



**SECJ 1023 - Programming Technique II**

**Semester 201920201**

**Lecturer: Dr Muhammad 'Arif Mohamad**

**Assignment 1**

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Question 2 (page 93 – lab book)

A faculty in a private university wishes to computerise its student records system. The record of each student includes his or her name and the program he or she enrolls. The faculty offers several programs at postgraduate level such as “Master of Business Administration”, “PhD of Social Science”, and many more. Regardless of the program or degree, each student is appointed with a lecturer as his or her academic advisor. The role of the advisor is to guide the student on academic matters. As for the postgraduate programs either master or PhD degrees, they are conducted in fully research based. Each postgraduate student has to have a research project and a lecturer to supervise his or her project.

Based on the given problem, answer the following questions:

- Draw the UML class diagram for the above problem. Your design has to include the classes and their attributes and methods accordingly, as well as relationships between the classes. Each class has to provide a constructor, mutators, and assessors.
- Then, write the C++ code to implement the design. Your implementation should apply object-oriented programming concepts including data hiding, composition and/ or aggregation, association, and operator overloading
- Next, utilize the classes to store a list of postgraduate students. You need to use dynamic arrays for the list and fill it in with data read from an input file. Figure 6.10 shows the example of input file containing the list of postgraduate students. The first line in each file indicates the number of students the file contains. Following that is the record of a student in which each attribute is arranged in a line. The student records are separated by blank lines. Finally, print all the students from the arrays into another text file. Figure 6.11 shows an example of the output file.

50	}	<i>The number of students</i>
Bakar Bin Malik	}	<i>Student's name and program</i>
Master of Social Science	}	
Dr. Rohaya Qamarool	}	
Prof. Dr. Kamil Ahmad	}	
The Effects of Social Media	}	<i>Project supervisor</i>
	}	<i>Research project</i>
Ruby Gabriella		
PhD of Business		
Prof. Dr. Kamil Ahmad		
Prof. Dr. Saidi Abdullah		
Adaptive Human Capital Management		

*(due to limited spaces, the remaining student records are not shown in this figure)*

**Figure 6.10:** An example of input file named “pgstudents.txt”, for the list of postgraduate student records

Note that, the texts in *italic* are given to describe the fields accordingly. Also, only two records from the input file out of 50 are shown here due to limited spaces.

THE LIST OF POSTGRADUATE STUDENTS			
No	Name	Supervisor	Project
1	Bakar Bin Malik	Prof. Dr. Kamil Ahmad	The Effects of Social Media
2	Ruby Gabriella	Dr. Saidi Abdullah	An Adaptive Human Capital Management
..	.....	.....	.....
		<i>(students no 3 to 49 go here)</i>	
..	.....	.....	.....
50	Zul Bin Hashim	Prof. Dr. Kamil Ahmad	Artificial intelligence for robots

**Figure 6.11:** An example of the output file containing the lists of postgraduate students

Note that only some students are shown Figure 6.11 due to limited spaces.

#### Submission:

1. You are free to interpret the question based on your understanding. Submit the UML diagram in the forum.
2. Submission of full Source Code  
Make sure you have proper documentation and indentation in your program.