Lab 7 - Lists

1. **Lottery Number Generator:** Design a program that generates a seven-digit lottery number. The program should generate seven random numbers, each in the range of 0 through 9, and assign each number to a list element. (Random numbers were discussed in Chapter 5.) Then write another loop that displays the contents of the list.

2. **Number Analysis Program:** Design a program that asks the user to enter a series of 20 numbers. Te program should store the numbers in a list then display the following data:
    - The lowest number in the list
    - The highest number in the list
    - The total of the numbers in the list
    - The average of the numbers in the list

3. **Driver's License Exam (optional):** The local driver's license office has asked you to create an application that grades the writ- ten portion of the driver's license exam. The exam has 20 multiple-choice questions. Here are the correct answers:

    1. A 2. C 3. A 4. A 5. D

    6. B 7. C 8. A 9. C 10. B

    11. A 12. D 13. C 14. A 15. D

    16. C 17. B 18. B 19. D 20. A

Your student's answers for each of the 20 questions from a text file and store the answers in another list. (Use provided text file, ask for help for reading from text file) After the student's answers have been read from the file, the program should display a message indicating whether the student passed or failed the exam. (A student must correctly answer 15 of the 20 questions to pass the exam.) It should then display the total number of correctly answered questions, the total number of incorrectly answered questions, and a list showing the question numbers of the incorrectly answered questions.

4. **Lo Shu Magic Square (optional):** The Lo She Magic Square is a grid with 3 rows and 3 columns (in picture 1 below). The Lo She Magic Square has the following properties:
    - The grid contains the numbers 1 through 9 exactly.
    - The sum of each row, each column, and each diagonal all add up to the same number. (shown in picture 2 below)

In a program you can simulate a magic square using a 2D List. Write a function that accepts a 2D List as an argument and determines whether the list is a Lo She Magic Square. Test the function in a program.

Picture 1:

4	9	2
3	5	7
8	1	6

Picture 2: