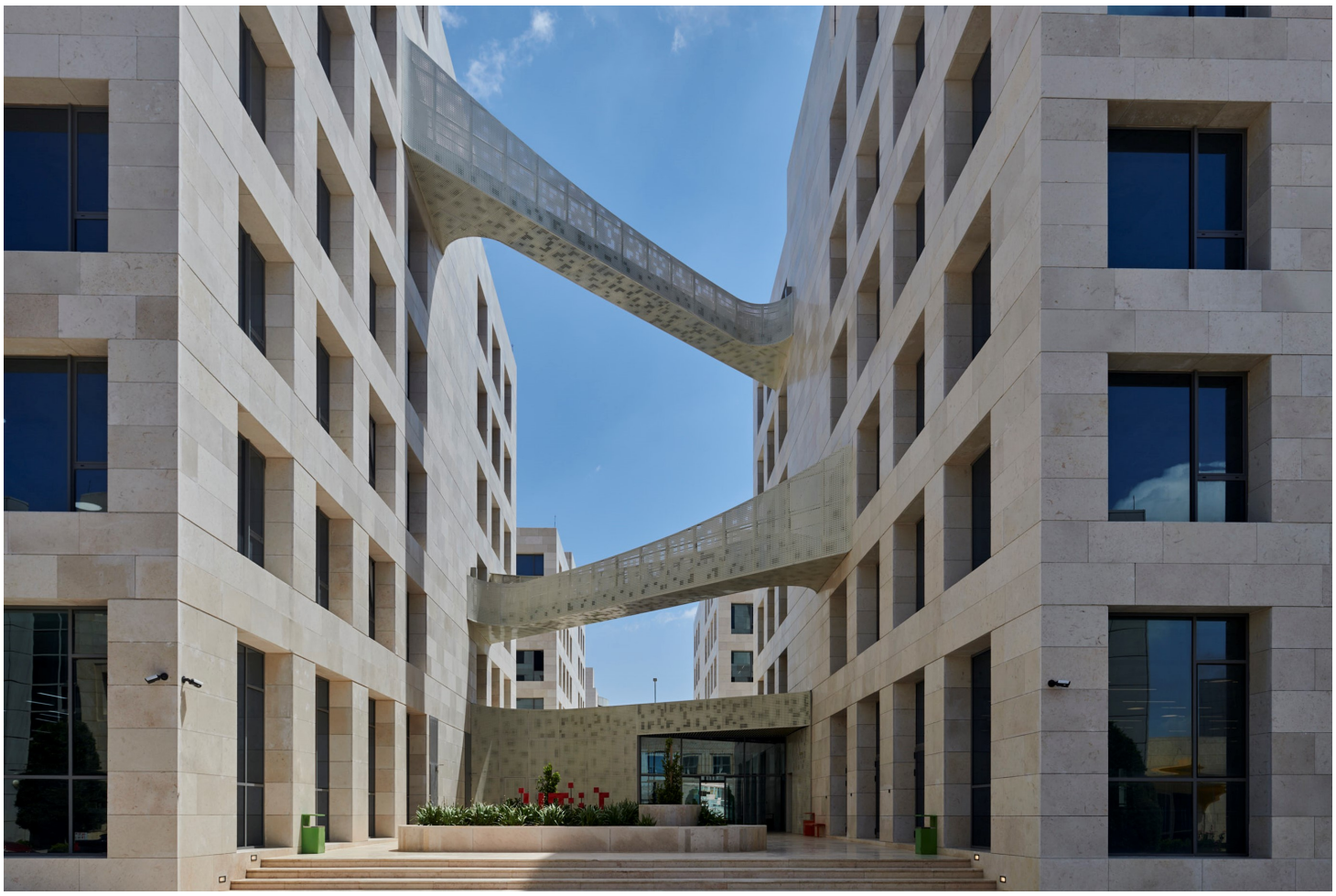
جامعة الحسين التقنية
Al Hussein Technical University

ASSIGNMENT BRIEF

HTU Course No: 40303130	**HTU Course Name:** Fundamentals of Computing
BTEC Unit Code:	**BTEC UNIT Name:**

Version: 3



Student Name/ID Number/Section	
HTU Course Number and Title	40303130 Fundamentals of Computing
BTEC Unit Code and Title	
Academic Year	2023-2024 Fall
Assignment Author	Abeer Malkawi, Batool Alarmouti , and Mohammad Yahia
Course Tutor	Abeer Malkawi - Sultan Alrushdan – Mohammad Yahia - Balqees Aldabaibeh - Mariam Biltawi - Orwa Aladaileh - Batool Alarmouti - Malek Louzi - Bassam Al-Kasasbeh - Umar Alkafaween - Hana' Rashid - Janah Emeeshat - Qusai Ismail
Assignment Title	FoC Assignment – Part 4
Assignment Ref No	1
Issue Date 16/11/2023	19/01/2024
Formative Assessment dates	From 23/11/2023 to 11/01/2024
Submission Date	26/01/2024
IV Name & Date	Dania Alsa`id 15/11/2023

Submission Form

Part4:

- The Assignment contains three empty C files titled problem1.c, problem2.c, and problem3.c. In addition to these files, there are two input text files titled Info.txt and words.txt.
- Students should use the previous files, without changing the names, in solving the problems described below.
- The student must submit **three C source code** files. **No need to submit the input and output text files.**
- Submission should be done through the University's e-learning portal.
- All students must sign a declaration form titled “DECLARATION FORM” and submit it through the University’s e-learning portal.

Unit Learning Outcomes

LO1 Discuss the basic concepts of computer hardware and software, and basic Ubuntu commands.
LO2 Implement full programs in C that employ input/output statements, and three kinds of control structures: sequence, selection, and repetition.
LO3 Use and build functions to abstract C programs and reuse code where possible.
LO4 Use one-dimensional and two-dimensional arrays effectively to represent data and solve real-life problems.
LO5 Understand the basic concepts of pointers in C.
LO6 Process text files using the C programming language.

Assignment Brief and Guidance

You are working in a programming company, and you were asked to solve the following problems:

Problem 1 Solve this problem inside the file problem1.c

Write a C program that reads a string of size 100 and then deletes vowels. Your program should adjust the index of the deleted letter by moving all the next letters for one index. Vowel letters are the uppercase and lowercase of: **a, e, i, o,** and **u.**

Sample runs:

Input	Output
What is your name?	Wht s yr nm?
Dr. Abeer Malkawi	Dr. br Mlkw
Hello to Fundamental of Computing	Hll t Fndmntl f Cmptng
Wish You Good Luck in This Final Assignment	Wsh Y Gd Lck n Ths ssgnmnt

Problem 2 Solve this problem inside the file problem2.c

Write a C program for a word game that reads data from an input file titled **words.txt** and prints results on the screen. The following figure shows the structure and content of the file. This file contains 9 lines. The program reads a number between 1 and 9, and if the user enters an invalid number, the program should display the message **Invalid input.** and terminates. If the user enters a valid input, the program matches the entered number with the line id from the file. Then the program reads and prints the second number following the id, this number represents the length of the word that the program should skip, and then, the program will print the description after this word. For example, if the user enters 2, the program should print 4, and the description: **a printed work consisted of pages.** Finally, the user should enter a word that matches the number of characters and description, if the number of characters is not the same, the program should **print Wrong number of characters.** and terminate the program. Otherwise, the program should compare the word in the file and the word taken from the user, if they match, the program should print **Correct answer.**, otherwise the program should print **Wrong answer**, and terminate the program. You must solve this problem using the string topics you have learned.

Sample runs:

Input	**Output**
2 books	4 **a printed work consisted of pages.** Wrong number of characters.
9 Pasta	5 **popular Italian dish.** Wrong answer.
2 book	4 **a printed work consisted of pages.** Correct answer.

Input file: **words.txt**

```
18mohammadpopular arabian name
24booka printed work consisted of pages
35planewe use it to travel
47whispersoftly spoken
54cakesweet baked dessert
64bluecolor of the sky
75appleround fruit with a crisp texture
85waterliguid essential for life
95pizzaPopular Italian dish
```

Problem 3 Solve this problem inside the file problem3.c

Write a complete C program that computes the distance between two points and mid-points. In your main function, do the following: (i) Declare and open two files called Info.txt (input file), which contains five rows

and Results.txt (output file); (ii) Read, using any loop structure, the coordinates of pair of points $\boldsymbol{A}$ and $\boldsymbol{B}$ from Info.txt file. For example, the values 2.5 and 4.0 represent x1 and y1 coordinates respectively for the point A, and the values 6.0 and 7.5 represent x2 and y2 coordinates respectively for the point B. Once a program read a pair of points $\boldsymbol{A}$ and $\boldsymbol{B}$, it calculates the distance between them (as given in the first equation), and computes the mid-point between the pair points (as given in second and third equations); (iii) Then, store the computed distances (Distance) and midpoints (Mid$\boldsymbol{x}$, Mid$\boldsymbol{y}$) into a Results.txt file as shown in the figure below.

$$Distance_{AB} = \sqrt{(A_{x1} - B_{x2})^2 + (A_{y1} - B_y)^2}$$

$$Mid_x = \frac{(x1 + x2)}{2}$$

$$Mid_y = \frac{(y1 + y2)}{2}$$

Input file: **Info.txt**

```
2.5   4.0   6.0   7.5
1.0   3.0   5.5   6.0
4.3   2.6   6.0   9.5
8.0   12.4  13.6  9.1
6.0   8.0   9.0   4.5
```

Output file: **Results.txt**

```
Dist    MidX    MidY
4.95    4.25    5.75
5.41    3.25    4.50
7.11    5.15    6.05
6.50    10.80   10.75
4.61    7.50    6.25
```