CSCI-240
Exam I: Test Prep

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Contents

1 Quiz I

1. (2 points) Most lines in a C++ program end with a
   - ; (semi-colon)
2. (2 points) `main()` marks the beginning of a C++ program. What C++ reserved word precedes it?
   - `int`
3. (2 points) What is the correct way to declare an integer variable named "score"?
   - `int score;`
4. (2 points) Given the following declaration:

   ```
   double x;
   ```

   What is the value of x?
   - Garbage
5. (2 points) According to the lecture notes, the two main conceptual components of a program are _____ and _____.
   - Data + instructions
6. (2 points) Given the following:

   ```
   double price = 30.00;
   double tax = 1.80;
   double sum;

   sum = price + tax;
   ```

   Explain in detail what the last line does in terms of variables, calculations, and assignment of values.
   - Assigns the sum of the two double variables *price* and *tax* to the variable *sum*. The computation would be $30.00 + 1.80 = 31.8$
7. (2 points) When you write an illegal C++ statement and try to compile and run the program, you will get a
   - compile error
8. (2 points) What is the value (in C++) of the expression $4/2 \times 2$?
   - 4
9. (2 points) What is the value (in C++) of the expression 3/2?
   - 1
10. (2 points) Which data type has the largest range?
    - `double`
11. (2 points) About how many decimal places of accuracy does a `float` have?
    - 6
12. (2 points) Modify (rewrite) the following instruction so that the subtraction is evaluated first:

    ```
    i = a * b / (c - d);
    ```

2 Quiz II

1. (2 points) What instruction will display data on the screen from a C++ program?

   - `cout`

2. (2 points) About how many decimal places of accuracy does a `float` have?

   - 6

3. (2 points) The formula for converting a Fahrenheit temperature to Centigrade is $5/9(F - 32)$. What is wrong with writing it in C++ as

   ```
   C = 5/9 * (F - 32);
   ```

   assuming that C and F are both declared as doubles, and F has a valid value.

   - Integer division

4. (2 points) What is the value of the expression 25%3?

   - 1

5. (2 points) Explain in detail what the following instruction does (assuming `i` is declared as `int`):

   ```
   cin >> i;
   ```

   Answer: The instruction `cin >> i;` is used for input in C++. Specifically, it waits for the user to enter a value from the keyboard. Once the user enters a value and presses the Enter key, the entered value is stored in the variable `i`. It's important to note that since `i` is declared as an `int`, the user is expected to enter an integer value. If the user enters a non-integer value, the behavior might be unpredictable or result in an error.

6. (2 points) Suppose you have two integer variables (named `num` and `sum`) with valid values. Write a single `cout` instruction to display them as follows:

   ```
   num is __
   sum is __
   ```

   the underscore characters will show the actual values in `num` and `sum` - for example:

   ```
   num is 4
   sum is 24
   ```

   ```
   std::cout << "num is " << num
       << std::endl
       << "sum is " << sum;
   ```

7. (2 points) Name two libraries that should be `#include'd` at the top of a C++ program.

   - iostream
   - iomanip

8. (2 points) Assuming that two floating point numbers have been saved in the variables `num1` and `num2`, write a chunk of program code that will display the integer result of the sum of `num1` and `num2`. For example, if `num1` contains 2.4 and `num2` contains 2.5, then the value 4 should be displayed.

```
int sum = num1 + num2;
cout << sum;
```

9. (2 points) Write a chunk of program code that asks the user to enter two floating point numbers and saves the values in two `float` variables called `val1` and `val2`.

```
float num1, num2;
cout << "Enter two floating point numbers";
cin >> num1 >> num2;
```

3 Quiz 3

1. (2 points) Which of the following increments x by 1?
   - $x+=1;$
2. (2 points) Select the three control structures that (along with sequence) will be studied in this course.
   - decision
   - repetition/looping
   - branch and return/function calling
3. (2 points) Name one command that is used to implement the decision statement control structure that will be studied in this course.
   - if
4. (2 points) Name the 3 C++ statements used to create a loop.
   - for
   - while
   - do while
5. (2 points) What will the following code display on the screen and where will it display?

```
for (i = 0; i < 5; i++)
  cout << "\n";
  cout << i;
```

   - Assuming these incompetent morons can write a valid for loop, this will display numbers 0-4, each on a separate line
6. (2 points) Write a for loop to display the first 5 multiples of 10 on one line. For example: 10 20 30 40 50

```
for (int i = 10; i <= 50; i+=10) {
    cout << i << " ";
}
```

7. (2 points) Write a while loop to display the first 5 multiples of 10 on one line. For example: 10 20 30 40 50

```
int control = 10;
while (control <= 50) {
    cout << control << " ";
    control+=10;
}
```

8. (2 points) When is the 3rd subexpression in `for (--; --; --)` statement executed?
   - at the end of each iteration
9. (2 points) Write a decision statement to test if a number is even or not. If it is, print "even". If it is not, add 1 to it and print "it was odd, but now it's not".

```
if (num % 2 == 0) {
    cout << "even" << endl;
} else {
    cout << "It was odd, but now its not";
    num+=1;
}
```

- (2 points) Why is a while loop described as "top-driven"?
- Because the condition is checked before each iteration begins

10. (2 points) If a read-loop is written to process an unknown number of values using the while construct, and if there is one read before the while instruction there will also be one
    - at the bottom of the body of the loop

4 Quiz 4

1. (2 points) The three basic flow-of-control patterns are sequence, _____*and*_____.

    2. decision

    3. repetition

(2 points) The three basic loop statements in C++ are while, _____, and _____.

- do while
- for

(2 points) Write a fragment of code that checks a string variable to see if it contains your first name or not, and then prints either "that's me" or "that's not me" accordingly. Assume that the string variable `aName` has a valid string in it before the test is made.

```
if (aName == "nate") cout << "Thats me" << endl;
else cout << "Thats not me" << endl;
```

(2 points) Write a fragment of code that accepts integers from the user until a negative number is entered. The prompt should be "Enter a number (negative to quit):" Add up the numbers and print the sum (not including the negative number). Assume and use the following declarations:

```
int sum = 0;
int num;

cout << "Enter a positive number (negative number to quit): ";
cin >> num;

while (num >= 0) {
    sum += num;
    cout << "Enter a positive number (negative number to quit): ";
    cin >> num;
}
cout << sum;
```

(2 points) Given the variables `top`, `left`, `right`, and `bottom` representing the coordinates of a rectangle's upper left and lower right corners, and variables `ptX` and `ptY`, representing the coordinates of a point, write a condition to test if the point is outside the rectangle. Assume that x increases to the right and that y increases to the top.

```
if ( (ptX < left || ptX > right) || (ptY > top || ptY < bottom) ) cout << "Your outside the rectangle";
else cout << "You're inside the rectangle";
```

(2 points) Write a for loop that does exactly the same thing as the following code:

```
i = 1;
while (i < 11)
  {
  cout << "the square root of " << i << " is " << sqrt(i) << endl;
  i += 2;
}
for (i=1; i < 11; i+=2) {
    cout << "the square root of " << i << " is " << sqrt(i) << endl;
}
```

(2 points) Create a symbolic constant named `PI` to represent the value of pi (3.14) in two different ways.

```
#define PI 3.14
const double PI{3.14};
```

(2 points) Give two reasons why symbolic constants might be used in a C++ program.

- if we have a fixed value in multiple places in our program, this way if we need to change the value we only need to change it in one place.
- to give a identifier for the values, for example all 3.14s in a program can be named PI for better readability

(2 points) What will the following code fragment print?

```
for (i = 0; i < 5; i++);
    cout << i + 1;
cout << i;
```

- 10

(2 points) Suppose

```
x = 0;
y = 5;
```

Is the following condition true or false?

```
if (x > 0 && x < 10 || y == 4)
```

- False

(2 points) Which of the following is a legal way to create a C-style symbolic constant?

- #define MAX_VAL 30