COSC1076 | Advanced Programming Techniques

Revision Questions | Week 02

These are self-revision questions, to help you track if you are understanding the weekly course content.

You should FIRST answer these questions using "pen-and-paper". Only after this should you test your answers by writing and compiling programs.

1. What is the difference between a *declaration*, *definition*, and *initialisation*? Give an example of each.
2. What is the purpose of a namespace?
3. What is a global variable?
4. What is the purpose of a function prototype?
5. How are parameters in a function passed?
6. What is the key distinction between arrays in Java and C++?
7. How is a string implemented in C/C++?
8. What character denotes the "end" of a string?
9. Why is it considered to be bad style to use the following type of namespace import?

```
using namespace std;
```

10. What will be the output of the following program?

```
#include <iostream>

#define EXIT_SUCCESS 0

namespace example {
   void foo() {
      std::cout << "example::foo" << std::endl;
   }

   namespace deep {
      void foo() {
         std::cout << "example::deep::foo" << std::endl;
      }
   }
}

void foo() {
   std::cout << "foo" << std::endl;
}

int main(void) {
   example::foo();
   return EXIT_SUCCESS;
}
```

11. Using the below program:
    (a) What will be the output of the program?
    (b) What is the exact contends of the `string` variable?

```cpp
#include <iostream>

#define EXIT_SUCCESS 0

int main(void) {
    char string[LENGTH] = "zyxw\0abcd";
    std::cout << string << std::endl;

    return EXIT_SUCCESS;
}
```

12. What is a pointer?
13. What is a reference?
14. Why must a reference be initialised when it is declared?
15. Write a simple function that is given a pointer to a `double` and increments the value of the `double` by 1.
16. Do the same as the above question, except the function is given a reference to a `double`.
17. What is the problem with the below program?

```cpp
#include <iostream>

#define EXIT_SUCCESS 0

int main(void) {
    int value = 7;
    int* ptr = NULL;

    std::cout << *ptr << std::endl;

    return EXIT_SUCCESS;
}
```

18. Explain why the `scanf` function requires pointers.
19. What are the three scoping contexts in a C++ class?
20. Given an example C++ class declaration and definition, where the class containts:
    - One public constructor
    - One private variable
    - One public method