CSY2006 Week 2

Lab Exercises:

1. Write a program that can be used a math tutor for a young student. The program should display two random numbers to be added, such as:
   247
   +129
   The program should then pause while the student works on the problem. When the student is ready to check the answer, he or she can press a key and the program will display the correct solution:
   247
   +129
   = 376
   [Hint: MIN + rand() % MAX will generate a random number between MIN and MAX]

2. Extend the above program with following:
   If the answer is correct, a message of congratulations should be printed. If the answer is incorrect, a message should be printed showing the correct message.

3. Modify the above program again so it displays a menu allowing the user to select an addition, subtraction, multiplication, or division problem. The final selection on the menu should let the user quit the program. After the user has finished the math problem, the program should display the menu again. The process is repeated until the user chooses to quit the program.
   Input Validation: If the user selects an item not on the menu, display an error message and display the menu again.

4. Write a program that generates a random number and asks the user to guess what the number is. If the user's guess is higher than the random number, the program should display "Too high, try again." If the user's guess is lower than the random number, the program should display "Too low, try again." The program should use a loop that repeats the user correctly guesses the random number. The program should keep a count of the number of the guesses that the user makes.

When the user correctly guesses the random number, the program should display the number of guesses.

5. Write a program that reads ten integer numbers and outputs the number of inputs which are greater than 50, less than 50 or equal to 50. The program should also display the average of all numbers greater than 50 and the average of all numbers less than 50.

6. Write a program that asks the user for a positive nonzero integer value. The program should use a loop to get the sum of all the integers from 1 up to the number entered. For example, if the user enters 50, the loop will find the sum of 1+2+3+4+….+50.

7. Write a program that lets the user enter a series of integers. The user should enter -99 to signal the end of the series. After all the numbers have been entered, the program should display the largest and smallest.

8. Write a program that prints all the prime numbers between 2 and 200. A prime number (or a prime) is a natural number greater than 1 that has no positive divisors other than 1 and itself.

9. Write a program that asks the user to enter a positive integer no greater than 15. The program should then display a screen using the characters 'X'.

   For example, if input is 5:

   XXXXX
   XXXXX
   XXXXX
   XXXXX
   XXXXX

10. Using a nested for loop create the following triangle structure.

    1
    2 3
    4 5 6
    7 8 9 10
    11 12 13 14 15