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**DT282/1 Algorithms Assignment**

*“The Technological University of Dublin (TU Dublin) will be brought into being by the convergence of Dublin Institute of Technology (DIT), Institute of Technology Tallaght (ITT) and Institute of Technology Blanchardstown (ITB) who already share this vision for higher education and have an agreed strategy for its implementation.”*

Each institution has a BSc Computing.

* DIT has a BSc Computing
* ITT has a BSc Computing
* ITB has a BSc Computing

After the merger, there will only be one BSc Computing so all students will attend the BSc Computing in TU Dublin.

**For this project, we will look at first year only. There are *5* students in first year of each course.**

1. In pseudo-code, write an algorithm that combines and sorts the **three** lists of students into one list:
   1. You should attempt to adjust a sorting algorithm by adding a searching part to it or by using two sorting algorithms.
   2. What is its Big O? Illustrate in detail why.
2. Using a flowchart, write an algorithm to search for all students from DIT:
   1. What is its Big O? Illustrate in detail why.
3. Using a flowchart, write an algorithm to search for a specific student by surname:
   1. What is its Big O? Illustrate in detail why.
4. Implement the algorithms derived in 1, 2 and 3 in C. *You will need to input the three lists of students (with relevant information), each time you run the program.*

**Marking Breakdown**

|  |  |
| --- | --- |
| **Section** | **Mark** |
| Part 1 | 40% |
| Part 2 | 15% |
| Part 3 | 15% |
| Part 4 | 20% |
| Demo | 10% |

This assignment must be submitted before **7pm on Sunday 19th April**.

The project will be demonstrated on **Week 12** and **Week 13.**

What do I need to submit? (1 & 2 in a zip file)

1. A project report (in pdf) with Part I, Part II and Part III.
2. C file(s) from Part IV.
3. Quiz (through Webcourses, as shown below).

**QUESTION 1**

What algorithm(s) did you use in Part I?

### QUESTION 2

What is the Big O of Part I?

### QUESTION 3

What algorithm(s) did you use in Part II?

### QUESTION 4

What is the Big O of Part II?

### QUESTION 5

What algorithm(s) did you use in Part III?

### QUESTION 6

What is the Big O of Part III?

### QUESTION 7

 Please tick the elements that you submitted:

|  |
| --- |
|   Pseudo code for Part I |
|   Flow chart for Part II |
|   Flow chart for Part III |
|   Code working for Part I |
|   Code working for Part II |
|   Code working for Part III |