CL-118 Programming Fundamentals

LAB – 02

Problem solving with decision and iterative structures using Scratch

NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES
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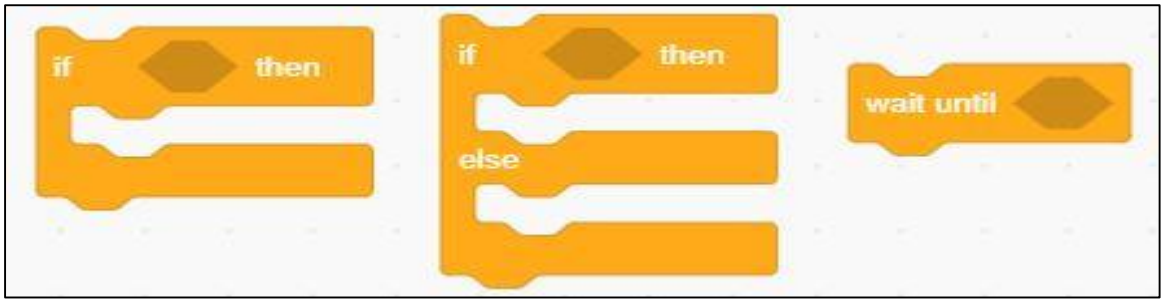
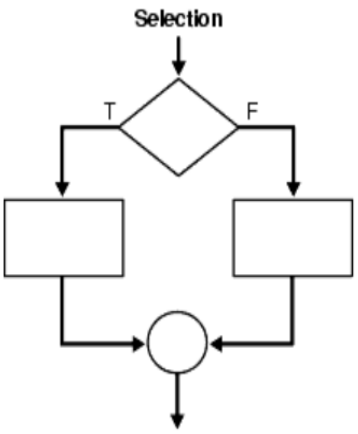
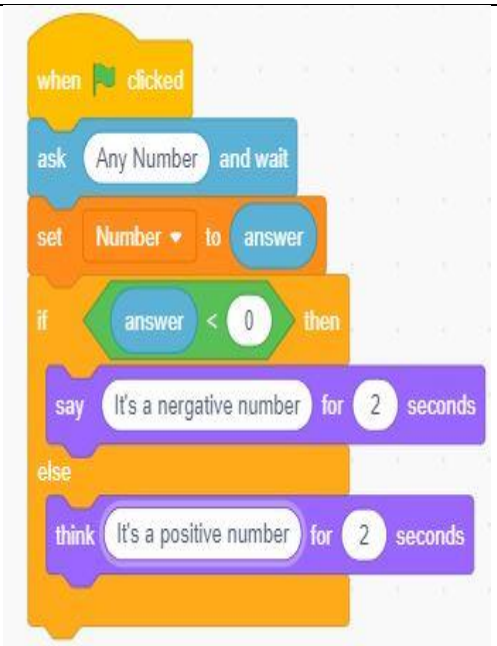
Introduction to Decision and Iterative Structures

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.

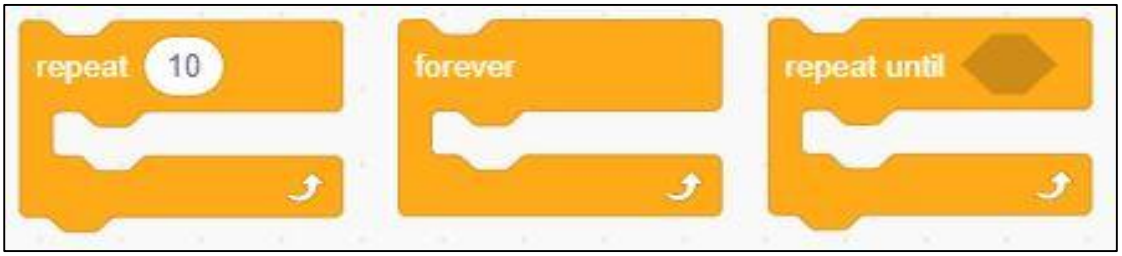


Example: Given a number as an input by a user, check if the number is a negative number or a positive number.

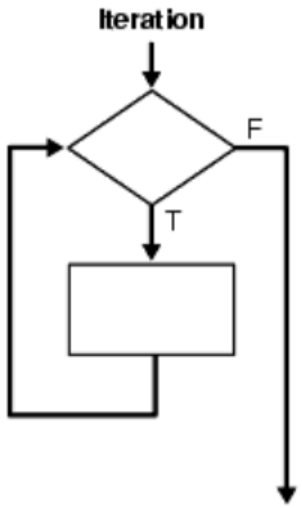
Flowchart of Decision Structure	Scratch Diagram	Output
		

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.

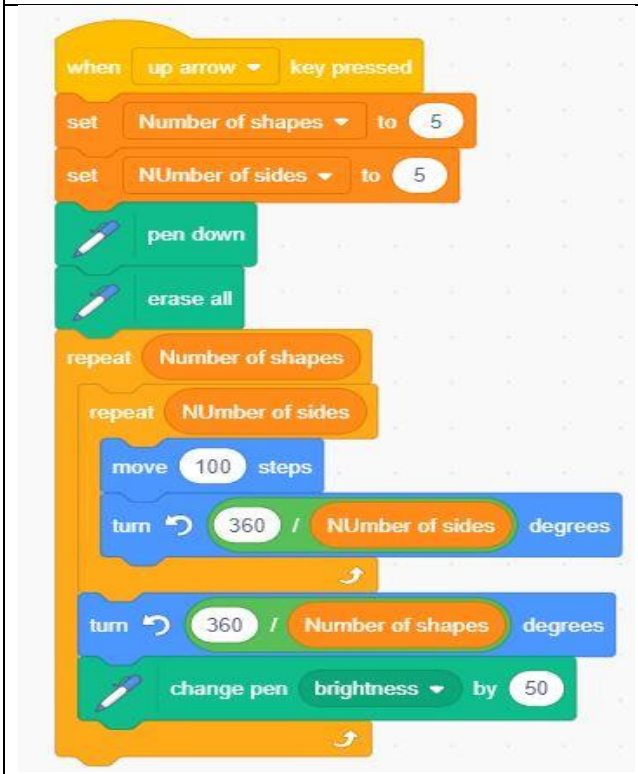
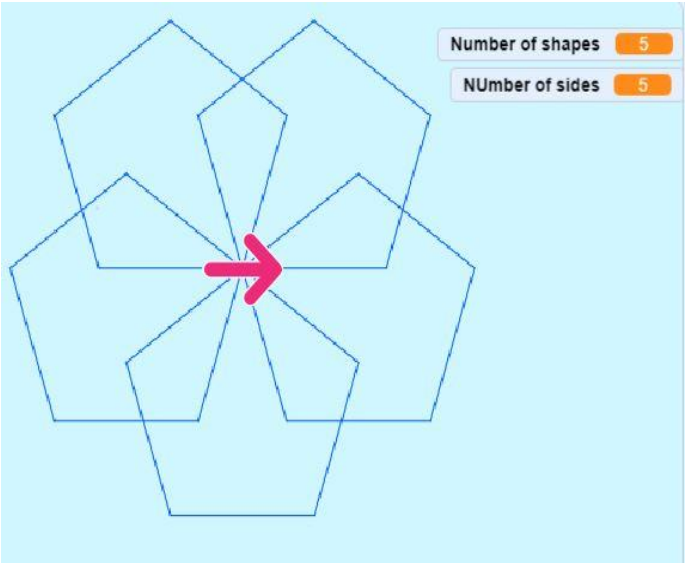
In scratch, we use the following control diagrams for iterative structures:



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

Scratch Diagram	Output
	

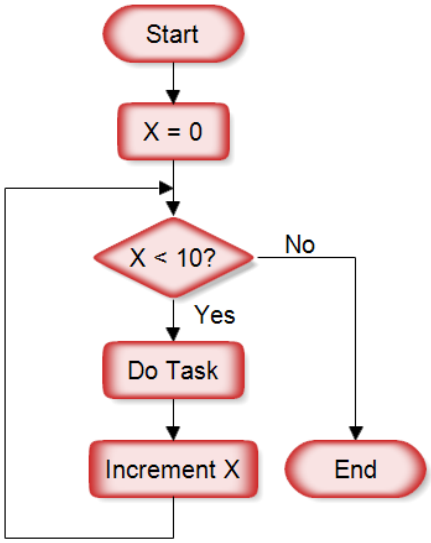
Exercise Questions

QUESTION # 1: Take a number as an input from a user. Check if the number is an even number or an odd number. Draw a flowchart on your notebook. Convert the flowchart into scratch diagram.

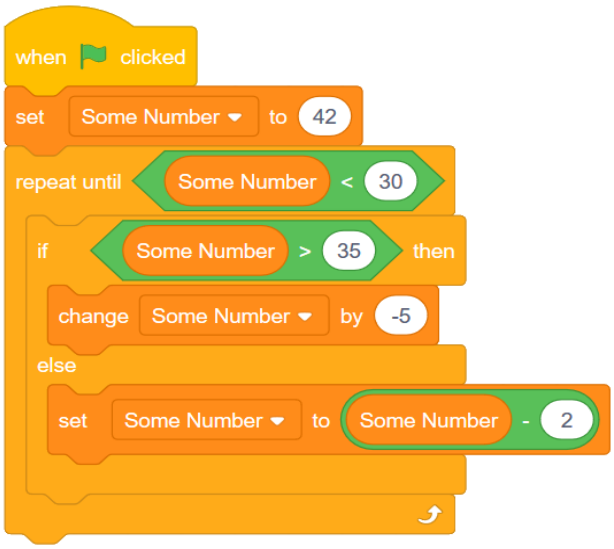
QUESTION # 2: You are supposed to create a mark sheet. There are total five subjects. Each subject has equal marks i.e., 100, therefore total marks are 500. Take marks of five subjects as an input from the user. Calculate the percentage. If the percentage is below 50, he/she is pass else he/she is fail. Draw a flowchart on your notebook. Convert the flowchart into scratch diagram.

QUESTION # 3: Draw a hexagon that has six sides. Repeat the hexagon for the same number of times as of its size.

QUESTION # 4: Given below is a flow chart. Identify the decision and iterative structures in it. Convert the flow chart in to scratch diagram.



QUESTION # 5: Given below is a scratch diagram. Write a description of the diagram as well as draw it's flowchart on your notebook.



QUESTION # 6: Create a scratch program that takes a number from user and prints its table till 20.

QUESTION # 7: Create a scratch program where you display a conversation between two characters. The story should have at least 5 dialogues for each character.

QUESTION # 8: Create a translate application in which user enters a sentence and your program should translate that sentence into any foreign language (e.g. Arabic, French, etc.)

QUESTION # 9: Create a scratch program that takes an alphabet from user and decides whether that alphabet is a vowel or a consonant

Good Luck ☺