CS 150 Lab 9
Functions

The main objective of today's lab is to practice writing functions.

Be sure your output looks exactly like the specified output.
Be sure to submit the completed project to CS150-02 Lab by Friday at 5pm.

Show the instructor or TA your solution after each function is implemented below.

Lab 9.1

Write a complete C++ program in a project **9_1_Functions** that will implement each of the following functions one at a time.

1) Function: **printHeading** – accepts a string and prints a heading of the following form shown below. The function prototype is:
void printHeading (string);

```
**************************************
* string
**************************************

Executing the following program segment

void printHeading (string);

int main()
{
  printHeading ("Coding Functions");

   return EXIT_SUCCESS;
}

Produces the result

**************************************
* Coding Functions
**************************************
Press any key to continue . . .
```

Show the instructor or TA your solution

2) Function: **absolute** – accepts a double and returns the absolute value of the passed in double. The function prototype is: **double absolute (double);**

```
Executing the following program segment

void printHeading (string);
double absolute (double);

int main()
{
  printHeading ("Coding Functions");
```

```
      cout << endl;

   printHeading ("Absolute Value");
   cout << endl;
   cout << "Absolute Value of -5.5 is " << absolute (-5.5) << endl;
   cout << "Absolute Value of 5.5 is " << absolute (5.5) << endl << endl;

   return EXIT_SUCCESS;
}
```

Produces the result

```
****************************************
* Coding Functions
****************************************


****************************************
* Absolute Value
****************************************


Absolute Value of -5.5 is 5.5
Absolute Value of 5.5 is 5.5


Press any key to continue . . .
```

Show the instructor or TA your solution

3) Function: **isMultiple** – accepts two integer values and returns true if the second value is a multiple of the first number. The function prototype is: **bool multiple (int, int);**

Executing the following program segment

```
void printHeading (string);
double absolute (double);
bool isMultiple (int, int);


int main()
{
   printHeading ("Coding Functions");
   cout << endl;

   printHeading ("Absolute Value");
   cout << endl;
   cout << "Absolute Value of -5.5 is " << absolute (-5.5) << endl;
   cout << "Absolute Value of 5.5 is " << absolute (5.5) << endl << endl;

   printHeading ("Is 2 a multiple of 3?");
   cout << endl;
   if (isMultiple (3, 2))
   {
      cout << "Is a multiple" << endl << endl;
   }
   else
   {
      cout << "Is not a multiple" << endl << endl;
```

```
    }

    return EXIT_SUCCESS;
}

Produces the result

*****************************************
* Coding Functions
*****************************************

*****************************************
* Absolute Value
*****************************************

Absolute Value of -5.5 is 5.5
Absolute Value of 5.5 is 5.5

*****************************************
* Is 2 a multiple of 3?
*****************************************

Is not a multiple

Press any key to continue . . .
```

Show the instructor or TA your solution

Optional Challenge:

The following function is not required in your final lab solution for this week, but as long as there is lab time, you must stay in the lab working on this problem.

4) Function: **round** – accepts a double and a number of digits to round the value to. The value passed back is the rounded double value. The function prototype is:
double round (double, int);

```
Executing the following program segment

void printHeading (string);
double absolute (double);
bool isMultiple (int, int);
double round (double, int);

int main()
{
  printHeading ("Coding Functions");
  cout << endl;

  printHeading ("Absolute Value");
  cout << endl;
  cout << "Absolute Value of -5.5 is " << absolute (-5.5) << endl;
  cout << "Absolute Value of 5.5 is " << absolute (5.5) << endl << endl;

  printHeading ("Is 2 a multiple of 3?");
  cout << endl;
```

```cpp
  if (isMultiple (3, 2))
  {
    cout << "Is a multiple" << endl << endl;
  }
  else
  {
    cout << "Is not a multiple" << endl << endl;
  }

  printHeading ("Rounding a Value");
  cout << endl << "Rounding Value of 12.3456 to one places is "
       << round (12.3456, 1);
  cout << endl << "Rounding Value of 12.3456 to two places is "
       << round (12.3456, 2);
  cout << endl << "Rounding Value of 12.3456 to three places is "
       << round (12.3456, 3) << endl << endl;

  return EXIT_SUCCESS;
}
```

Produces the result

```
***************************************
* Coding Functions
***************************************


***************************************
* Absolute Value
***************************************

Absolute Value of -5.5 is 5.5
Absolute Value of 5.5 is 5.5


***************************************
* Is 2 a multiple of 3?
***************************************

Is not a multiple


***************************************
* Rounding a Value
***************************************

Rounding Value of 12.3456 to one places is 12.3
Rounding Value of 12.3456 to two places is 12.35
Rounding Value of 12.3456 to three places is 12.346

Press any key to continue . . .
```

1) Your program is to compile without any errors or warnings.

Once your project is complete, place your solution PUNetIDLabs into the CS150-02 Drop folder on Turing. Your solution is to have ALL previous projects completely working and correct.