Introduction to Programming - Lab Exercises for Week 05

In each of the next three questions use a for loop:

1. Write a program which calculates the average of five numbers, read from the keyboard. Test your program with the following lists.

   3, 4, 5, 6, 7
   1.0, -2.5, 1.0, -1.5, 1.0

2. Write a program to display the sequence 5 10 15 20 25 30 35 40

3. Write a program to read an integer value from the keyboard and print the next 10 integers and their squares.

In the next two questions use a while loop:

4. Write a program which calculates the average of a list of numbers entered at the keyboard. The end of the list is indicated when 0 is entered (do not include the 0 in the average). Test your program with the following lists.

   3, 4, 5, 0
   1.0, -2.5, 1.0, -1.5, 1.0, 0
   0

5. Add the following line inside the body of the while loop just before the next number is read (replace `total`, `number` and `count` with whatever names you have used for your variables):

   ```
   TextIO.putln("total=" + total +
           ", number=" + number + ", count=" + count);
   ```

   The output from this line can help you trace the execution of the program. Test with each of the lists above again, and answer the following:

   a. How many times was the loop executed?
   b. What happened to the value of count?
   c. What happened to the value of number?
   d. What happened to the value of total?

In the following questions use do-while loops:

6. Write another version of the above program that calculates the average of a list of numbers using a do-while loop rather than a while loop. Which version do you prefer and why?

7. Adapt question 3 in the lab exercises for week 4 so that the user is given a maximum of three attempts to enter the correct user name and password.

8. Include the code below in a loop which keeps prompting the user for an option until they choose 4 to quit.

```
TextIO.putln("Your Menu.");
TextIO.putln("1: option 1 happens if you choose this!");
TextIO.putln("2: option 2 happens if you choose this!");
TextIO.putln("3: option 3 happens if you choose this!");
TextIO.putln("4: Exit.");
TextIO.put("Enter your choice (1..4): ");
int choice = TextIO.getlnInt();
switch (choice) {
      case 1 : TextIO.putln("Option 1 chosen"); break;
      case 2 : TextIO.putln("Option 2 chosen"); break;
      case 3 : TextIO.putln("Option 3 chosen"); break;
      case 4 : TextIO.putln("Quit option chosen"); break;
      default: TextIO.putln("Invalid choice. "
                            + "Please try again");
}
```