

Assignment 1

Deadline:	7 April 2022, 11pm
Evaluation:	40 marks (20% of your final grade)
Late Submission:	Deduct 5 marks per day late
Individual Work	You must complete this assignment by yourself (you must NOT share your code with others or use others' code)
Purpose:	Reinforce Java language basics, Arrays, classes, objects, and objects working together

1. System Description (Overview of Problem)

You are asked to write a program in Java to simulate a **University Paper Offering System**

The School of Mathematical and Computational Sciences (SMCS) provides several Information Science-related majors to undergraduate students. These majors are: Computer Science (CS), Information Technology (IT), Information Systems (IS), Software Engineering (SE), and Data Science (DS).

Each paper offered belongs to one or more majors and has a paper number (such as 159234) and a name. Each paper may include up to three assessment types (tests, assignments, exam), and each assessment type carries a particular weighting. Each paper is offered in all three of the following modes: internal Auckland, internal Palmerston North (PN), and distance. Each mode must be delivered by one lecturer.

Each lecturer is located at one of two campuses (Auckland or PN). A lecturer can only deliver an internal offering if it is located on his/her campus – but can deliver any distance offering. Each lecturer may deliver a minimum of zero offerings and a maximum of four offerings. Each lecturer's biographical details (first name, last name, ID number, and campus) must be recorded.

2. Tasks to complete:

- 1) Draw a class diagram, using UML to show your program design. You need to identify necessary classes, their attributes, and their methods – and then represent classes and their methods with possible associations in your class diagram (you can refer to the class diagram from Lecture 10 of Week 4 for expected details and components).

In your Java code, you should:

- 2) Add to your system test data regarding papers and lecturers (use the data provided on page 3 of this document).
- 3) Add yourself to the system as a lecturer. You MUST record your real name and your real Student ID number. You can choose either Auckland or PN as your campus.
- 4) Randomly assign lecturers to every paper offering based on the rules specified in the system description above.
- 5) When your program runs, it should display the following output in the same order as below, from Task 1 to Task 8:

Task 1: Full name of school

Task 2: All papers' details (including paper number, name, and majors it belongs to)

Task 3: All papers belong to your real major at Massey (such as 'CS')

Task 4: All papers that have an exam

Task 5: All papers whose assignments weigh more than 50% in total

Task 6: All paper offerings including paper number, offering mode, and lecturer

Task 7: The paper offerings that you teach

Task 8: The lecturer's name of Auckland offering 159234

3. Design and Implementation Guideline

Note: You will receive credit for correctness, completeness, no code duplication, clear on-screen output display. Also, the following **OOP and general software design concepts** will be checked while marking your program:

- 1) Class design and class diagram
 - a. Add class name
 - b. Add methods
 - c. Represent associations between classes
- 2) Class implementation
 - a. Data fields
 - b. Methods
 - c. Constructors
- 3) Encapsulation design and implementation – proper use of modifiers
 - a. Private
 - b. Protected
 - c. Public
- 4) Information storage and implementation
 - a. Use Array (or Java collection if you already know how) to store information
 - b. Must make use of getters and/or setters wherever appropriate

4. Other Specifications

You **must** follow the next five specifications when completing this assignment:

- 1) Create the method *displayInfo* as shown below to provide appropriate information. The content of *displayInfo* should be the first thing that displays on screen.

```
private static void displayInfo() {
    System.out.println("*****");
    System.out.println("Assignment 1, 159.234 Semester 1 2022");
    System.out.println("Submitted by: Mouse, Mickey 12345678");
    System.out.println("My Major at Massey: Computer Science");
    System.out.println("*****");
    System.out.println();
}
```

- 2) Place appropriate comments in your program – e.g.:


```
/** explain what the program file is doing . . . */
// explain what a part/method of the program is doing...
```
- 3) **DO NOT** hard-code any output for any task (any hard-coded output for tasks 1 – 8 will receive NO credit)
- 4) **DO NOT** add any package to the beginning of your .java file (for marking purpose)
- 5) **DO NOT** use any function to clean the screen at any stage of a program

5. Submission Requirements:

- 1) **Your class diagram** as a PDF file (you can use MS Visio or any other tool to draw your diagram)
- 2) **All your .java files (source codes)**
- 3) Zip all your files (class diagram and .java files) together and submit as a single file to Stream

6. You MUST use the following test data in your assignment:**1) Papers and their details:**

Number	Name	Belongs to the following major(s)	Assignments	Tests	Exam
158100	Information Technology Principles	IT, IS	70%	30%	
158120	Web-based IT Fundamentals	IT, IS	60%	40%	
159101	Applied Programming	IT, IS, CS, DS, SE	50%	50%	
159201	Algorithms and Data Structures	CS, DS, SE, IS	40%	20%	40%
159234	Object-Oriented Programming	CS, SE	50%	10%	40%
158337	Database Development	IT, SE, DS	60%		40%
158345	Professionalism in the Information Sciences	IT, IS, CS, DS, SE	100%		

2) Lecturers and their details

ID	First Name	Last Name	Campus
1105236	Amy	Sheffield	PN
1235894	Victoria	Jensen	PN
7225669	James	Lee	PN
1328991	Colin	Delmont	PN
1562347	Thomas	Becker	Auckland
5664789	Steven	Hobbs	Auckland
3658947	Andrew	Jackson	Auckland
6332698	Jonathon	Wood	Auckland
12345678	Mickey	Mouse	Auckland

3) Example output:

```

Run: SMCCSystem x
Assignment 1, 159.234 Semester 1 2022
Submitted by: Mickey Mouse, ID: 12345678
My Major at Massey: Computer Science
*****

----- Task 1 -----
School Full Name: School of Mathematical and Computational Sciences

----- Task 2 -----
All papers details:
158100 Information Technology Principles (IT IS )
158120 Web-based IT Fundamentals (IT IS )
159101 Applied Programming (IT IS CS DS SE )
159201 Algorithms and Data Structures (CS DS SE IS )
159234 Object-Oriented Programming (CS SE )
158337 Database Development (IT SE DS )
158345 Professionalism in the Information Sciences (IT IS CS DS SE )

----- Task 3 -----
Papers that belong to Major CS:
Paper - 159101 Applied Programming
Paper - 159201 Algorithms and Data Structures
Paper - 159234 Object-Oriented Programming
Paper - 158345 Professionalism in the Information Sciences
Total matching papers in specified Major - CS :4

----- Task 4 -----
Papers that have exam:
Paper - 159201 Algorithms and Data Structures
Paper - 159234 Object-Oriented Programming
Paper - 158337 Database Development
Total number of papers that have exam: 3

```

```
----- Task 5 -----
Papers that their assignments weigh higher than 50.0%:
Paper - 158100 Information Technology Principles
Paper - 158120 Web-based IT Fundamentals
Paper - 158337 Database Development
Paper - 158345 Professionalism in the Information Sciences
Total number of papers that have assignments weighted more than 50%: 4

----- Task 6 -----
Paper offering details:
158100 Distance Mickey Mouse
158100 Auckland Andrew Jackson
158100 PN Victoria Jensen
158120 Distance Victoria Jensen
158120 Auckland Mickey Mouse
158120 PN Victoria Jensen
159101 Distance Mickey Mouse
159101 Auckland Steven Hobbs
159101 PN Amy Sheffield
159201 Distance Andrew Jackson
159201 Auckland Thomas Becker
159201 PN Victoria Jensen
159234 Distance Andrew Jackson
159234 Auckland Andrew Jackson
159234 PN James Lee
158337 Distance Jonathon Wood
158337 Auckland Thomas Becker
158337 PN James Lee
158345 Distance James Lee
158345 Auckland Steven Hobbs
158345 PN Amy Sheffield

----- Task 7 -----
The paper offerings that I teach:
Paper Offering - 158100 Distance Lecturer: Mickey Mouse
Paper Offering - 158120 Auckland Lecturer: Mickey Mouse
Paper Offering - 159101 Distance Lecturer: Mickey Mouse
I am teaching 3 paper(s)

----- Task 8 -----
The lecturer of Auckland offering of 159234:
Lecturer's Name: Andrew Jackson
This lecturer is teaching 4 paper(s)

Process finished with exit code 0
```