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|  | **SCHOOL OF ENGINEERING, TECHNOLOGY & DESIGN**  **ASSIGNMENT GUIDELINES** | |
| **TITLE OF MODULE**:  MCOMD3PST – Operating Systems | | **MODULE COMPONENT:**  **50% of Module** |
| **MODULE TEAM**: Dr Vijay Sahota, Danny Werb | | **ASSIGNMENT CONTACT**: Dr Vijay Sahota  [Vijay.Sahota@canterbury.ac.uk](mailto:Vijay.Sahota@canterbury.ac.uk) |
| **ASSIGNMENT DEADLINE**:  15 Jan 2021 14:00 | | **EXPECTED FEEDBACK DATE:**  5 Feb 2021  **Location of Feedback:** VIA TURNITIN ON BLACKBOARD |
| **ASSESSMENT TYPE** | | Report |
| **Where to Submit:** BLACKBOARD TURNITIN SUBMISSION TOOL  If you experience any problems with this system then please contact the Computing Administration Team ([computing@canterbury.ac.uk](mailto:computing@canterbury.ac.uk))  **What to Submit:**  **A 2000 word report of high professional standard.** | | |
| **TITLE OF ASSIGNMENT**: Simulation Assignment (RAID) + Essay | | |

**ASSIGNMENT INSTRUCTIONS**

This is an individual submission and must be your own work.

There are ***two parts*** to this task. You must complete ***all parts*** of thetask.

**TASK 1:**

Having completed your initial assignment (or extending the given sample), you are now to implement all the of the required simulators to complete your software, namely ‘Single HDD’, ‘RAID 0’, ‘RAID 1’, ‘RAID 01’ and ‘RAID 100’ simulated options.

All of these options will be adopting the simple HDD parameters passed to their respective bash place holders. For simplicity we will adopt these parameters as constants, in that, irrespective of the last read or write - seek & read/write times are the same.

Please refer to lecture slide for a complete breakdown for the operations of RAID.

In addition, after the simulator has completed - the total simulated execution will be printed on the screen and will also be saved to a default (a.out) file. If when prompted, a user enters an alternative file name, prior to the starting of the simulation, this will then be used.

*Note: Please refer to the sample simulation to assist understanding.*

*Note: All configuration files will be assumed to be correct (no validation required)*

*Note: you are free to extend your own solution, or use the simple sample solution provided; no additional marks will be given in either case.*

In addition to the coded solution you are required to provide a short informal write up (500 words) describing how **key aspects of code meet the requirements** for this task.

**Failure to provide a write up will result in ZERO marks.**

**Failure to provide an adequate write up will result in SCALING of code marks.**

[60 marks]

**TASK2: (***800 words Max***)**

* 1. Batch, interactive, hybrid, real time and embedded are types of operating systems. Give a brief outline of each type coupled with a named example along with an ideal use(r) case.

[15 marks]

* 1. The shortest seek time first and the SCAN/LOOK schemes are employed by storage devices (Hard disks) to minimise arm movement. Given a 40 track disk, with the following a requests: 15,4,40,11,35,7,14; Graphically illustrate how these schemes work coupled with a brief description highlighting any calculations . Additionally explain why you would chose SCAN/LOOK over shortest seek time first.

[25 marks]

**MARK SCHEME (RUBRIC)**

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| Task: | Mark |
| Correct calculation and writing of simulated results | 10 |
| Correct implementation of ‘Single HDD’ simulation | 2 |
| Correct implementation of ‘RAID 0’ simulation | 4 |
| Correct implementation of ‘RAID 1’ simulation | 4 |
| Correct implementation of ‘RAID 01’ simulation | 10 |
| Correct implementation of ‘RAID 100’ simulation | 14 |
| Suitable comments in code | 6 |
| 500 word write up | 10 |
| Task 2: Part A)  3 marks for each OS type (1= Description, 1= Name example, 1 = Use(r) case) | 15 |
| Task 2: Part B)  4 marks for each explanation  4 marks for each Graphically illustration & calculations  5 marks for justification(s)  4 marks supporting examples for justification | 25 |
| TOTAL | 100 |

Marks for the separate tasks are typified by grades indicated below.

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| General Programming Task 1  Such as (Correct implementation of ‘Single HDD’ simulation) | |
| **Percentage** | **Description** |
| 51-100 | Complete: Excellent, all aspects have been implementation works as requested and |
| 1-50 | Good: Fair attempt, most of the implantation has been implemented **or** code shows a plausible solution **or** Complete implementation but bugs exists/ has broken execution in certain cases. |
| 0 | No Attempt |

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| General Essay Task 2  Such as (Part B: 4 marks for each explanation) | |
| **Marks** | **Description** |
| 76-100 | Excellent: All aspects covered as outline/ complete explanation |
| 51-75 | Good: Most aspects/ explanation covered |
| 26-50 | Adequate: Some aspects/ explanation covered but core aspects/ explanation are missing |
| 1-25 | Less than adequate: Little or incorrect aspects/ explanation given |
| 0 | No Attempt |

**FORMATTING OF SUBMISSION:**

You to upload a zipped version of all your source code onto Bb (Turnitin), a bucket/ link will be provided in the same location where you downloaded this assignment.

You are to upload your written part onto Bb (Turnitin), a bucket/ link will be provided in the same location where you downloaded this assignment.

Any **screen shots, tables, figures, charts, illustrations, etc. will not contribute towards the word count**.

Your work must be adequately referenced throughout, using Harvard referencing style. Pears & Shields (2016) give a complete guide to Harvard referencing. Guidelines on using the Harvard Referencing style are available at:

<https://www.canterbury.ac.uk/library/docs/harvard.pdf>

<https://www.canterbury.ac.uk/students/docs/study-skills/resource-1-Harvard-Referencing-Guide.pdf>

The report must be submitted using the dedicated Blackboard grade centre submission bucket on or before the submission deadline.

**Deliverables:**

You are expected to produce a report of a high professional standard adhering to the guidelines given at:

P:\COURSEWORK\IT\\_Departmental Standards for Students

**LEARNING OUTCOMES ASSESSED (Fully or Partially):**

1. Evaluate critically different operating systems in terms of their technical characteristics, performance, reliability and related aspects;
2. Write effective scripts and/or relevant API calls to perform basic administrative tasks and/or construct simulations;
3. Demonstrate an understanding of process/threads: creation, process/thread management and scheduling and process/thread communication; file systems: the differing mechanisms for allocating storage space to files in terms of efficiency, performance and reliability; memory management and virtual memory, and the consequences of various paging and segmentation strategies;
4. Describe typical characteristics of I/O hardware and explain the purpose of various I/O programming techniques and explain the advantages of device independence;

**GRADUATE / EMPLOYABILITY SKILLS GAINED:**

This assessment is an opportunity to develop an understanding of the underlying operation so of bash script, here you will be implementing complex scripts that mimic operations that are often used in the management of operating systems.

All tasks build on skills required in industry, namely researching a problem (analysis), developing an idea (conception/ design) and documentation (though informal)

This assessment has been designed to exercise your abilities to work on your own and progress closer to becoming a proficient self-learner.

**PROGRAMMES OF STUDY:**

BSc (Hons) Business Information Systems

BSc (Hons) Computer Forensics & Security

BSc (Hons) Computing

BSc (Hons) Computer Science

BSc (Hons) Information Technology

BSc (Hons) Web Technology