CMPS 148 Homework #2

Write a program that tests the "randomness" of the C++ random number generator.

Your program should generate 10,000 random numbers between 0 and 99. It would keep track of how many times each number was generated.

Have the program report the following information:

- Median number of times each number was generated
- Maximum times a number was generated (and which numbers they were)
- Minimum times a number was generated (and which numbers they were)

**Example:**

For clarity, I will restrict the values to be between 0 and 4, and I will only generate 10 for the example.

Let's say the random numbers generated were: 0, 3, 4, 2, 1, 1, 2, 1, 4, 2

- That means:
  - 0 appeared once
  - 1 appeared 3 times
  - 2 appeared 3 times
  - 3 appeared once
  - and 4 appeared twice.
- Then the median number of times each number appears is found by sorting the occurrences, and then taking the middle value (1, 1, 2, 3, 3) = 2
- The maximum number of times a number appeared is 3 – and 1 and 2 appeared three times.
- The minimum number of times a number appeared is 1 – and 0 and 3 appeared only once.

A typical run might look something like this, where 2 different numbers ended up appearing 80 times, and 84 appeared 132 times.

```
Expected number of times: 100
Minimum occurrences (80) times: 33, 61,
Maximum occurrences (132) times: 84,
Median occurrences: 99
```

You should expect to get different numbers each time you run the program, but the median occurrences should be right around 100.

*Note – you’ll need to use the srand and rand functions (look them up in the text book) to generate your random number appropriately.*