Class 11

Nested Loops with Calculations, Library Functions

Exam 1 Room Change

- Exam 1 will be held in RO-230

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

- Exam time is from 6:30 pm to 7:20 pm

- If you are late, the exam still ends at 7:20 pm for you.   So please be on time.

- If you finish the exam early, you can bring it to the front, hand it in, and then exit quietly. Thanks!

Reminders:

• This is a closed book exam. Put away your calculator, cellphone, computer, headphone, notes, books, e.t.c.

• Use the bathroom before you start the exam.

• Have your CUNY ID ready. I will come by to check it.

RO-230 seating plan

Screen (front)

Row	Seats Total	CS111	Seats
1	13	13	1 2 3 4 5 6 7 8 9 10 11 12 13
2	17	13	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
3	21	11	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
4	24	12	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
5	25	13	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
6	28	14	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
7	29	15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
8	30	15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
9	30	15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
10	29	15	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
Total:	246	136	

= take a seat for the one highlighted in yellow

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.
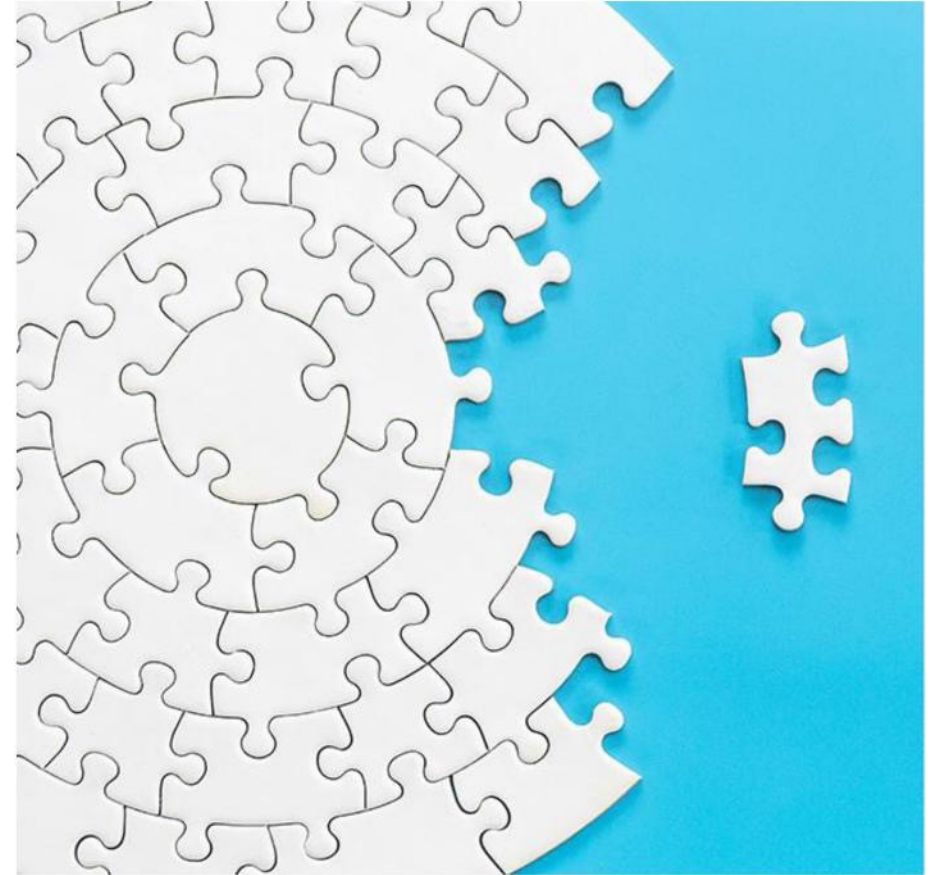
Enter a positive integer: 4

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.