

MODULE CODE: ACCC4001_LON
Computational Thinking

YOU HAVE 4 HOURS TO FINISH THE TASK. START AT 10 AM AND NEED TO SUBMIT IT BY 2PM ON MOODLE USING SPECIFIED LINKS.

ANSWER **ALL** QUESTIONS in PART 1

ANSWER **ANY** THREE in PART 2

Please read the guidance on how to submit before starting your test. The guidance has been mentioned after the questions and on Moodle.

PART 1

Question 1

- a. You have been selected to program a new robot intended to create hot drinks and a basic sandwich (toast the bread for a minute, apply jam and cut into two triangular pieces). The robot is capable of following simple, tea and coffee-oriented commands and basic sandwich preparation precisely, but has no understanding on either of the processes, or the fundamental principles, which underpin it (e.g. that a kettle requires power). The robot has access to the following items:

- Kettle (initially unplugged)
- Toaster (initially unplugged)
- Tea bags
- Unopened sliced bread packet
- Unopened jar of jam
- Jar of ground instant coffee
- 1L carton of milk
- Unopened bag of sugar
- Knife
- 1 metal tea spoon
- 1 large mug
- Access to a sink for water and an electrical socket for power

You are required to give the robot the set of instructions (algorithm) necessary to successfully make a cup of milky coffee or tea with milk, with 1 teaspoon of sugar as user choice. Also, give the instructions to make a sandwich, which requires toasting the bread slices, apply the jam. Each instruction should be on a new line. Ensure that your instructions are in a logical order and no steps are missed; while highly capable of following instructions, the robot cannot solve problems independently.

(15 marks)

- b. Write an algorithm to check whether the number is positive or negative.

(10 marks)

Question 2 (15 marks)

Draw a flowchart to find which number is greatest among three numbers.

(15 marks)

PART 2 (ANSWER ANY THREE)

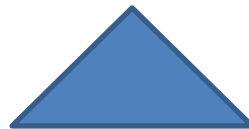
Question 1

(20 marks)

Using Python with turtle, draw the following shape:

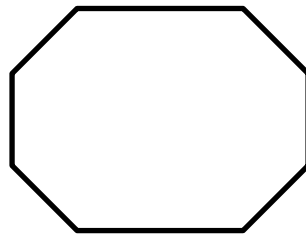
- a. A triangle filled with blue colour

(10 marks)



- b. An Octagon

(10 marks)



Question 2

(20 marks)

The level 4 students are taking three modules such as Network Principles, Computational Thinking and Academic Skills. To move to next level, students must pass all the modules by scoring at least 40 in each module.

Write a program in Python to get the student name and the marks of three modules as input and check whether the student is eligible to move to next level or not. Print the name of the student and the student's result (eligible to move to next level or not) as output.

Eg. If a student scored 43 in Network Principles, 59 in Computational Thinking and 64 in Academic Skills, based on the condition given above, the student has passed all the three modules and hence moved to next level.

Question 3

(20 marks)

Write a program in Python that uses a loop to print 1 to n, where 'n' is a number given by user as input. Instead of printing the numbers, if the number is even, then divide it by 2 and prints the result. If the number is odd, then the program multiplies it by 3 and print the result.

For eg 5 is given as input, then the output should display, as below.

3
1
9
2
15

Question 4

(20 marks)

Create the following list in python:

Humidity = [88,45,63,88,21,39,77,89].

Use the list functions available to do the following:

1. Display the created list.
2. Append 50 to the list.
3. Sort the list in descending order and display the modified list.
4. Display number of times 88 occurs in the list.
5. Create another list called 'Temperature' and copy the elements 45,63,88,21 and 39 from Humidity list to newly created list Temperature.

GUIDANCE TO SUBMIT

Part 1:

Question 1: Write an algorithm clearly to perform the required task.

Question2: Draw the flowchart (you could use any software tools, or you could draw in a paper with pen and scan it or take a picture in your phone) Attach the flowchart in the Word document.

If you are using online compiler, please copy the code and paste it in MSWord. Also, provide the screen shots of your code and output attached on the MS Word file.

Part 2:

If you have problems with your Python, use online compiler
https://repl.it/languages/python_turtle

Use Python to answer all the programming questions in task 2. Create a folder and name it in the format **yourstudentID_COT**. Save your files in the folder created.

Submission Details:

Before submitting, ensure your folder has MSWord file (algorithm and flowchart and screen shots if any) and Python files. Zip your folder and using the Advance Upload, please upload your **zipped** folder, **yourstudentID_COT on Moodle**.

Feedback will be given on Moodle.