Islamic University of Technology

Visual Programming Lab

CSE 4402

Lab 3

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1 Task 1

Write a Java program to create an abstract class `Shape3D` with abstract methods `calculateVolume()` and `calculateSurfaceArea()`. Create subclasses `Sphere` and `Cube` that extend the `Shape3D` class and implement the respective methods to calculate the volume and surface area of each shape.

2 Task 2

Write a Java program to create two interfaces named: `Encoder` and `Decoder` with methods `encode()` and `decode()`. An abstract class should be implemented named `EnigmaMachine` which should implement both `Encoder` and `Decoder`. It should open up a `.txt` file being passed as an argument to encrypt along with the key. The encryption process shifts each character forward by the given key.