Practice 8

1. Translate each of the following infix expressions into postfix and evaluate it

   a) (A+B)*(C+D)-E

   b) A-(B+C)*D+E/F

   c) ((A+B)/(C-D)+E)*F-G

   d) A+B*(C+D)-E/F*G+H

2. Evaluate the following postfix expressions:

   a) 8 2 + 3*16 4 / - =

   b) 12 25 5 1 / / * 8 7 + - =

   c) 70 14 4 5 15 3 / * - - / 6 + =

   d) 3 5 6 * + 13 – 18 2 / + =

3. Using the STL Stack library methods, write a program to push four strings of text ("first", "second", "third" "fourth") on the stack.

   After displaying the size of the stack, it uses a while loop to pop all the elements off the stack. The size of the stack should now be zero

```
#include <stack>  //must
#include <iostream>
using namespace std;//
int main()
{…
    stack<string> myStack;
    //push 4 strings
….
//pop all of them out using while loop
//confirm that stack is empty
```

4. A palindrome is a word which is spelled the same when reversed. Works like "civic", "rotor" are examples. Some are longer strings with embedded spaces and changing cases, like "Malayalam", "Madam Im Adam".

   You have probably seen by now that the FILO protocol can be used as a reversing mechanism. Write a function that uses a stack structure to reverse a string and use that to test if a simple string like "rotor" is a palindrome.

   For further refinement, improve the function further so that it is able to test strings like "Malay Alam", "Madam Im Adam".

5. In your digital electronics course last year, you learnt about converting from a decimal base to binary, octal etc. In this exercise, you will write a function to convert a decimal number into binary. The easiest approach is "repeated division by 2". In this approach, you keep dividing the number by 2, keeping track of the resulting quotient and the remainders from the division in each stage. The final answer is the last quotient digit, followed by the remainder digits from the latest divisions.

   That you are retrieving the latest remainders first and them proceeding to the last reminds one of a last-in-first-out behaviour. Implement this function dec2bin with the appropriate parameters and test it. Use STL's stack class as your stack structure.

   Once that is working, modify the function to allow the user to
   (or its definition) to help me write the algorithm in C++ codes?