exercises for class III.1

I. using random numbers

- Write a program in which you declare one integer variable.
- Initialize the random number generator using the following line of code:
  ```
srand( time( NULL ));
  ```
- Then set the value of your variable to a random number by calling the `rand()` function.
- Output the value of your variable.
- Don’t forget that you will probably need to add the following lines of code to the top of your program:
  ```
  #include <iostream>
  using namespace std;
  #include <time.h>
  #include <stdlib.h>
  ```
- Compile and run your program to make sure it works.
- After your program works, try running it several times. You should see different values output each time you run the program.

II. scaling random numbers

- Modify the program you just created as follows:
  after setting the value of your variable to a random number, scale the value of your variable to a number between 0 and 20
- Hint: use the modulo (%) operator
- Reminder: the expression:
  ```
  \( x \% y \)
  ```
  is equal to the remainder after \( x \) is divided by \( y \)
  For example:
  ```
  10 \% 3
  ```
  is equal to 1
  and
  ```
  10 \% 5
  ```
  is equal to 0
- Compile and run your program to make sure it works.

III. using for loops

- Create a new program in which you declare one integer variable.
- Use that variable as a loop counter for a `for` loop that counts from 0 to 5.
- Inside the body of the loop, display the value of the loop counter each iteration, on a line by itself.
- Compile and run your program to make sure it works.
- Hint: the output of your program should look something like this:
  ```
  loop counter value = 0
  loop counter value = 1
  loop counter value = 2
  loop counter value = 3
  loop counter value = 4
  ```
IV. more for loops

– Modify the program above so that the output looks like this:

  loop counter value = 1
  loop counter value = 2
  loop counter value = 3
  loop counter value = 4
  loop counter value = 5

– Compile and run your program to make sure it works.

V. arrays

– Create a new program in which you declare an array of 6 integers.
– Using a for loop, set the value of each array element to a random number.
– Using another for loop, display the value of each array element.
– Compile and run your program to make sure it works.

VI. more arrays

– Modify the program you created above.
– Instead of setting the value of each array element to a random number, set the value of each array element to be the same as its index.
  – Hint: if the name of your array variable is a, then a[0] = 0 and a[1] = 1, etc.
– Compile and run your program to make sure it works.