

ASSIGNMENT BRIEF

HTU Course No: 10200100

HTU Course Name: Fundamentals of Computing

BTEC UNIT No:

BTEC UNIT Name:

Version: 2



Assignment Brief

Student Name/ID Number/Section	
HTU Course Number and Title	10200100: Fundamentals of Computing
BTEC Unit Number and Title	Not Available
Academic Year	Spring 2019/2020
Assignment Authors	Eng. Malik Al-Louzi & Eng. Atheer Al-Shaggah
Course Tutor	
Assignment Title	Development of Hospital Emergency Management System for Coronavirus emerged COVID-19 Crises.
Assignment Ref No	Assignment 1
Issue Date	3/5/2019
Formative Assessment dates	17/5/2020 – 30/5/2020
Submission Date	Part 1: Thursday, June 4, 2020 (23:00 PM) Take home Part 2: (Sunday, June 7 2020 -Thursday, June 11 2020) In class
IV Name & Date	Eng. Ali Al-Omari 12/5/2020

Submission Format

This assignment consists of two parts: take-home part and in-class part. You must complete both parts and submit them according to the following guidelines:

Take-home part

- You are required to submit a well formatted report providing complete answers to all tasks.
- If a schematic, diagram or photo is copied, the source must be referenced properly (use IEEE referencing style). Quotations are not allowed by any means. Only re-wording with proper referencing is accepted. Failing to follow these instructions leads to rejecting the related work and/or penalization due to plagiarism.
- If you commit any kind of plagiarism, you will be given an ‘unclassified’ grade.
- Your report should be written in 12pt font for the answers, 14pt for headers, “Times New Roman” font style, single spaced pages, submitted in PDF or MS Word format and should not exceed 10 pages of combined text, figures, tables, diagrams, schematics, and screenshots to support your answers when necessary. Include page numbers on your pages, but you do not need to count your title page. Please stick to this format and limit.
- You must work your own program representing your ideas, where working with your colleagues is not a teamwork, it is a kind of plagiarism.
- You must submit a **Source File** for the program you developed (extension should be .c like

YourName_FOC.c). The source file should be **fully commented**. All your work of coding and compilation should be done using **Ubuntu and gcc** compiler only.

- **Sample Runs:** Screenshots capturing the resulting output files when different input files are used must be included in the report. (**NOT photos of the screen by the camera**).
- The **student declaration form** attached to this assignment brief (use electronic signature).
- Soft-copy submissions are only allowed, you are required to upload your submission files to the university's eLearning system through (<https://elearning.htu.edu.jo/>) within the submission date and time stated above. **NO SUBMISSION by EMAIL and NO LATE SUBMISSIONS WILL BE ACCEPTED**. Failing to follow this guideline may result in an 'unclassified' grade.

In-Class part

- In-class assessment will be one to one online oral discussion between you and your instructor on Microsoft Teams, which includes designing, developing, debugging, analyzing, and evaluating the code and algorithm developed in the take home part.
- The attendance of the oral assessment is mandatory in the date and time determined by your instructor (up to 30 minutes) within the period time stated above and be ready to open your camera from beginning of the assessment.
- Answering all tasks in the report with the code will be evaluated through the oral assessment so any question in the oral assessment for any criteria is not answered in the required level that mean you will lose that criteria, even though you answered it in the report.
- You must sign the witness form that your instructor will fill up during the discussion to complete the oral assessment.

Unit Learning Outcomes

LO1 Discuss the basic concepts of computer hardware, software and operating systems, with the basic relation between them, taking C commands as an example.

LO2 Implement a full program in C with identification of the three kinds of control structures: sequence, selection, and repetition, understanding the capabilities of implementing C codes that capable to deal with functions.

LO3 Understanding the basic concepts of pointers in C with implementation of arrays and dealing with files. In addition to the role of C programming as a powerful tool to communicate between devices and manipulate their data.

Assignment Brief and Guidance

Scenario 1

You are an intern in the information technology department in a hospital within a team of computer and system analyst engineers. Regard the crises of the emerging Coronavirus COVID-19 the hospital needs to develop its system in all departments in terms of sterilization mechanisms, scheduling appointments, receiving patients, cases, and conducting tests for Coronavirus. Your role in the team is to develop the management system for the emergency in the hospital that manage the people who visit the emergency and might be infected with the emerging Coronavirus COVID-19.

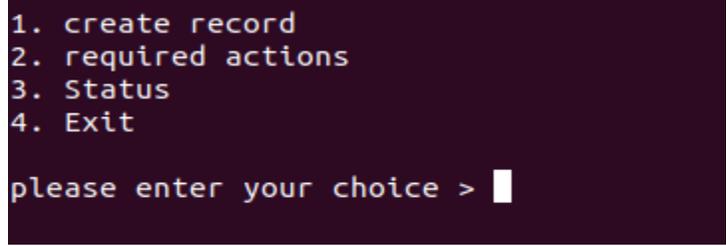
Task 1

Implement your steps to solve this problem (Task 2 to Task 5), by drawing a flowchart showing that in visual representation to document the management system for developing purposes in the future.

Task 2

The management system must be user friendly, which allow the user to choose the option for the required operation from a menu list, this menu list must contain the following options, and as shown in the sample figure 1:

- Create record.
- Suggested required actions.
- Daily status report.
- Exit



```
1. create record
2. required actions
3. Status
4. Exit

please enter your choice > █
```

Figure 1: Sample Run of the menu list

Note: Use function to print out this menu, and this function should return the selected choice. Be aware that if the user input invalid choice you should warn him, and the menu should be shown again. Also, the suggested required actions and the daily status report options are not valid choices unless the user create correct record, as shown in figure 2.

```

1. create record
2. required actions
3. Status
4. Exit

please enter your choice > 5
wrong choice

1. create record
2. required actions
3. Status
4. Exit

please enter your choice >

1. create record
2. required actions
3. Status
4. Exit

*** create record first ***

1. create record
2. required actions
3. Status
4. Exit

please enter your choice >

```

Figure 2: Sample of Runs for warning note

Task 3

The first option is to create a record for the people who will visit the emergency, use function to input their data, which must include the following: **Name (First name) i.e (Ahmad), ID (4 digit integer number) i.e (1234) , Age, history (chronic diseases), Temperature, and breathing difficulties** of these people. Then you need to measure the probability of these people who are infected by COVID-19, depending on these conditions in table 1 :

Table 1: Percentage of Infecting by COVID-19 with Conditions

Percentage that the person might be infected by COVID-19	Age	History	Temperature	Breathing Difficulties
75%	More than 60 years or less than 16 years	Yes	More than 37	Yes
50%	More than 60 years or less than 16 years	No	More than 37	Yes
25%	Less than 60 and more than 16	No	More than 37	Yes
5%	Any age	Yes	37	No

Based on the percentages you have you need to show this percentage of infecting by COVID-19 with an image of status bar, as shown in the figure 2. (Use showArray function with the library foc_sp20.h you will find it on eLearning)

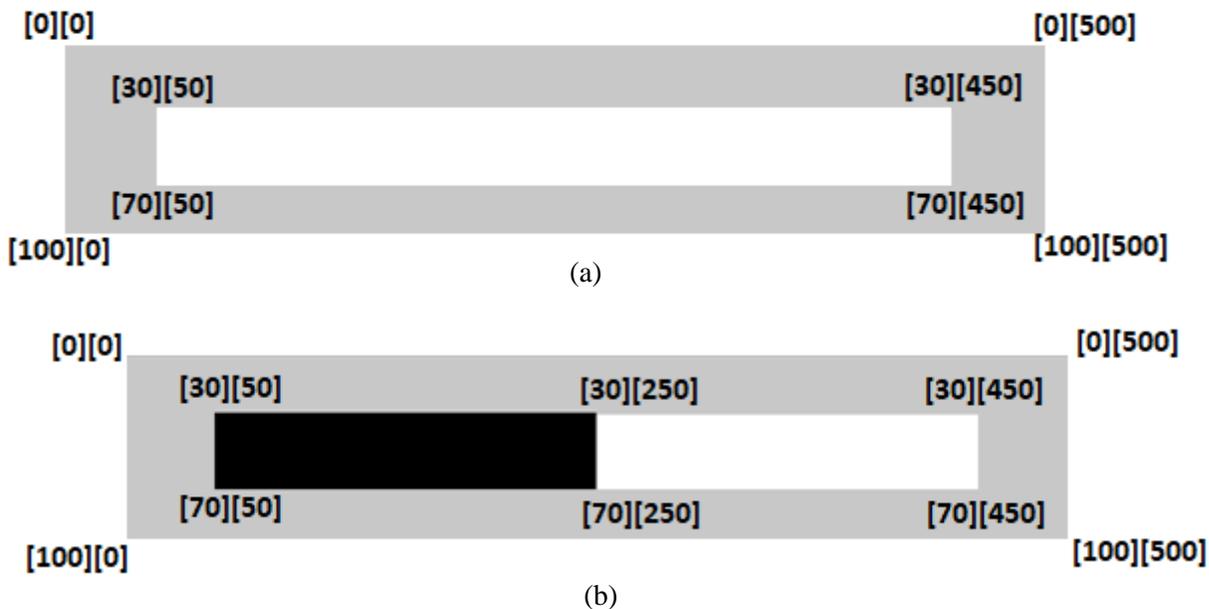


Figure 3: Status Bar of the percentages of infecting with [rows][columns] specifications: (a) Empty status (b) 50% status.

Then you need to write each case that was measured in a file in one line in this representation:

Name, ID, age, history status, temperature, breathing difficulties, and the probability of infection by COVID-19, as shown in figure 4.

Note that the record function must return the probability of infection by COVID-19 value (75%, 50%, 25%, or 5%).

```
khalid 7701 39.000000 72 1 0.750000
ali 1414 38.000000 41 0 0.250000
essa 5012 39.000000 14 0 0.500000
rana 7122 37.800000 15 0 0.500000
```

Figure 4: Results representation example in the file

Task 4

The second option is the required action for each probability case, where you need to use function to implement it as follows:

1. **75%** case: you need to give the system an alarm message that will be send to the ministry of health include “This person must be moved to isolation hospitals for coronavirus cases”.
2. **50%** case: you need to put this person in the isolation at your hospital. This case you need to calculate the number of available beds, based on the total beds and the used beds in the hospital which are represented respectively in text file that will be provided for you (You will find it with the assignment on eLearning), if there are available beds you should modify the text file values by increasing the used beds by one, and if there is no available bed you need to show a warning message to notify that.
3. **25% and 5%** cases: you need to give the user indication message that the person must isolate himself in the home and call if observing any symptoms.

Task 5

The third option is the daily status report for the hospital, you need to use function that calculate the following results based on the records that have been saved in the file that you created in the first option, and print out them on terminal, as shown in figure 6:

1. Total number of cases that visit the emergency.
2. Percentage of each case (75%, 50%, 25% and 5%) to the total number.
3. Average of the age for all cases.
4. Average of temperature for all cases.

```
1. create record
2. required actions
3. Status
4. Exit

please enter your choice > 3

the total visitors = 4
the percentage of 75% = 0.250000
the percentage of 50% = 0.500000
the percentage of 25% = 0.250000
the percentage of 5% = 0.000000
the average of ages = 35.500000
the average of temperatures = 38.450000
```

Figure 5: Sample run example for daily status option

Task 6

For cases with 75% probability of COVID-19, you are required to send an alarm message to the Ministry of Health. For this task you can use one of two devices:

- Device A is 20 meters away, it can be connected using USB
- Device B is 10 meters away, it can be connected using serial port

What will be your choice and why? Draw a simple block diagram for your choice

Learning Outcomes and Assessment Criteria			
Learning Outcome	Pass	Merit	Distinction
<p>LO1: Discuss the basic concepts of computer hardware, software and operating systems, with the basic relation between them, taking C commands as an example.</p>	<p>P1 Identify and discuss the basic hardware and software of the computer.</p> <p>P2 Identify the basic commands of the Ubuntu operating system and interact with the terminal.</p>	<p>M1 Explore and determine the basic structure of any C program file.</p>	<p>D1 Critically analyse any C command and relate it with the machine cycle.</p>
<p>LO2: Implement a full program in C with identification of the three kinds of control structures: sequence, selection, and repetition, understanding the capabilities of implementing C codes that capable to deal with functions.</p>	<p>P3 Implement problem solving decisions in algorithms and introduce structure charts as a system documentation tool.</p> <p>P4 Identify the C syntax of sequence, selection, and repetition and when to use each statement type.</p> <p>P5 Identify the structure of functions with passing information and get data if needed.</p>	<p>M2 Solve real life problems using control structures in C language integrated with functions.</p>	<p>LO 2 & 3 D2 Critically evaluate the source code that solve real life problem implementing the functions, arrays, and files following the code standards and best practices.</p>
<p>LO3: Understanding the basic concepts of pointers in C with implementation of arrays and dealing with files. In addition to the role of C programming as a powerful tool to communicate between devices and manipulate their data.</p>	<p>P6 Explore pointers role in referencing variables, and how it is reflected in the memory.</p> <p>P7 Implement arrays as one dimensional or two dimensional and dealing with any operation on them.</p> <p>P8 Explore the fundamentals of communication between devices.</p>	<p>M3 Implement the effectiveness of arrays in real applications with usage of functions.</p> <p>M4 Identify streams in C and their relationship to deal with files.</p> <p>M5 Introduce a block diagram to solve a real-life problem in communication between devices.</p>	

STUDENT ASSESSMENT SUBMISSION AND DECLARATION

When submitting evidence for assessment, each student must sign a declaration confirming that the work is their own.

Student name:		Assessor name:	
Student ID:			
Issue date: 3/5/2020	Submission date: 4/6 /2020	Submitted on:	
Programme:			
HTU Course Name: Fundamentals of Computing BTEC UNIT Title *: NA			
HTU Course Code: 10200100		BTEC UNIT Code: NA	
I AM REPEATING THIS UNIT*:		(YES)	(NO)

Plagiarism

Plagiarism is a particular form of cheating. Plagiarism must be avoided at all costs and students who break the rules, however innocently, may be penalised. It is your responsibility to ensure that you understand **correct referencing practices**. As a university level student, you are expected to use appropriate references throughout and keep carefully detailed notes of all your sources of materials for material you have used in your work, including any material downloaded from the Internet. Please consult the relevant unit lecturer or your course tutor if you need any further advice.

Student declaration

I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.

Student signature:

Date: