

## Exercise 1: Calculator

- **Constructors:**
  1. No-argument constructor → default mode = "Basic".
  2. Constructor with mode name.
- **Method Overloading:**
  - add(int a, int b)
  - add(double a, double b)
  - add(int a, int b, int c)
- **Normal Method:**
  - showMode() → print calculator mode.

## ♦ Exercise 2: Student

- **Constructors:**
  1. Accepts only id.
  2. Accepts id and name.
  3. Accepts id, name, and grade.
- **Method Overloading:**
  - updateGrade(char grade)
  - updateGrade(double marks) (converts marks to grade internally).
- **Normal Method:**
  - showDetails() → print student details.

## ♦ Exercise 3: BankAccount

- **Constructors:**
  1. Default constructor → balance = 0.
  2. Constructor with initial balance.

- **Method Overloading:**

- deposit(int amount)
- deposit(double amount)

- **Normal Methods:**

- withdraw(double amount)
- showBalance() → print balance.

◆ **Exercise 4: Library**

- **Constructors:**

1. Default constructor → "Empty Library".
2. Constructor with library name.

- **Method Overloading:**

- addBook(String title)
- addBook(String title, String author)
- addBook(String title, String author, int year)

- **Normal Methods:**

- showLibraryDetails() → print library name and books count.
- totalBooks() → return number of books.

◆ **Exercise 5: Shape**

- **Constructors:**

1. Default constructor → "Unknown Shape".
2. Constructor with shape name.

- **Method Overloading:**

- area(int side) → square.
- area(int length, int width) → rectangle.

- `area(double radius)` → circle.
- **Normal Method:**
  - `showShape()` → print shape type.