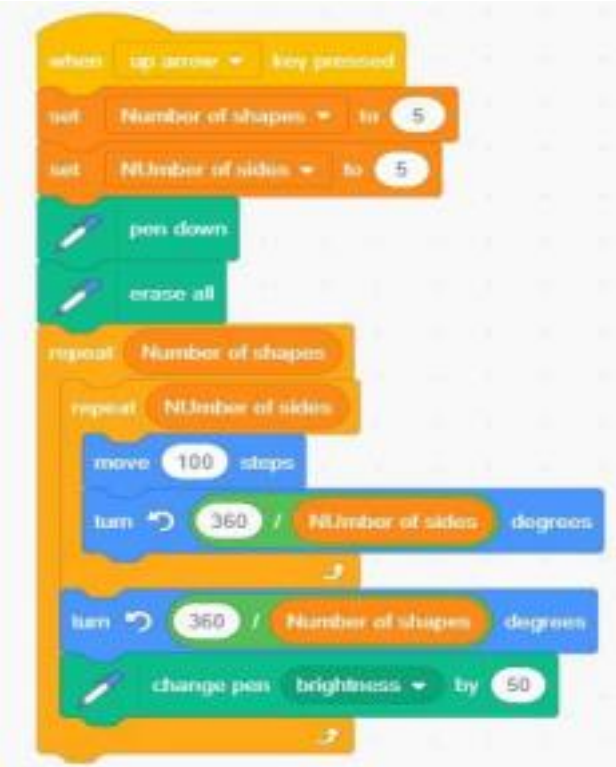
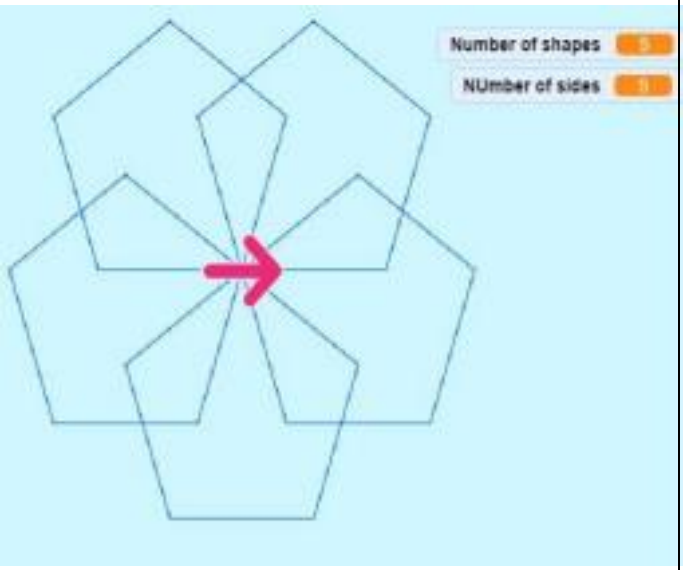
Iterative Structure: The statements that cause a set of statements to be executed repeatedly either for a specific number of times or until some condition is satisfied are known as iteration statements.

In scratch, we use the following control diagrams for iterative structures:

Example 02: Set a counter to 1 and repeat until the given condition is satisfied. In this case, the given condition is counter =10.

Flowchart of Iterative Structure	Scratch Diagram	Output
		

Example 03: **Draw a pentagon with the help of repeat and pen diagrams. Repeat the shape for five times.**

Scratch Diagram	Output
	

EXERCISE

QUESTION#1: Take a number as an input from a user. Check if whether a number is multiple of 5 or not. If it is then print “This number is multiple of 3”, otherwise print “This number is not multiple of 5”.

QUESTION#2: Create a calculator asking for operator (+ or – or * or /) and operands and perform calculation according to the user input.

QUESTION#3: An online shopping store is providing discounts on the items due to the Eid. If the cost of items is more than 1999 it will give a discount upto 50%. If the cost of shopping is 2000 to 4000, a 20% discount will be applied. If the cost of shopping is 4001 to 6000, a 30% discount will be applied. If it's more than 6000 then 50% discount will be applied to the cost of shopping. Print the actual amount, saved amount and the amount after discount.

QUESTION # 4: You are supposed to create a mark sheet. There are total five subjects. Each subject has equal marks i.e., 100, therefore total marks are 500. Take marks of five subjects as an input from the user. Calculate the percentage. If the percentage is below 50, he/she is fail else he/she is pass. Draw a flowchart on your notebook. Convert the flowchart into scratch diagram.

QUESTION#5

Using IF, displays the following menu for the food items available to take order from the customer:

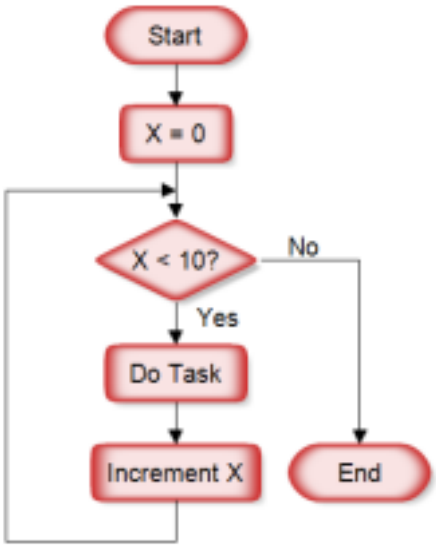
- B= Burger (Rs. 200)
- F= French Fries (Rs. 50)
- P= Pizza (Rs. 500)
- S= Sandwiches (Rs. 150)

The costumer can order any combination of available food. The program first ask to enter the no of types of snacks i.e. 2, 3 or 4 then it ask to enter the choice i.e. B for Burger and then for quantity. The program should finally display the total charges for the order.

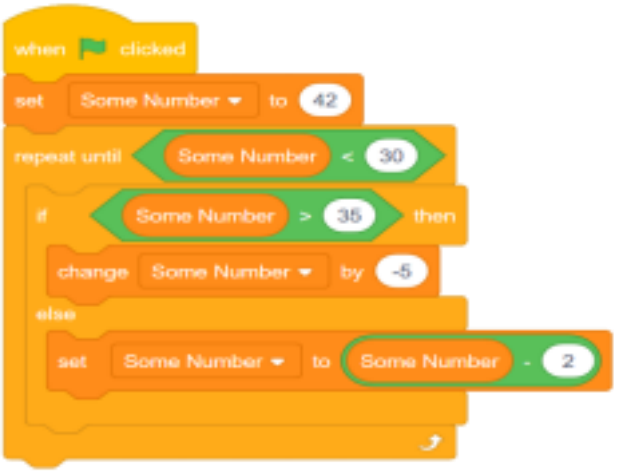
```
            ABC Restaurant Online Order Placement
                          WELCOME!

Please select from the following Menu
B= Burger
F= French Fries
P= Pizza
S= Sandwiches
How many types of snacks you need to order: 2
Enter first Snack you want to order: B
Please provide quantity: 2
Enter second Snack you want to order: P
Please provide quantity: 3
------------------------------------------------------------
You have ordered!
2 Burger (s) value 400 PKR
3 pizza (s) value 1500 PKR
Total: 1900 PKR
Thank you for your order… have a nice day.
```

QUESTION # 6: Given below is a flow chart. Identify the decision and iterative structures in it. Convert the flow chart in to scratch diagram.



QUESTION # 7: Given below is a scratch diagram. Write a description of the diagram as well as draw its flowchart on your notebook.



Good Luck 😊