MTH 4300: Algorithms, Computers, and Programming II

Fall 2024

Midterm Review

1 TRUE OR FALSE

1. The command to compile and renamea file is: g++ main.cpp -o main
2. Dockers MAIN purpose is to make programs faster
3. the float data type takes up more memory in a program than the double
4. while loops are used when you need a program to loop, and the number of times it will loop is detetmined at run time.
5. Is this syntax correct: int matrix[3][3] = {1, 2, 3},{4, 5, 6},{7, 8, 9};
6. Base case for recursion is always required
7. Arrays are technicaly pointers
8. new is used to mark an item as never seen before
9. A method refers to a private variable in a class
10. All variables on the heap must be referenced using pointers

2 SHORT ANSWER

1. Name one function defined inside iostream
2. What is the terminal command to create a new folder?
3. Fix the function below:
   void my_function(int param1, param2)
   {
   cout<"hello"<<endl;
   return 7;
   }
4. What is 28%8 equal to?
5. What does the sizeof function return ?
6. Whats a disadvantage of recursion?
7. Set a pointer to point to nothing
8. Whats a dangling pointer and how is it caused.
9. For private attributes of a class, what is the name of the special method used to set the values of the attributes?
10. The variable int* pointer = &x; is stored on the heap or the stack?

3 CODING

1. Write a c++ class to describe a toaster. 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. Write a main function that creates a 5 by 5, 2d integer array(on the heap or stack whatever you prefer). Then prompt the user to enter a row number x, and a value y. For row x, fill up each entry with (y + column number).
3. What does the following code print:

   int x = 10;
   int* y = &x;
   x=17;
   *y=22;
   cout<<x<<endl;

4. What does the following code print:

```
#include<iostream>

using namespace std;

void func(int n);

int main()
{
    func(10);
    return 0;
}


void func(int n)
{
    if(n==0)
    {
        cout<<endl;
        return;
    }

    cout<<"#";
    func(n-1);
    cout<<"%";
}
```

4 SOLUTIONS

4.1 TRUE OR FALSE

1. true
2. false
3. false
4. true
5. false
6. true
7. true
8. false
9. false
10. true

4.2 SHORT ANSWER

1. cin
2. mkdir
3. int my_function(int param1,int param2)

   cout<<"hello"<<endl;
   return 7;

4. 4
5. the number of bytes for the type of the input variable
6. It can cause a stack overflow
7. int* ptr=nullptr;
8. When a pointer points to memory that has been freed. It is caused after you use the delete operator and forget to set the ptr to nullptr.
9. constructor
10. stack

4.3 CODING(files below located inside this repo)

1. coding_question1.cpp
2. coding_question2.cpp
3. coding_question3.cpp
4. coding_question4.cpp