Java (based on the java day one contents covered)

Create a calculator with mutating state: it should evaluate

1) Arithmetic operation 2) Scientific operation 3) Trigonometric operation with individual operations separately or combined with binary operation or multiple operation at a stretch (which is mutation state). A console input has to be taken until return key is pressed. Once the return key is pressed the equation has to be evaluated with error handling.

Evaluate the equation from left to right (no priority to be taken at this stage)

Create user define exception for Equation\_In\_Complete, Zero\_division, Invalid\_Operator, Invalid\_value;

Create abstraction/interface first and the implement run time polymorphism using factory design pattern.

Use Enum, arrays, string functionalities.

Solution:

Mutation State is where the state or structure is keep on changing the state does not remain the same. Example: the evaluation may be between integers, between integer and other data type, between arithmetic and scientific operation or any other operation. Example "10 + sqrt(4) + sin(90)".

Follow the below steps and the actual code is given in src folder (attached).

Step 1: open java IDE and create a java project.

Step 2: create the package p1, p1.exceptions, p1.runtime poly

Step 3: create user defined exceptions (inherits Exception super class and create zero and one argument constructor) 1) Equation\_In\_Complete (to handle the error if the expression ends with operator), 2) Invalid\_operatro (to handle the error if unknown operators are used) and 3) Invalid\_value (if arithmetic operands contain non-digit value.

Step 3.0: create Enum ScintificOp which has constant abs, sqrt

Create Enum TrignometircOp which has constants sin, tan, cos, sec.

Step 4: create Abstract class Airthmetic as show in code.

Step 5: create the class Add, Sub, Mul, Div and Percent which over rides the method of Airtmetic abstract class.

Step 6: create Expression\_evaluator Class to evaluate Airthmetic, trigonometric and scientific operation (as shown in code) it should evaluate the expression of kind "10 + sqrt(4) + sin(90)". ( of any combination and any length from left to right).

Step 7: create main class to evaluate the expression given.