Sample Questions For Exam 1

These are the types of questions you will find on the midterm exam. They indicate the level of
difficulty and format of the questions. The absence of a topic does not imply that it will not be
covered on the exam. Consult the list of exam 1 topics for that information.

1. What is the output of the program below?

```cpp
#include <iostream.h>
using namespace std;
int main()
{
    int n = 3;
    while (n >= 0) {
        cout << n * n << endl;
        --n;
    }
    cout << n << endl;
    while (n < 4)
        cout << ++n << endl;
    cout << n << endl;
    while (n >= 0)
        cout << (n /= 2) << endl;
    return 0;
}
```

2. What is the output of the following program?

```cpp
#include <iostream.h>
int main()
{
    for ( int i = 1; i <= 6; i++ ) {
        for ( int j = 5; j >= 1; j-- )
            std::cout << i + j;
        std::cout << "\n";
    }
    return 0;
}
```

3. Write a void function named `uppercase()` that takes a string argument and converts it to
   uppercase.
4. What is the output when the following code fragment is executed?

```cpp
int found = 0, count = 5;
if (!found || --count == 0)
    cout << "danger" << endl;
    cout << "count = " << count << endl;
```

5. A positive integer \( n \) is said to be prime (or, "a prime") if and only if \( n \) is greater than 1 and is divisible only by 1 and \( n \). For example, the integers 17 and 29 are prime, but 1 and 38 are not prime. Write a function named `is_prime()` that takes a positive integer argument and returns as its value \textbf{true} if the argument is prime and returns the value \textbf{false} otherwise. Thus, for example,

```cpp
cout << is_prime(19) << endl; // will print true
cout << is_prime(-13) << endl; // will print false
```

6. Write a function named `ordinal_name()` that takes an integer argument in the range from 1 to 5, inclusive, and prints the English ordinal for that integer’s on the computer screen. A newline character should be sent to the screen following the ordinal name. If the argument is not in the required range, then the function should print \textbf{error} followed by the newline character. Thus, for example,

- the statement `ordinal_name(3);` should print \textit{third} on the screen;
- the statement `ordinal_name(1);` should print \textit{first} on the screen;
- the statement `ordinal_name(6);` should print \textit{error} on the screen.

7. Given the function prototype,

```cpp
// sum(a,b) returns the sum of doubles a and b
double sum(double a, double b);
```

Write a single assignment statement that assigns the value of the expression

\[
\frac{x + y}{x^2 + y^2}
\]

to the \textbf{double} \( z \) without using the "+" operator. Assume that \( x, y \) and \( z \) are all declared type \textbf{double}, and that \( x \) and \( y \) have been assigned values.

8. Determine if the statements below are true or false.

- \textbf{T F} Assuming \( n \) is an \textbf{int} variable, \( ++n \) and \( n++ \) do the exact same thing.
- \textbf{T F} A variable used in the definition of a function \textit{myFunction()} should be declared in the \textit{main()} function.
- \textbf{T F} To indicate that 100 locations should be reserved for integer array \( p \), the programmer writes the declaration: \( p[100] \);
- \textbf{T F} Empty parentheses following a function name in a function prototype indicate that the function does not require any parameters to perform its task.
- \textbf{T F} An array can store many different types of values.