CPSC 6810: Mod 4
Data Structures and Algorithms
Graded Exercise 1: My Lucky Number
10 points

Everyone needs a lucky number. I'm a bit gullible and I'd like my lucky number to be the most frequently occurring number in the range 1 .. 100 that is produced by the C++ random number generator using a uniform distribution. I wrote a short program that generates 1000 such numbers and then captured the output in a file named `numbers.txt`

Your overall task is to create a class that keeps track of the frequency of occurrence of these numbers and a driver program that reads in the `numbers.txt` file and calls the methods from the **NumberCounter** class.

Create a C++ class, **NumberCounte**r, to count the occurrences. The class should use an array for storage. I used built-in (C-style) arrays rather than the <array> template.

The methods that the class should have are:

- A unique constructor takes two arguments: the minimum and maximum number that can occur. Should dynamically create and initialize an array of the correct size.
- void **addElement**(unsigned int number): increments the count of number
- bool **removeElement**(unsigned int number): decrements the count of number and returns true if successful or false if the number was not present or the count for the number is zero
- void **display**(): draws the results as a histogram
- unsigned int **getLuckyNumber**(): returns the most frequently occurring number
- Also create a main function in NumberDriver.cpp that properly exercises your class by creating an instance of NumberCounter and invoking the appropriate methods.

See the associated `numbers.txt` file, sample output and example Makefile.

Note that in C++, an array can be dynamically allocated using the new command. For example:

```
int *numbers = newint[max-min+1];
```

Bonus (+1): Create a UML class diagram for the NumberCounter class.