Practice test for midterm 1

September 19, 2019

1 Basics of C++

► How many comments, directives, declarations, definitions, and statements occur in the following program?

```
/*
 * myprogram.cpp
 */
#include <iostream>
#include <string>
using namespace std;

int main() {
    cout << "Hello"; cout << " to you" << endl;
    int i;
    cout << "Enter your age: ";
    cin >> i;
    cout << "TMI, pal" << endl;
}
```

- Comments:

- Directives:

- Declarations:

- Definitions:

- Statements:

▶ Circle all the mistakes (errors) in the following program, and mark what changes you'd have to make to fix them.

```cpp
#include <iostreams>
using namespace std

int main()
    cout << "Hello, sir! << endl;
    int i;
    cin >>> i;
    cout << "OK!" >> endl
}
```

▶ Write the output that the following program will produce.

```cpp
int main() {
    cout << "Hello!" << endl;/*
    cout << "Goodbye!" << endl;*/
    cout << "Hello again." << endl;
    return 0;
    cout << "Goodbye for good!" << endl;
}
```

▶ Label each of the following either *declaration* or *statement*:

- int x = 12 * 2;

- string s = "hello";

- cout << x << s;

- string t = s.substr(0,3);

- using namespace std;

- return 0;

2 Expressions, variables, and types

▶ For the following code fragment, trace through it to determine the final values of the variables a and b.

```
int a = 0, b = 1;
a = a + b;
int c = a = b;
c = a + b;
a = 2 * c;
b = a + b * 2;
```

▶ Write a program which reads an entire line of input from the user, and then prints it back out, as if it was a quote from Michael Scott. For example, if the user entered

```
I don't see the point of this.
```

the program should print

```
"I don't see the point of this."
    ~Michael Scott
```

▶ Describe what each of the following *character escapes* will produce when printed (sent to cout):

* \n

* \\

* \t

* \"

* \b

► Here is a sample program that reads three numbers from the user, and then prints out one of the three. Describe, in English, which of the three it prints. (You might try tracing through it with some inputs to see what it does.)

```cpp
int main() {
    cout << "Enter three integers: ";
    int a, b, c;
    cin >> a >> b >> c;

    int d = b < c ? b : c;

    cout << (a < d ? a : d);
}
```

3 Conditional and looping statements

▶ Describe what the following program will print out, depending on the user's input:

```cpp
int x;
cin >> x;
if(x < -10) {
    cout << -10;
}
else if(x > 10) {
    cout << 10;
}
else {
    cout << x;
}
```

▶ Simplify the following if-else statements, by simplifying the condition:

- ```cpp
  if(x < 0 && x > 0)
      cout << "OK";
  else
      cout << "Not cool";
  ```

- ```cpp
  if(!(x < y || x > y))
      cout << "Yes";
  else if(x == y)
      cout << "No";
  else
      cout << "Maybe?";
  ```

- ```cpp
  string s = ...;
  if(s.empty() == (s.length() == 0))
      cout << "PoTAYto";
  else
      cout << "PoTAHto";
  ```

▶ Write a `while` loop which will print out all the even numbers from 2 to 20.

▶ Write a `do-while` loop which will count *down* to 1 from the number entered by the user. If the user enters a number < 1 it should print 1 and stop.

```cpp
int n;     // Count down from n
cin >> n;
// Your loop goes here
```

▶ Translate the following `for` loop into a `while` loop that does the same thing:

```
for(int x = 0; x < 100; x = x*x + 1) {
    cout << x;
    if(x % 7 == 0)
        break;
}
```

(Bonus question: what will this loop print out?)