Name: *(as it would appear on official course roster)*	
Umail address: @umail.ucsb.edu	section
Optional: name you wish to be called if different from name above.	
Optional: name of "homework buddy" (leaving this blank signifies "I worked alone"	

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h04: Chapter 4: Predefined and programmer defined functions

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ready?	assigned	due	points
true	Fri 04/20 09:00AM	Fri 04/27 11:59PM	20

You may collaborate on this homework with AT MOST one person, an optional "homework buddy".

MAY ONLY BE TURNED IN IN THE LECTURE/LAB LISTED ABOVE AS THE DUE DATE, OR IF APPLICABLE, SUBMITTED ON GRADESCOPE. There is NO MAKEUP for missed assignments; in place of that, we drop the three lowest scores (if you have zeros, those are the three lowest scores.)

Read Chapter 4, sections 4.1 - 4.3. Please note that while the book does not cover number representation, it is an important concept for this class. Questions 3 to are meant to give you more practice with number representation. These should be answered based on material presented in lectures 5 and 6. You don't need to turn this homework in. To earn credit for this homework, complete the corresponding quiz on gauchospace AFTER you have completed the pen and pencil version of the homework. The quiz will be available one day before the due date indicated on the homework.

Please:

- **No Staples**.
- **No Paperclips**.
- **No folded down corners**.

PLEASE MARK YOUR HOMEWORK CLEARLY, REGARDLESS OF IF YOU WRITE IT OUT IN INK OR PENCIL!

1. (2 pts) What is a flag in a program and of what use is it?

   A flag is a variable that changes value to indicate that some event has taken place. For example, it can be used to indicate the end of a loop.

2. (2 pts) What is type casting and how is it performed in C++?

   Type casting is way to covert from one type to another. For example from int to double or from double to int. It is performed in two ways. It is done using the static_cast keyword or just using the type to convert to followed by (). Fo example if you have a integer variable x, and you want to cast it to double you can either say static_cast<doubl e>(x) or double(x)

3.(5 pts) Which of these uses of type casting will NOT ensure that f is 1.5? Answer should be (ex1), (ex2), (ex3), or (ex4) (or a combination of those).

```
int a(1), b(2), c(2), d(2), e(2);
double f;

f = (a + b)*c / static_cast<double>(d + e); // (ex1)
f = static_cast<double>(a + b)*c / (d + e); // (ex2)
f = (a + b)*static_cast<double>(c) / (d + e); // (ex3)
f = static_cast<double>((a + b)*(c) / (d + e)); // (ex4)
```

ex1. (1+2)*2/4.0 = 3*2/4.0 = 1.5

ex2. 3.0*2/4 = 1.5

ex3. 3*2.0/4 = 1.5

ex4. double(3*2/4) = 1.0

(Last option): ex4

4.(3 pts) We talked about three concepts that are very important to keep straight, and not confuse: (a) function declaration, (b) function definition, and (c) function call. Here is a short C++ program, with line numbers. Please indicate after the program which line number (or range of line numbers, e.g. 3-5 or 7-14) contains the function prototype, function definition, and function call for the isDivisibleBy function.

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```
1  #include <iostream>
2  using namespace std;
3
4  bool isDivisibleBy(int a, int b);
5
6  int main() {
7     cout << "result for (15,5) is " << isDivisibleBy(5,15) << endl;
8     cout << "result for (15,5) is " << isDivisibleBy(5,15) << endl;
9     return 0;
10 }
11
12 bool isDivisibleBy(int a, int b) {
13    return ( a % b == 0 );
14 }
```

Declaration

function call

function definition

5.(8 pts) Write a function declaration and a function definition for a function that takes one argument of type int and one argument of type double, and that returns a value of type double that is the average of the two arguments?

double foo (int x, double xy) ;// Declaration

double foo (int x, double y) {

return (x+y)/2.0

}