

# University of mianwali(UMW)

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## Lab Manual Introduction to Information & Communication Technologies

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Class-Section	
Semester	



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# Week-04

## Objectives

After performing this lab, students shall be able to:

- Get familiar with the scratch environment
- Implement basic sequencing, branching and iterations in scratch

## Task List

### Task-1 Practicing with loops & Conditions

Create a word report for this manual.

Open Website: <http://scratch.mit.edu/>

#### Problem #1-Name Animation

Create your own sprite that contains your name. You need to animate it using multiple costumes.

#### Problem #2-Embedded Loop

Try the following loop structures. Which will result in the sprite moving 100 steps? Think about WHY this is happening.



#### Problem #4-Repeat Until

Create an animation containing two sprites. The first sprite should animate until a given event (i.e. touching the edge, touching a sprite, a key is pressed...). After the event occurs, the first sprite should broadcast a message that triggers the animation for the second sprite. For added difficulty have the sprites only show up during their animation, have the stage change and have some music play

#### Problem #5-Loop & Conditional

Using any sprite you'd like, run the following code. Which seems to work the best? Why?



### Question #1-Loops

What are the types of loops contained in Scratch? What are the differences?

### Question #2-No end in sight

If you are given a situation where you want an action to repeat, but you don't know how long it should repeat for, which loop is the best structure to use? Why?

### Question #3-Forever Loops

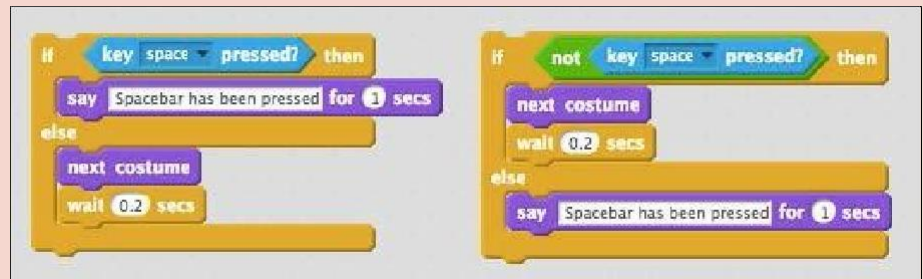
Does the following loop structure work? Does it make sense? Why or why not?

### Question #4-Sprite Communication

How can sprites "know" when to begin an action? Is there more than one way?

### Question #5-Conditionals

Are the following code snippets equivalent? Why or why not?



## Task-2 Practicing Math & Variables

### Problem #1-Quick Costume Change

Create a simple animation using the built in costumes for any sprite you choose. You should use a forever loop so that the animation won't end. Add another sprite to act as a button. Name this sprite "Faster". Add another sprite that also acts as a button. Name this sprite "Slower". Using a variable called "speed", have the faster button speed up the animation and the slower button slow it down.

### Problem #2-A.I.

Build a program where a sprite asks for the following information (the answers should all be stored as variables)

- Name
- Grade
- Favorite Activity

- Favorite Food

The sprite should then have a 'conversation' with another sprite (who wasn't on the screen until now) about the cool person they just met.

### Problem #3-Distance Formula

Write a program that takes two ordered pairs of points and calculates the distance between them. Hint: You might want to use 4 variables. Test your program with a known distance. For example, the ordered pairs (2, 3) and (5, 7) should have a distance of 5 units.

### Problem #4-Pump up the volume

Create a dance party where at least three sprites are dancing. There should be music in the background. Add a sprite that controls the volume of the music. If the music gets too loud, determined by you, the police should come and everyone run off the screen. Note, you will need a conditional (if statement) in a forever loop to determine if the volume is too high

### Problem #5-Metric Converter

Create a program that takes a measurement in feet and inches and converts it to metric units of mm, m and km. You should have at least 5 variables (you might want 6). The sprite should ask the user for both feet and inches and store these values as separate variables. Then after performing some calculations, the values for mm, m and km should be 'set to' appropriate values. You should check your numbers to make sure your output is correct.

### Question #1

Are variables in computer programming the same as variables in math class? Why or why not?

### Question #2

When creating a variable, what are the two types of scope a variable can have? That is, what can it affect. (Think about your options as you make a variable)

### Question #3

How many values can a variable store at one time?

### Question #4

What will the following code snippet do? Explain why it doesn't work as intended.



### Question #5

Given the following code snippet, explain what is happening.

