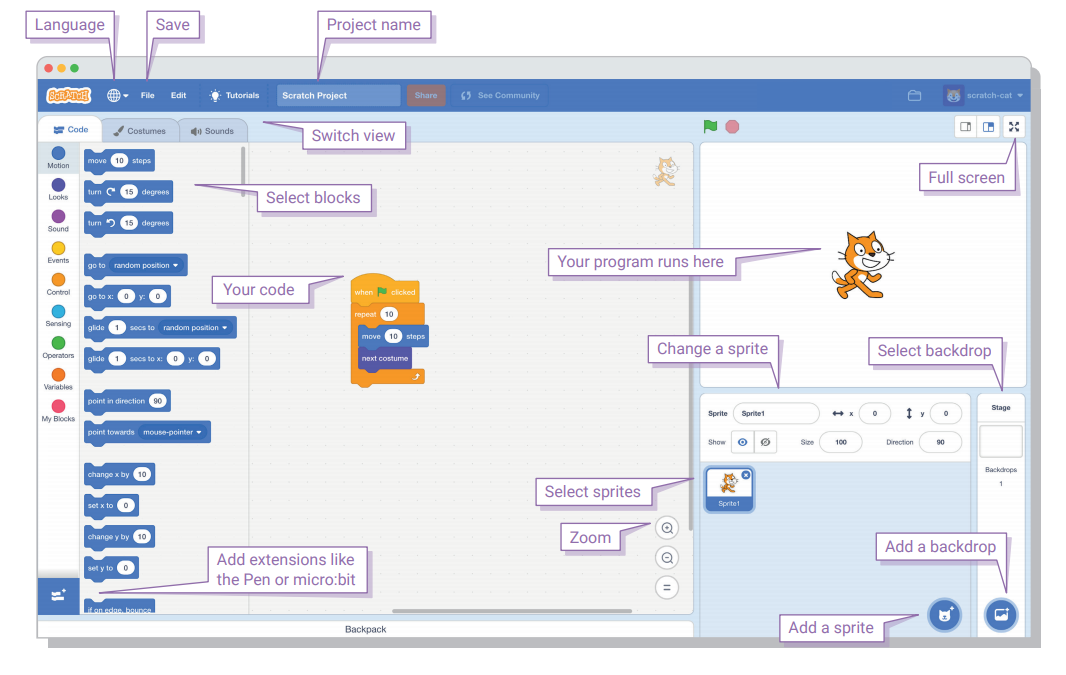
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| **CL-1002 Programming Fundamentals** | **LAB - 01**  **Problem solving with sequential structure using Scratch** | |
| **NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES**  **Fall 2022**  **NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES**  **NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES**  **NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES** | |  |

**Introduction**

Visual Programming Language (VPL) is an application development environment designed on a graphical block-based programming model.

**Scratch Interface**



**Example#1: Writing our first script in a scratch to print “Hello” to the world.**

Graphical user interface, text

Description automatically generatedGraphical user interface, application

Description automatically generated

#include <stdio.h>

int main()

{

printf(“Hello World”);

}

**Example#2: Prompting your Name and printing “Hello” to your Name.**

**Script: Output:**

Text, application, chat or text message

Description automatically generated

Graphical user interface, text, application, chat or text message

Description automatically generatedGraphical user interface, text, application

Description automatically generated

**Example#3: Asking your Name and saying by speaking “Hello” to your Name.**

**Script:**

Graphical user interface, text, application

Description automatically generated

**Example#4: Calculate the hypotenuse of a right-angled triangle with given two sides using the formula.**

A picture containing shape

Description automatically generated

A screenshot of a menu

Description automatically generated with medium confidence**Script:**

Graphical user interface, text, application

Description automatically generated

**Example#5: Setting Grid Backdrop and moving spirit onto the xy-axis and draw square on the screen.**

Graphical user interface, chart

Description automatically generated**Script: Output:**

Calendar

Description automatically generated

**Example#6: Write a script of input two numbers, add two numbers and print the sum of numbers.**

Graphical user interface

Description automatically generated**Script: Output:**

A child standing in front of a black screen

Description automatically generated with medium confidence

**Example#7: Write a script to find an area of circle**

**Script: Output:**

Graphical user interface, text

Description automatically generatedGraphical user interface, application, PowerPoint

Description automatically generated

**Example#8: Conversation between two scripts when clicked on the spirit.**

Graphical user interface, application

Description automatically generated**Spirit#1**

Graphical user interface, text, application

Description automatically generated

**Spirit#2**

Graphical user interface, application, Teams

Description automatically generated

**EXERCISE#1**

**QUESTION#1**Make a simple calculator which performs basic arithmetic operations of mathematics such as addition, subtraction, division, and multiplication using scratch.

**QUESTION#2**

Make a simple temperature converter that converts Fahrenheit into Celsius.

Celsius = ((Fahrenheit-32)\*5)/9

**QUESTION#3**

A bus leaves the university to take students on a field trip. The bus travels 10 kilometers south, 10 kilometers west, another 5 kilometers south and 15 kilometers north with the fuel consumption of 2 liters/km. Using scratch calculate how many kilometers it has covered and how much fuel it has consumed on a field trip?

**QUESTION#4**

Calculate the area for a triangle in which user inputs height and length of a triangle using scratch.

**QUESTION#5**  
Find out coordinates of midpoint using given formula, derived from Pythagorean Theorem and value of X by Quadratic formula using scratch, as follows:

1. Midpoint= ((x2+x1/2), (y2+y1/2))
2. Given (a≠0.)

**QUESTION#6**

For 4 weeks, Waseem volunteered as a helper for swimming classes. The first week, he volunteered for 8 hours. He volunteered for 12 hours in the second week, and another 12 hours in the third week. The fourth week, he volunteered for 9 hours. Using scratch calculate how many hours did he volunteer per week, on average?

**QUESTION#7**

A sweater is on sale for 25% off the original price. The original price is Rs. 5000. Using scratch calculate and print the sale price.

**QUESTION#8**

One of the jobs that Joe Roberts has been given at work is to order special paper for a report for a board meeting. The paper comes in reams of 500 sheets. He always makes five more copies than the number of people that will be there. Joe wants to know how many reams of paper he needs for a meeting. He can order only whole, not partial, reams. Assume the required number of pages will not equal an exact number of reams. Test your solution using scratch with the following data:

The report is 140 pages long.

There will be 25 people at the meeting.

**QUESTION#9**

Ali and Bilal are the friends. Write some greeting conversation in between them when clicked on the spirit.