Homework #1 Postfix Expressions

- Write a program to read an postfix expression from the keyboard, evaluate its value, and print the result.
- For simplicity you can assume that:

1. The postfix expression is valid.
2. Only binary operators are used: + (addition), - (subtraction), * (multiplication), / (division), % (modulus) and ^ (exponentiation).
3. The operands are integers, separated by whitespace.

- Test your program with at least 10 different input expressions before submitting your solution.

HW #1 (2)

- Sample run: This is a typical example of how your program should work (in interactive mode):

Enter the postfix expression: 7 8 3 * - 6 2 ^ + 3 – 7 2 / +

The value of the expression is: 19

- The program should then ask the user if another expression should be performed. Accept either "y" or "Y" as positive responses.

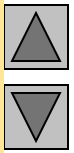
HW #1 (3)

- Your task is to:
  1. Implement the program using C++. **[或是像 C 的 C++]**
  2. Download Java J2SE from
     http://java.sun.com/j2se/
     and rewrite the program in Java.

- You are required to submit a single "**makefile**" as well.

```
1  // Fig. 15.1: fig15_01.cpp
2  // Addition program
3  #include <iostream>
4
5  int main()
6  {
7     int integer1, integer2, sum;           // declaration
8
9     std::cout << "Enter first integer\n";  // prompt
10    std::cin >> integer1;                  // read an integer
11    std::cout << "Enter second integer\n"; // prompt
12    std::cin >> integer2;                  // read an integer
13    sum = integer1 + integer2;             // assignment of sum
14    std::cout << "Sum is " << sum << std::endl; // print sum
15
16    return 0;   // indicate that program ended successfully
17 }
```

```
Enter first integer
45
Enter second integer
72
Sum is 117
```



Outline

1. Load <iostream>

2. main

2.1 Initialize variables integer1, integer2, and sum

2.2 Print "Enter first integer"

2.2.1 Get input

2.3 Print "Enter second integer"

2.3.1 Get input

2.4 Add variables and put result into sum

2.5 Print "Sum is"

2.5.1 Output sum

2.6 exit (return 0)

Program Output

- The following is designed to familiarize you with the mechanics of creating, editing, compiling, and running a text-mode Java application.
- You do not have to hand it in, but you should write and run it.
- The source code in the following pages simply prompts for and accepts two numbers from the user, adds them, and displays the result.
- The file name, *Add.java* is case-sensitive and must match the class name in the program.

```
/*************************************************************
    Program to add two numbers... note that input is accepted as a
     String and then an attempt is made to convert it to a integer for
     calculations. Non-numeric input is detected by the Exception
     mechanism and a default value is assigned to the value.
     *************************************************************/
import java.io.*;
import java.util.Scanner;

public class Add {
    public static void main(String args[]) {
        String amtStr;
        int num1 = 0, num2 = 0, tot = 0;
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the first number: ");
        amtStr = sc.next();
        // try to convert amt String to integer for calculation
        try {  num1 = new Integer(amtStr).intValue();  }
        catch (NumberFormatException  e) {
            System.out.println("Bad numeric input; 1st num set to 100");
            num1 = 100; }
```

```
        System.out.println("Enter the second number: ");
        amtStr = sc.next();

        try {  num2 = new Integer(amtStr).intValue();  }
        catch (NumberFormatException  e) {
           System.out.println("Bad numeric input; 2nd num is set to 50");
           num2 = 50; }

        tot = num1 + num2;

        System.out.println("Sum is: " + tot);

    } // end main
}   // end of class Add
```