

Name: \_\_\_\_\_

SSN: \_\_\_\_\_

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## CS 12 - Midterm 1 October 24, 1997

Be sure to read each problem carefully and follow the directions. Points may be marked off if you do not follow the directions. For example, if the problem asks you to write a function, do not write an entire program. Please feel free to ask if you have any questions.

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TOTAL	60	



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1. (4 pts) Given the following code.

```
(a) double x = 107.88;
     double y;
     cout << setfill('*') << setprecision(2);
     cout << setiosflags(ios::fixed);
     cout << setw(10) << x << endl;
```

(b) Show the output.

(c) If we added the following code, explain why the output of the two numbers may not be formatted nicely together. Also explain how you would fix it.

```
cout << "Enter a value: ";
cin >> y;
cout << y << endl;
```

2. (4 pts) Show how to output a floating point number  $y$  with a precision of 2 and a width of 8 using **printf**.

3. (6 pts) Assume each set of code below is separate and is given the input

```
“Good luck on this test\n”
```

Show the output and show what is left in the input buffer. Be sure to be very clear about all characters.

- (a) 

```
char buf[30];  
cin >> buf;  
cout << buf;
```
- (b) 

```
char buf[30];  
cin.getline(buf, 30, '\n');  
cout >> buf;
```
- (c) 

```
char buf[30];  
cin.get(buf, 30, '\n');  
cout >> buf;
```

4. (4 pts) Define pass-by-value and pass-by-reference. Be sure to explain what is passed as well as explain the results or effects.

5. (8 pts) Write a recursive function that takes in one integer parameter, computes the fibonacci equivalent of that number, and returns that value. The fibonacci value of a number is defined by the following:

$$fibonacci(n) = fibonacci(n - 1) + fibonacci(n - 2)$$

$$fibonacci(1) = 0$$

$$fibonacci(2) = 1$$

6. (5 pts) Write a function called *Update* that updates the value of a parameter *a* based on the value of a second parameter *b*. If *b* is less than zero, *a* should be reset to 100, otherwise *a* should be decremented. Be sure to use good passing techniques. You cannot use C++ reference parameters.

7. (5 pts) Given the following code, what are the types of the following expressions? If an expression is illegal, write “illegal”.

```
int numbers[20][5];
int x;
int *ip;
```

- (a) numbers
- (b) numbers[3][2]
- (c) numbers[12]
- (d) &x
- (e) \*ip

8. (6 pts) Show the values of each element in the array *A* after the following code has been performed.

```
int A[6] = {9,8,7,6,5,4};
int *ip;
int x = 3;
ip = A;
*ip = 16;
ip++;
(*ip)++;
ip = ip + x;
*ip = *ip + 5;
ip++;
*ip = 10 + (*ip - 1);
*(ip - 2) = 11;
```

9. (18 pts) Write a program that uses a dynamically allocated array to store integers that are read from a user specified input file. The user should give the size of the array and the name of the file. Numbers from the file should be read and stored in the array until either the array is full or the file is empty. The numbers in the file may appear in any format.