**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Session: \_\_\_\_\_\_**

**Programming I**

**Lab Exercise 12/2/2024**

**Words Challenge**

In the Words Challenge folder, you will find a file; words.txt which is used in MIT’s introductory programming course. It contains 55,900 words all on a single line separated by a single space character. Your task is to count the short words, medium length words and long words. Short is defined as fewer than 4 characters. Medium length words are words of length 4 to 7 characters inclusive. Long words are 8 or more characters. You are to write a program to do this. You program should report the number in each category.

**Palindrome Project**

In the Palindrome Project folder you will find a text file (words.txt) that contains many words (one word per line). Write a program to answer the following questions:

1. How many words are there? \_\_\_\_\_\_\_\_\_\_\_\_\_
2. How many palindromes are there? \_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. How many characters does the longest palindrome contain? \_\_\_\_\_\_\_\_\_\_\_\_\_
4. List the longest palindromes?
   1. \_\_\_\_\_\_\_\_\_\_\_\_
   2. \_\_\_\_\_\_\_\_\_\_\_\_
   3. \_\_\_\_\_\_\_\_\_\_\_\_
   4. \_\_\_\_\_\_\_\_\_\_\_\_
   5. \_\_\_\_\_\_\_\_\_\_\_\_
   6. \_\_\_\_\_\_\_\_\_\_\_\_
   7. \_\_\_\_\_\_\_\_\_\_\_\_
   8. \_\_\_\_\_\_\_\_\_\_\_\_
   9. \_\_\_\_\_\_\_\_\_\_\_\_
   10. \_\_\_\_\_\_\_\_\_\_\_\_

**Building a Random Number Generator**

Create a RandomGenerator application that implements the Linear Congruential Method. The formula used by this method is:



Use constant integers for a, c, and m. Choose a seed integer value for X0. Show 10 numbers from the sequence. Application output should look similar to:

Seed = 12, a = 1246. C = 200, m = 50

(1246 \* 12 + 200) % 50 = 2

(1246 \* 2 + 200) % 50 = 42

(1246 \* 42 + 200) % 50 = 32

(1246 \* 32 + 200) % 50 = 22

(1246 \* 22 + 200) % 50 = 12

(1246 \* 12 + 200) % 50 = 2

(1246 \* 2 + 200) % 50 = 42

(1246 \* 42 + 200) % 50 = 32

(1246 \* 32 + 200) % 50 = 22

(1246 \* 22 + 200) % 50 = 12