SCHOOL OF SCIENCE AND TECHNOLOGY

COURSEWORK FOR THE BSC (HONS) COMPUTER SCIENCE; YEAR 2

ACADEMIC SESSION MARCH 2018; SEMESTER 6, 7, 8, 9

CSC2044: CONCURRENT PROGRAMMING **DEADLINE: 2 JULY 2018**

STUDENT NAME: _____

NRIC/PASSPORT NO: _____

INSTRUCTIONS TO CANDIDATES

- This assignment will contribute 20% to your final grade.
- This is an individual assignment.

IMPORTANT

The University requires students to adhere to submission deadlines for any form of assessment. Penalties are applied in relation to unauthorized late submission of work.

- Coursework submitted after the deadline but within 1 week will be accepted for a maximum mark of 40%.
- Work handed in following the extension of 1 week after the original deadline will be regarded as a non-submission and marked zero.
- Source code submitted will be checked with plagiarism detection software, and will be compared with the source code of other students. Students found to have cheated or plagiarized will be marked zero and will be referred for disciplinary action.

Lecturer's Remark (Use additional sheet if required)

I.....**Lishan Abbas**..... (Name) .....**15034614**.....std. ID received the assignment and read the comments..... (Signature/date)

Academic Honesty Acknowledgement

"I .....**Lishan Abbas**..... (student name). verify that this paper contains entirely my own work. I have not consulted with any outside person or materials other than what was specified (an interviewee, for example) in the assignment or the syllabus requirements. Further, I have not copied or inadvertently copied ideas, sentences, or paragraphs from another student. I realize the penalties *(refer to page 16, 5.5, Appendix 2, page 44 of the student handbook diploma and undergraduate programme)* for any kind of copying or collaboration on any assignment."

…..... (Student's signature / Date)

[This paper contains ONE questions printed on ONE page]

Question 1

a) Airport Traffic Control (Maximum 15 marks)

You are required to write a concurrent program to control the air traffic in an international airport. In this airport, there are **THREE (3)** runways that allow aircraft to land and depart. Following is a set of conditions that has to be fulfilled:

i) Aircraft that is going to land or depart has to be generated randomly.
ii) Departing aircraft is not allowed to take off in less than **5 seconds**, but it can take longer duration if there is no other aircraft that is going to take off.
iii) Landing aircraft will take **10 seconds** to land, and no aircraft is allowed to take off by using the same runway during this period of time.

Each aircraft is represented by a thread and assigned with a different ID. You have to print out a statement when an aircraft is created, departed, or landed, along with the time stamp. In addition to this, you are required to print out a statement when the aircraft takes the runway as well. Furthermore, appropriate action should be taken into consideration to **prevent deadlock** and **starvation**.

Count the number of times that each runway is used for departing/landing and include it as part of your output to ensure all runways are used fairly.

Your code will be marked on correctness, design, clarity, efficiency, and appropriate comments within the program.

b) Documentation File (5 marks)

Your documentation file must include:

i) Description of how you implemented your solution.
ii) Elements of the assignment that you were not able to complete.
iii) List and description of any bugs in your program.
iv) Description of how you tested your program, along with sample output from your program.

Marks will be generously deducted for poorly written descriptions, poor spelling, and poor grammar.

c) Submission

Marks will be generously deducted for not following submission instructions:

1. Submit a single zip file via elearn. The name of the zip file must be your full name and ID, separated by an underscore "_":
    a. JimmyJohnCarter_13431432
2. Your zip file must include all of your .java files and your documentation file. Please do not submit your entire project from Eclipse/Netbeans.
3. Your zip file must also include one additional Java file that includes all of your source code. Include your main class first, and then include all of your other classes. The name of your java file must be your full name and "all" separated by an underscore:
    a. JimmyJohnCarter_all.java

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