MTH 4300: Algorithms, Computers, and Programming II

Fall 2024

Midterm

1 TRUE OR FALSE

1. A stack overflow is when you run out of memory on the heap
2. An attribute refers to a variable defined inside a class
3. Is this correct syntax: string a = 'apple';
4. = and == are the same thing in c++
5. Will this for loop ever halt: for(int i =0; i ¡ 10; i=i+3)
6. You can change the size of an array more than once.
7. A pointer is allowed to store another pointer
8. A compiler is used to move files from one directory to another
9. The command cp list all the files in the current working directory
10. Is this syntax correct:

```
int a =5;
int* p = a;
```

Solutions:

1. F
2. T
3. F
4. F
5. T
6. F
7. T
8. F
9. F
10. F

2 SHORT ANSWER

1. Fix the function below:

```
int my function(int param1, int param2)
{
cout<<parm2<<endl;
double param3 = param1/param2;
return param3;
```

2. Whats a memory leak and how is it caused.
3. Your cpu can only read what type of files? (the answer is not an extension like .out)
4. Name one reason why docker is useful
5. What is 49%5 equal to?
6. What is the main difference between a struct and a class?
7. What is the negation operator for boolean statements?
8. Write the code to create a 2d array on the heap.
9. What does new do?
10. In recursion, if you do not define , then the recursive function will never stop.

3 CODING

1. Write a c++ class to describe a dragon. Make sure to include at least 3 attributes(set to private), 3 methods(set to public), and a constructor(set to public). Write a main function and create 2 objects in the main. Figure out a way to print one of your attributes in the main by calling one of your methods.
2. Ask the user to input the size of an array, then create a 1d array on the heap, such that for each index you store the (index + 1). So at index 0 it should store 1, index 1 should store 2 and so forth. Write a recursive function that computes the sum of only the odd indices. The function should work for arrays of any size.

Solutions:

1. coding_question1.cpp
2. coding_question2.cpp