Class 11

Nested Loops with Calculations, Library Functions

Midterm 1 Room Change

- Midterm 1 will be held in RO-230

- RO-230 is on the second floor of the library building

- Exam time is from 9:00 am to 9:50 am

- If you are late, the exam still ends at 9:50 am for you. So please be on time.

Example 0

- Print a 6 x 6 multiplication table:

1 2 3 4 5 6

2 4 6 8 10 12

3 6 9 12 15 18

4 8 12 16 20 24

5 10 15 20 25 30

6 12 18 24 30 36

Example 1

- Write a complete C++ program that does the following:
  - It asks the user to enter a positive integer.
  - The program reads a value *n* entered by the user. If the value is not legal, the program terminates.
  - The program prints a table with *n* lines of output. On output line number *x* the program should list the numbers from 1 to *x* together with their sum.

Enter a positive integer: 4

1 the sum is 1

1 2 the sum is 3

1 2 3 the sum is 6

1 2 3 4 the sum is 10

Functions

- Functions have three parts:
  - name
  - return type
  - input arguments

Library Functions

- Some functions are already written for us

- These are stored in libraries

- In order to use these functions, we need to tell the computer which library to include

sqrt()

- Returns the square root of a number
- Member of the cmath library

Example 2

- Goal:
  - Write a program that calculates the square root of a number.
  - Ask the user if they would like to calculate another square root.
  - Run this process in a loop as long as the user enters a positive number.

rand()

- Returns a pseudo-random integer within the range 1 to some very large number
- Member of the cstdlib library

srand()

- Initializes the random number generator function rand() to some seed value

- Member of the cstdlib library

- We use time(0) as the seed value

- time() is a member of the ctime library

Example 3

- Goal: Simulate rolling a die five times

Example 4

- Goal: Simulate tossing a coin ten times.
  - Keep track of the number of heads and the number of tails tossed.
  - Use 1 for heads and 0 for tails.