HIGHER EDUCATION PROGRAMMES

Academic Year 2024:	July - December
Formative Assessment 2:	Systems Development 2A (HSYD201-1)
NQF Level, Credits:	6, 40
Weighting:	25%
Assessment Type:	Practical exercises
Educator:	O. Dyantyi
Examiner:	O. Dyantyi
Due Date:	25 October 2024
Total:	50 marks

Instructions:

- This formative assessment consists of THREE Questions.
- The assessment is based on units 3 – 4 (Chapters 12 – 13 of the Java Programming Textbook).
- You can use NetBeans IDE

Submission:

1. A pdf with a cover page with your details and answer for **Question 2**
2. A zip folder of your **Question 1** program. Compress/Zip your NetBeans project folder

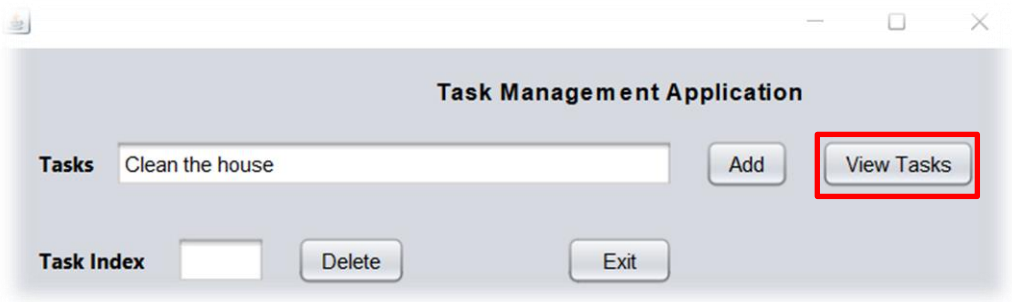
The assessment covers the following learning outcomes:

- Use recursion to solve mathematical problems
- Use the ArrayList class
- Use the JFrame class
- Use the JLabel class
- Extend the JFrame class
- Add JTextFields and JButtons to a JFrame

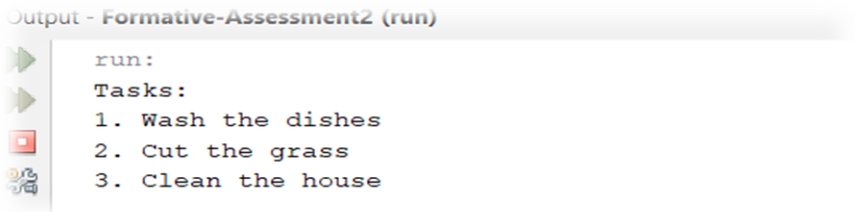
Question 1 [33 marks]

ArrayList is preferable when the application requires frequent random access to elements or relies heavily on index-based operations. In this question, you are required to create a program that handles a list of tasks for a project using an ArrayList. Each task is described by a string. Use Swing controls and event listeners to create a GUI that will insert/add tasks, view tasks in the console, and remove/delete tasks. (33 marks)

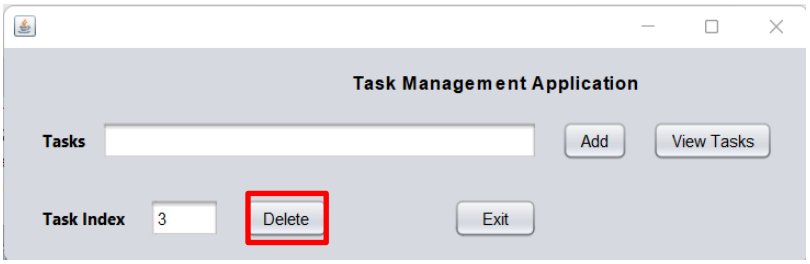
Example:

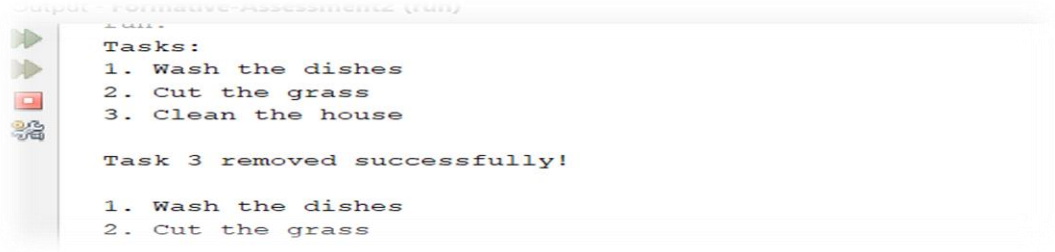


Console



Delete the task using the task index number:





Criteria	Function	Marks
GUI Design.	Layout: Is the GUI layout intuitive and visually appealing? (3 marks) Components: Are appropriate Swing components used for task insertion, viewing, and removal? (5 marks)	**8 marks**

Functionality.	Task Insertion: Does the program successfully insert/add tasks to the ArrayList when triggered by the GUI? (5 marks) Task Viewing: Does the program correctly display tasks in the console when triggered by the GUI? (5 marks) Task Removal: Does the program successfully remove/delete tasks from the ArrayList when triggered by the GUI? (5 marks)	**15 marks**
Event Handling.	Event Handling: Is event handling implemented correctly to perform the desired tasks (insertion, viewing, removal) based on user actions?	**10 marks**

Question 2 **[17 marks]**

Create a Java method called recursivePower. This method should calculate the power of a given base number raised to an exponent using recursion. The method must accept two integer parameters: base and exponent. Your implementation should handle both positive and negative exponents. In other words, it should compute the result of the base raised to the power of exponent recursively. (17 marks)