CS 102
Introduction to Programming Using C++

Random Numbers

Why Random Numbers?

- There are many uses for random numbers
- In designing a game, you might have to make a choice:
  - Which friend or enemy will appear?
  - Which event will occur next?
  - Which items were left behind for the player to pick up?
- Computers are often used to simulate real-life situations
  - A common use is for retail applications
    - How many checkout lanes should we open?
    - How should we set the traffic lights?

Random Numbers in a Computer

- We call them pseudorandom numbers
  - A computer cannot generate truly random numbers
- It uses an algorithm to generate the next number based on the previous number
- The algorithm is chosen so that the numbers are almost random

Coding

- To use random numbers in a program you need to include cstdlib

  ```
  #include <cstdlib>
  ```

- To use random numbers

  ```
  int x = rand();
  ```

  - These numbers are between 0 and the maximum integer – 1

- To get values between a and b use

  ```
  int x = rand () % (b – a + 1) + a;
  ```

Starting the Process

- How does the computer get the first number?
- It always generates the same one!
  - This is quite useful for testing
- What if you want a new starting value?
- You can call create a starting value based on the time

```
srand (time (0));
```

Questions?

- Are there any questions?