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| **LETTERKENNY INSTITUTE OF TECHNOLOGY**    **ASSIGNMENT COVER SHEET** |

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| Lecturer’s Name:  **Gary Cullen**  Assessment Title:  **Laboratory Work:**  Work to be submitted to:  Date for submission of work:  **3rd February 2015**    Place and time for submitting work:  **electronically before 12:00** |

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| **To be completed by the Student**    Student’s Name:  Class:  Subject/Module:  Word Count (where applicable):  I confirm that the work submitted has been produced solely through my own efforts.  Student’s signature: Date: |

**Notes**

**Penalties:** The total marks available for an assessment is reduced by 15% for work submitted up to one week late. The total marks available are reduced by 30% for work up to two weeks late. Assessment work received more than two weeks late will receive a mark of zero. [Incidents of alleged plagiarism and cheating are dealt with in accordance with the Institute’s Assessment Regulations.] **Late Hand-up‘s are not appropriate in the case of class tests.**

**Plagiarism:** Presenting the ideas etc. of someone else without proper acknowledgement (see section L1 paragraph

8).

**Cheating:** The use of unauthorised material in a test, exam etc., unauthorised access to test matter, unauthorised collusion, dishonest behaviour in respect of assessments, and deliberate plagiarism (see section L1 paragraph 8).

**Continuous Assessment:** For students repeating an examination, marks awarded for continuous assessment, shall normally be carried forward from the original examination to the repeat examination.

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| Title: | **Quadratic Sorting Algorithms** |
| Date: | 26th January 2015 |
| Time: | 13:30-15:30 |
| Room: | 2294 |
| Member: | Student’s Name |
| Description: | Overview of the subject with research into commonly used terms. |
|  | (1 or two sentences) |

Introduction:

In this practical the learner will write a menu based application which will:

1. Allow the user to select 1000, 10,000 or 100,000 elements for a random number based array.
2. Allow the user to select the structure of the data in the array (random, sorted, inversely sorted).
3. Allow the user to select a standard bubble sort, enhanced bubble sort, selection sort or insertion sort algorithm on the array chosen.

The time taken for the execution of each algorithm on each data structure as well as the comparisons and swaps will be recorded and the data will be compared and evaluated. The environment used to create this application will be eclipse ee.

Method:

A sorter class was created containing the following methods:

1. A doRandomArray method which created a random number between 0 and 100.
2. A doSortedArray method which sorted the random numbers in ascending order.
3. A doInverselySortedArray method which sorted the random numbers in descending order.
4. A basic doBubbleSort method which performed a bubble sort on the chosen array.
5. A modified doEnhancedBubbleSort method which performed a bubble sort more efficiently on the chosen array.
6. A doSelectionSort method which performed a selection sort on the chosen array.
7. A doInsertionSort methon which performed an insertion sort on the chosen array.

A sortTester class was then created which contained the following:

1. A keyboard input which enabled the user to select 1000, 10,000 or 10000 elements for the length of the array and random numbers were … in the array using the doRandomArray method.
2. A menu which enabled the user to select a random array (the original array), a sorted array or an inversely sorted array based on the random array created in step one above.
3. A menu which enabled the user to perform bubble sort, enhanced bubble sort, selection sort or insertion sort on the array chosen and print the results.

Code was also incorporated into the sort methods to record and print the amount of comparisons and swaps.

A stopwatch class was then created containing the following methods to enable the various sort operations to be timed which included start, stop and reset methods for milliseconds and nanoseconds and these methods were incorporated into the sort methods. The menu system then printed out these values when the sorts were performed.

Summary:

Surmise what was covered.

Results:

Did the lab work? What happened? Did the program run as expected?

Conclusions:

(Remember the conclusions are most important.) What did you learn? Can you see how this would apply in the “real world”?

Recommendations:

Can you recommend additional work that would enhance the lab or your knowledge of the area?

**Notes:**

1. Labs cannot be written up unless they were attended during the practical session.
2. Labs should be written in third party past tense.

‘The disk was inserted’ not ‘we put in the disk’.

1. Use times new roman or similar with 12point, single line spacing.
2. Illustrate where appropriate.
3. Indicated all steps carried out.
4. Conclusions must be provided for each lab.
5. Where you are working in groups you must indicated all group members with your name underlined in each lab.
6. The Cover sheet covers each lab and must be signed in order for the work to corrected.
7. Section L of the Quality Assurance Guidelines will be applied in cases of plagiarism or copying.