

**Topics Covered:**

If statement and validating input, math library, and output formatting.

**Assignment:****Step 1: Set up a separate directory for this lab**

First log on and open a terminal window to create a separate directory to work on this lab. Issue the following commands to create a directory:

- a. Type `cd 2400/Labs`
- b. Type `mkdir lab2`
- c. Type `cd lab2`

**Step 2: Fixing Programming Errors (30 points)**

- a. Copy the file `lab2Errors.cc` to the current directory (lab2). The file is located in `/home/nabukama/cs2400/lab2/lab2Errors.cc`. Issue the command:

```
cp /home/nabukama/cs2400/lab2/lab2Errors.cc lab2Errors.cc
```

- b. Compile the file `lab2Errors.cc` and fix all the errors in it.
- c. Run the program with the input values: 2 3 1. You should get the following output:

```
x1 = -0.5  
x2 = -1
```

**Step 3: Program (70 points)**

Write a C++ program that calculates the future value of an investment using compound interest. The program should ask the user for the investment amount, the annual interest rate as a percentage, and the time period in years.

Find the future value using the following formula:

$$\text{Future Value} = \text{amount} \times (1 + \text{interest})^{\text{number of years}}$$

Display the input data and future values along with the appropriate labels using two decimal places (see the sample output below).

The program should display an error and terminate if any of the values entered are negative.

**Sample input/output:**

- **Valid Input**

Enter the investment amount, the interest, and number of years:

1000.0 10.0 15

Investment Amount: \$1000.00

Interest: 10.00%

Number of years: 15.00

Future Value: \$4177.25

- **Invalid Input**

Enter the investment amount, the interest, and number of years:

-1000.00 10.0 15

Error: Invalid Input

- **Invalid Input**

Enter the investment amount, the interest, and number of years:

1000.00 -10 10

Error: Invalid Input

**Step 4:**

**Submit your program and lab2Errors.cc to Blackboard under lab2.**

**Hint:** The following will calculate  $2^5$ :

```
#include <cmath>
double value = pow(2, 5);
```