CENG218 Labwork 4

Using the Stack code presented in the lecture;

1. Design a C++ program which reads an integer and converts it into binary form using a stack.
2. Design a C++ program which reads a binary expression and converts it into decimal form using a stack.
3. Design a C++ program which reads a string of parantheses from the user and checks if the parantheses are balanced or not using a stack.

   ```
   Enter your string: (()(()(())))
   The string is balanced.

   Enter your string: ((()))())()
   The string is not balanced.
   ```

4. Imagine you are in a dark corridor. A light switch is a certains steps ahead of you but you can not see where it is. With each certain number of steps, a voice guides you if the switch is still ahead of you or you have missed it. You are only allowed to take steps ahead or backtrack exactly the same number of steps you have previously taken until you are next to the switch.

   Design a C++ program which simulates this game using a stack. Start the program with randomly picking a number between 20 and 70. If the user enters "forwards N", where N is an integer, they take N steps forward. If the user enters "backwards", the user reverts back the last steps they have taken. With each operation, display a message on screen if the light switch is ahead or not. Repeat this procedure until the light switch has been reached.

   Note: the debug parantheses below are added for understanding how the player moves; they are not part of the actual output.

   ```
   You find yourself in a dark corridor. You can not see anything.
   Suddenly you hear a voice telling you to move forwards and find
   a light switch in order to find the exit...
   > forwards 7
   The voice tells the light switch is still ahead... (debug: 7/33)
   > forwards 12
   The voice tells the light switch is still ahead... (debug: 19/33)
   > forwards 20
   The voice tells you have missed the light switch and go backwards... (debug: 39/33)
   > backwards
   The voice tells the light switch is still ahead... (debug: 19/33)
   > forwards 10
   The voice tells the light switch is still ahead... (debug: 29/33)
   > forwards 5
   The voice tells you have missed the light switch and go backwards... (debug: 34/33)
   > backwards
   The voice tells the light switch is still ahead... (debug: 29/33)
   > forwards 4
   You found the light switch! Congratulations!
   ```