

# LAB 4: EXCEPTIONS

Implement a Java program to calculate the Mathematical expressions

- $x + y$
- $x - y$
- $x * y$
- $x / y$
- $x \% y$

## Notes:

- All the arithmetic expressions should consist of exactly two operands and one operator.
- The two operands x and y are integers.
- You can assume that there is at least one blank before the operator and at least one blank after the operator. (Use the **Scanner** *nextInt()* method to read the operands and the **Scanner** *next()* method to read the operator).
- Echo the arithmetic expression that is calculated when giving the result. For instance, if the user enters "3 + 4" then your calculator program should output  
 $3 + 4 = 7$
- Note that the user input could be erroneous (in which case the expression cannot be computed). In the case of errors, give the error messages to the user, for example:
  - the operand is not an integer
  - illegal operator
  - / by zero

## IMPLEMENTATION DETAILS

- Use try catch blocks to handle the exceptions.
- Use **one** switch statement. Do **not** use any 'if statements'.
- Use as many methods as you want.
- Keep calculating expressions until the user indicates that s/he wants to quit. The user enters a single 'q' instead an operator e.g. 4 q 5 means quit the program

## Exceptions:

- ✓ The `nextInt()` Scanner method generates `InputMismatchException` if the input is not an integer number.
- ✓ If you divide a number by 0, the `/` and `%` operations throw `ArithmeticException`.
- ✓ In your program, throw `IllegalArgumentException` if the operator is none of `(+, -, *, /, or %)`.

### Marking Scheme:

- [10 marks] Complete Program