

Electrical Engineering Department - ITU
CS101L: Computing Fundamentals & Programming Lab

Course Instructor: Dr. Shahzad Ahmad	Dated: 07/09/2022
Lab Engineer: Muhammad Usama Riaz	Semester: Fall 2022
Session: 2022-2025	Batch: BSEE2022

Lab 2. Learn How to Write an Algorithm & Drawing Flowcharts

Name	Roll number	Report (out of 100)	Scaled to 10	Total (out of 10)
OBAID-UR-REHMAN	BSEE22045			

Checked on: _____

Signature: _____

Objective

The goal of this handout is to learn about writing an algorithm and drawing flowcharts.

Equipment and Component

Component Description	Value	Quantity
Computer	Available in lab	1

Conduct of Lab

1. Students are required to perform this experiment individually.
2. In case the lab experiment is not understood, the students are advised to seek help from the course instructor, lab engineers, assigned teaching assistants (TA) and lab attendants.

Theory and Background

A programming **algorithm** is a procedure or formula used for solving a problem. It is based on conducting a sequence of specified actions in which these actions describe how to do something, and your computer will do it exactly that way every time. An algorithm works by following a procedure, made up of inputs.

Flowchart is a graphical representation of an algorithm. Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols which are connected among them to indicate the flow of information and processing. The process of drawing a flowchart for an algorithm is known as “flowcharting”.

Lab Tasks

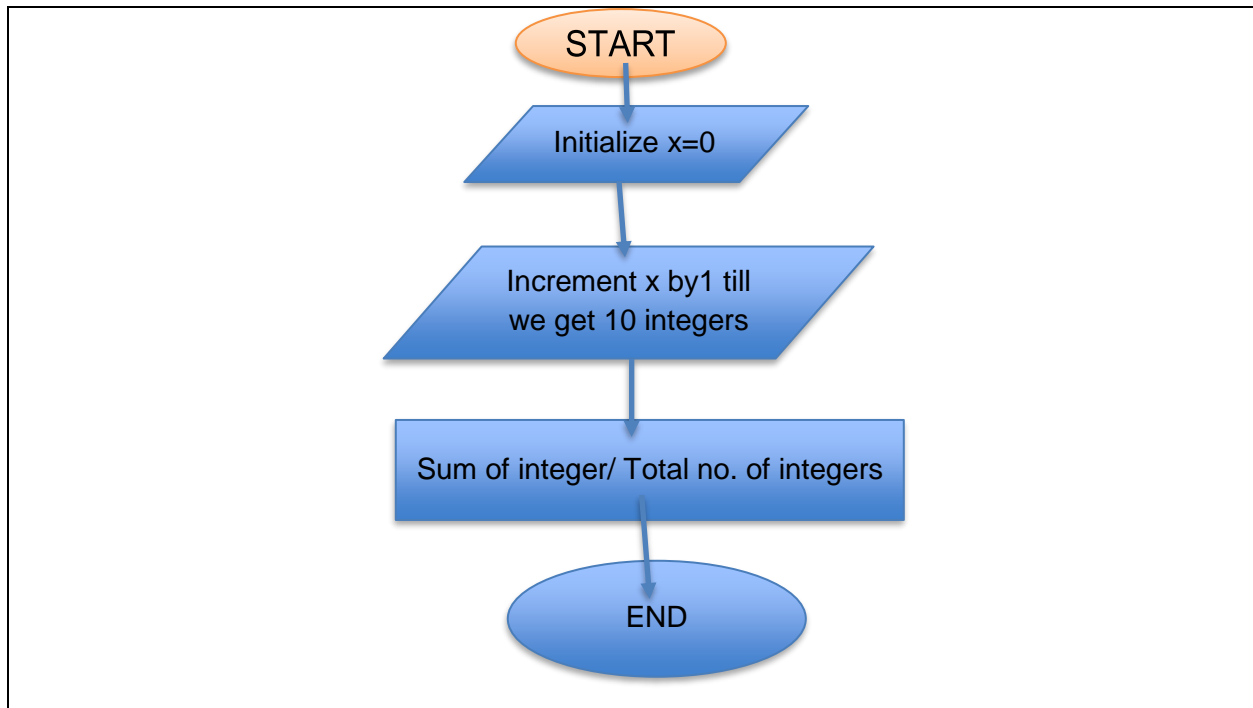
Task A

Write an algorithm to take 10 integers as input, find the average, then display the average as output.

```
STEP:1  Take x=0
STEP:2  Increment x by 1 till we get 10 integers
STEP:3  Find average using formula (sum of integers/total no. of integers)
STEP:4  Print average as output
STEP:5  End
```

Task B

Draw a flowchart for task A.



Task C

Push the repository on GitHub and paste the screen shot below.

Assessment Rubric for Lab

Method for assessment:

Lab reports and instructor observation during lab sessions. Outcome assessed:

- a. Ability to conduct experiments, as well as to analyze and interpret data (P)
- b. Ability to function on multi-disciplinary teams (A)
- c. Ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (P)

Performance metric	Task	CLO	Description	Max marks	Exceeds expectation	Meets expectation	Does not meet expectation	Obtained marks
1. Realization of experiment (a)	1	1	Functionality	40	Executes without errors excellent user prompts, good use of symbols, spacing in output. Through testing has been completed (35-40)	Executes without errors, user prompts are understandable, minimum use of symbols or spacing in output. Some testing has been completed (20-34)	Does not execute due to syntax errors, runtime errors, user prompts are misleading or non-existent. No testing has been completed (0-19)	
2. Teamwork (b)	1	3	Group Performance	5	Actively engages and cooperates with other group member(s) in effective manner (4-5)	Cooperates with other group member(s) in a reasonable manner but conduct can be improved (2-3)	Distracts or discourages other group members from conducting the experiment (0-1)	
3. Conducting experiment (a, c)	1	1	On Spot Changes	10	Able to make changes (8-10)	Partially able to make changes (5-7)	Unable to make changes (0-4)	
	1	1	Viva	10	Answered all questions (8-10)	Few incorrect answers (5-7)	Unable to answer all questions (0-4)	
4. Laboratory safety and disciplinary rules (a)	1	3	Code commenting	5	Comments are added and does help the reader to understand the code (4-5)	Comments are added and does not help the reader to understand the code (2-3)	Comments are not added (0-1)	
5. Data collection (c)	1	3	Code Structure	5	Excellent use of white space, creatively organized work, excellent use of variables and constants, correct identifiers for constants, No line-wrap (4-5)	Includes name, and assignment, white space makes the program fairly easy to read. Title, organized work, good use of variables (2-3)	Poor use of white space (indentation, blank lines) making code hard to read, disorganized and messy (0-1)	
6. Data analysis (a, c)	1	4	Algorithm	20	Solution is efficient, easy to understand, and maintain (15-20)	A logical solution that is easy to follow but it is not the most efficient (6-14)	A difficult and inefficient solution (0-5)	
7. Computer use (c)	1	2	Documentation & GitHub Submissions	5	Timely (4-5)	Late (2-3)	Not done (0-1)	
Max Marks (total):				100	Obtained Marks (total):			

Lab Engineer Signature: _____