

# Assignment 2

CS 135: Computer Science I  
Spring 2008

## Objectives

1. Learn and demonstrate use of C/C++ data types
2. Learn and demonstrate use of C/C++ mathematical operators
3. Learn and demonstrate prototyping and calling simple value returning functions

Use the `prettyPrint` functions in the file `prettyPrint.cpp` on the class webpage to ensure that your program output follows our specifications. There are two parts to the assignment and note that they have different numbers of points.

## 1 Part 1: DDR 2 (8 points)

Design, code, and test a complete C/C++ program that gets information about game-players and computes their game scores for a game like "Dance, Dance, Revolution (DDR)." In this assignment, the formula for computing the score differs from the formula used for assignment 1. The program should read (from standard input)

- Your first name (string)
- Your game handle (string)
- The number of correct dance steps (int), and
- The number of missed dance steps (int)

In addition to your information, your program should also read your dance partner's information. That is, the program should read

- Your partner's first name (string)
- Your partner's game handle (string)
- Your partner's number of correct dance steps (int), and
- Your partner's number of missed dance steps (int)

The program should then print both your names, handles, score information, and **scores**. We compute the score using the formula

$$100 - 100 \frac{i}{c+i}$$

where  $c$  is the number of correct dance steps, and  $i$  is the number of incorrect dance steps. You must use a value returning function to compute the score. This function must only compute the score and **return** this computed score value to **main**. Here's a prototype for this function:

```
double computeScore(int correct, int missed)
```

**main** will then print this score. Note that there is a significant issue when  $i+c == 0$ . Computers do not deal well with infinity. You will learn to deal with this issue in the next few classes. You need not deal with this issue for the current assignment.

```
sushil@flash ~/classes/135/assignments/as2/code > ./ddr2
Enter your first name :
John
Enter your game handle:
sjl
Enter the number of correct dance steps you made:
100
Enter the number of dance steps you missed:
20
Enter your partner's first name :
Jill
Enter your partner's game handle:
jj
Enter the number of correct dance steps your partner made:
120
Enter the number of dance steps your partner missed:
0
      John      sjl      100      20      83.33
      Jill      jj      120      0      100.00
```

Your output must look as neat and as lined up as it does above. so use the prettyPrint functions from the prior assignment.

## 2 Part II: Bending Moment (12 points)

Design, code, and test a C/C++ program to compute and display the maximum bending moment,  $m$ , of a beam, which is supported on both ends as shown in Figure 1.

The formula for maximum bending moment is:

$$m = xw \frac{(l-x)}{l}$$

where  $x$  is the distance of the weight,  $w$ , from the end of the beam.  $l$  is the length of the beam. Your program should read the values of  $l$ ,  $x$ , and  $w$ , from standard input and write the maximum bending moment of the beam to standard output. In addition, your program should print the

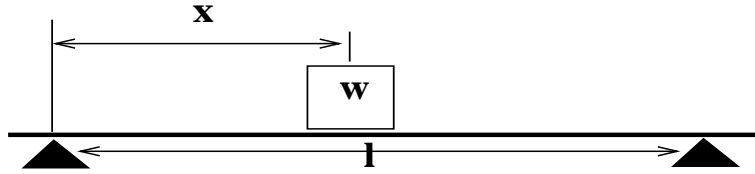


Figure 1: Beam supported on both ends with a weight placed on the beam.

maximum bending moment for a weight that is half the distance as the the weight above ( $0.5 * x$ )  
 Your program must **prototype, use, and define** a function to compute the maximum bending moment according to the formula above. You need not worry about lining up output for this part. Sample Testing (the executable's name is bender).

```
sushil@flash ~/classes/135/assignments/as2/code > ./bender
Enter x (distance of w), w (weight), and l (beam length)
100 100 1000
x = 100, w = 100, l = 1000
The maximum bending moment for distance 100 is: 9000
The maximum bending moment for distance 50 is: 4750
```

Here's another run:

```
sushil@flash ~/classes/135/assignments/as2/code > ./bender
Enter x (distance of w), w (weight), and l (beam length)
50.456 89.654 61.776
x = 50.456, w = 89.654, l = 61.776
The maximum bending moment for distance 50.456 is: 828.913
The maximum bending moment for distance 25.228 is: 1338.12
```

### 3 Turning in your lab assignment

Assume that this format will be used for all your laboratory assignments throughout the semester unless otherwise specified.

Turn in a Folder (Binder) containing:

1. Cover sheet with
2. Assignment Number, your Section Number, your name and your email address, your TA's name
3. Source code and executables on a rewritable CD/USB stick with your name and section number written on the CD/USB stick. This rewritable CD/USB stick should contain.
  - (a) Source code files
  - (b) Executables for each of the sections of this assignment.
4. For each of the sections in this assignment, hardcopy showing the running of your program on test cases.

Ask an instructor or TA if you have questions.