

## Green University of Bangladesh

**Department of Computer Science and Engineering (CSE) Faculty of Sciences and Engineering**

**Semester: (Spring, 2023), B.Sc. in CSE (Day)**

**LAB REPORT NO: 0**6

**Course Title: Object Oriented Programing Lab**

**Course Code: CSE 202 Section: DE**

**Student Details**

|  |  |
| --- | --- |
| **Name** | **ID** |
| Md. Moshiur Rahman | 221902324 |

Submission Date : 23**/**0**5**/2023

**Course Teacher’s Name** : **Dr. Muhammad Aminur Rahaman**

**[For Teachers use only: Don’t Write Anything inside this box]**

|  |
| --- |
| **Lab Report Status**  **Marks: ………………………………… Signature:..................... Comments:.............................................. Date:..............................** |

##### 1. TITLE OF THE LAB EXPERIMENT:

Make a "gpa\_calculator" user-defined package that will contain "GpaCalculator" class then import it into the main class with a different package to calculate GPA. Users will provide different marks and your system will calculate GPA based on the marks.

**2. OBJECTIVES**

* Encapsulation: Grouping all the classes and resources related to the GPA calculation functionality under the gpa\_calculator package.To gather knowledge of how interface works.
* Code Reusability: Once defined in a package, the classes and resources can be easily reused in other projects or parts of the codebase by importing the package.
* Modularity: Separating the GPA calculation logic into its own package allows for better modular design and code organization.

##### 3. ALGORITHM

Step-1 : Define the GpaCalculator class in the gpa\_calculator package.

Step-2 : . Implement the calculateGPA method that takes an array of integers (marks) as input and returns a double value representing the GPA.

Step-3 : Initialize a variable totalMarks to 0.

Step-4 : Iterate through each mark in the marks array. Add the mark to the totalMarks.

Step-5 : Calculate the average marks by dividing totalMarks by the length of the marks array and store it in the averageMarks variable.

Step-6 : Calculate the GPA by dividing averageMarks by 25.0 and store it in the gpa variable.

Step- 7: Return the gpa.

Step- 8: Define the Main class in a different package.

Step- 9 : Import the GpaCalculator class from the gpa\_calculator

package.

Step- 10 : Create a Scanner object to read user input.

Step- 11 : Prompt the user to enter the number of subjects.

Step- 12 : Read the input and store it in the numSubjects variable.

Step- 13 : Create an array marks of size numSubjects to store the marks.

Step- 14 : Use a loop to iterate numSubjects times.

Prompt the user to enter the marks for each subject.

Read the input and store it in the corresponding index of the marks array.

Step- 15 : Call the calculateGPA method from the GpaCalculator class, passing the marks array as an argument, and store the result in the gpa variable.

Step- 16 : Print the calculated GPA.

Step- 17 : Close the Scanner object.

**4. IMPLEMENTATION**

package gpa\_calculator;

public class GpaCalculator {

public static double calculateGPA(int[] marks) {

int totalMarks = 0;

for (int mark : marks) {

totalMarks += mark;

}

double averageMarks = (double) totalMarks / marks.length;

double gpa = averageMarks / 25.0;

return gpa;

}

}

import gpa\_calculator.GpaCalculator;

import java.util.Scanner;

public class Main {

public static void main(String[] args) {

Scanner scanner = new Scanner(System.in);

System.out.print("Enter the number of subjects: ");

int numSubjects = scanner.nextInt();

int[] marks = new int[numSubjects];

for (int i = 0; i < numSubjects; i++) {

System.out.print("Enter the marks for subject " + (i + 1) + ": ");

marks[i] = scanner.nextInt();

}

double gpa = GpaCalculator.calculateGPA(marks);

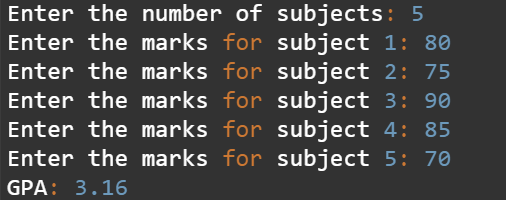
System.out.println("GPA: " + gpa);

scanner.close();

}

}

**5. TEST RESULT**



**6. ANALYSIS & DISCUSSION**

The code snippets provided are missing the package declarations. Each file should start with a package statement that matches the package name. For example, in the Main class, it should start with package gpa\_calculator.

It's essential to ensure that both the GpaCalculator and Main classes are located in the correct directory structure that matches the package structure. The GpaCalculator class should be saved in the gpa\_calculator package directory, and the Main class should be saved outside the gpa\_calculator package in a different directory.

Make sure that the class files have the appropriate file extensions (.java) and are compiled before running the program..