

**American International University- Bangladesh**

**CSC 1205: Object Oriented Programming 1 (JAVA)**

**CO4 Evaluation**

**Project Concluding Report**

**Spring 19-20**

**Group ID: None**

**Project Title: General Calculator Project using Java**

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**Introduction:**

*Java is a widely known programming language around the world. It is a general purpose, class based, object-oriented computer programming language that is specifically designed to have as few implementation dependencies as possible. It is intend to let developers “write once, run anywhere” (WORA). Nowadays calculation that we use are so advanced and everything is available on computer. But for project purpose I am doing this “General Calculator” project. It will increase my programming capability using Java and betterment for my future to continue with Java programming language.*

**Problem Analysis:**

*In this analysis I am going to give broad project analysis in this part. Firstly, a calculator is a device which is used for performing various types of numerical calculations. The major goal of this project is able to use functions like addition, subtraction, multiplication, division, power and modulus. Anyone can use this project to calculate using two variables with operations* ***+,-,\*,/,^*** *and* ***%****. This project is one kind of a general calculator so any student, teacher or rookie programmers can use it easily using windows command prompt.*

**UI Design Analysis:**

*To interact with the application or the project first user have to locate the Calculator.java file then they have to run it with* ***windows command prompt****. Giving command* ***javac Calculator.java*** *the compiler will check for errors. If the compiler do not find any error the compiler will not reply anything and will create a* ***Calculator.class*** *file. Then the user have to run the calculator application using* ***java Calculator*** *command****.*** *The program will start and firstly user have to choose one operation each time. There are six types of operation in this general calculator application project. After choosing the operation user have to give first number then the application will want second number or the base/power of first number instead. Then the application will calculate the user’s given problem as solution. There will be seventh operation that is called* ***End Application.*** *This operation will be used to end**thi****s Calculator*** *application****.*** *Each time the user run the* ***Calculator*** *application and calculate anything in the application there will be a saved log of operations which user have done recently and the log will visible on* ***windows command prompt*** *when user chooses* ***End Application*** *operation.*

**Logical Analysis:**

*There are six types of logical operation applied in this application. They are addition, subtraction, multiplication, division, power and modulus. These logical operations are used to build this full* ***Calculator*** *application. Without the these logical operation the* ***Calculator*** *application is not possible to build. The logical operations are used under the* ***public class Calculator.*** *There will be two variables to work with each logical operations. Each logical operations have it’s own logical equation. In this application the logical operation are also used after* ***public static void main(String[] args)*** *in java (****I/O steam****) switch statement as six types of case or logical operation. The applied logics used is this application is running properly as expected.*

**OOP Concept Analysis:**

*OOP1 principles are used in this* ***Calculator*** *project. The OOP concepts like* ***encapsulation, class creation, object creation, exception handling and I/O stream*** *are used in this project application.* ***Encapsulation*** *in java is a mechanism of wrapping the* ***variables*** *and code acting on the* ***methods*** *together as a single unit. In* ***encapsulation****, the* ***variables*** *of a* ***class*** *will be hidden from other* ***classes****, and can be accessed only through the* ***methods*** *of their current* ***class****.* ***Encapsulation*** *is applied as public in this application so that anyone can access or view this application and* ***encapsulation******methods*** *are applied after* ***public static void main(String[] args)****.* ***Class creation*** *is a user defined blueprint or prototype from which* ***objects*** *are created.  It represents the set of* ***methods*** *that are common to all objects of one type. As* ***class creation public class Calculator*** *is created at first to apply logical operations in this application project.* ***Object creation*** *a basic unit of Object Oriented Programming and represents the real life entities.  A typical java program creates many objects, interact by invoking* ***methods****.* ***Object creation*** *is done after* ***public static void main(String[] args)*** *and the object created in this application project is called* ***calculator1.******I/O stream*** *OOP concept is also used to deal with this calculator project application. In general, a stream means continuous flow of data.* ***I/O stream*** *is used to take input and give output without having every part of the code understand in the physical. Java encapsulates stream under the* ***java.io package****. The* ***try, catch*** *is simplest method of* ***exception handling*** *that is used in this calculator project program. If anyone wants to run code using* ***try*** *block, and any exception that the code* ***throws*** *can caught by one or more time using* ***catch*** *block. This method will* ***catch*** *any type of exception that get thrown.* ***Exception handling*** *is the easiest way do any kind of java project.*

**Impact of this Project:**

*Using this* ***Calculator*** *application project anyone can access this application and use it do general calculator operations at ease. In society this application project will help other new java programming language developers to develop their skills in programming. They can also implement many other operations in this* ***Calculator*** *application project in future. Java is a programming language that anyone write once can run anywhere and anyone can modify this application project for future improvements. Teachers, students and new rookie programmers can be benefitted from this application project.*

**Limitations and Possible Future Improvements:**

*This application is only a general calculator project. In future there will be more improvements made in this application. Such as scientific operations will be implemented in this general calculator project. This application will be improved more to work fast and responsive. This application project will be free for all and source code will be uploaded on GitHub for development purpose for all other developers. Scientific calculator project will be future improvement of this general calculator project.*