

CS14 - Proficiency Exam
20 points possible

1. (3 pts) What is the purpose of a constructor? Should it be public or private?

2. (3 pts) What is the purpose of a destructor? Should it be public or private?

3. (5.25 pts) Given the following snippet of code:

```
class info {
public:
    string name;
    int *x, *z;
    double y;
    int a;
};

int main ( ) {
    info allInfo[10];
    info* moreInfo = new info;
    int counter;
    return 1;
}
```

Write the datatype of each of the following expressions or write illegal if the expression is not valid. For example, the datatype of “counter” is an int.

a) allInfo[5].name

b) moreInfo[4].y

c) allInfo.y

d) allInfo[1]->a

e) allInfo[9].x

f) moreInfo

g) Can you find anything wrong with this code?

4. (5.25 pts) Given the following snippet of code:

```
int x = 1;
int* ptr1 = NULL;
int* ptr2 = 0;
int* ptr3 = &x;
int* ptr4 = x;
*ptr3 = 2;
```

Describe what the following statements will produce (either what will be printed or what will happen).

a) `cout << ptr1 << endl;`

g) `cout << *ptr2 << endl`

c) `cout << ptr3 << endl;`

d) `cout << ptr4 << endl;`

e) `cout << x << endl;`

f) `cout << *ptr1 << endl;`

i) `cout << *ptr4 << endl;`

5. (3.5 pts) A string can be stored as an array of characters. To signify the end of the string within the character array, the array location after the last character in the string is set to the null character '\0'. So if the string "word" was stored in a large enough character array, the character array would contain the following characters: 'w' 'o' 'r' 'd' '\0'. Write a recursive function to print a character array in reverse order. You may assume that the array is large enough to store the word and the null terminating character. Syntax will be graded. State any preconditions/assumptions you may have for your function parameters.