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Checked by groups 2 and 1

# Iomanip Worksheet

## True or False

1. Mark the following statements as true or false.

   a. The extraction operator >> skips all leading whitespace characters when searching for the next data in the input stream.

   **True**

   b. In the statement `cin >> x;,` x must be a variable.

   **True**

   c. The statement `cin >> x >> y;` requires the input values for x and y to appear on the same line.

   **False**

   d. The statement `cin >> num;` is equivalent to the statement `num >> cin;.`

   **False**

   e. You generate the newline character by pressing the Enter (return) key on the keyboard.

   **True**

   f. The function ignore is used to skip certain input in a line.

   **True**

# Reading input and assignment of values to variables

2. Suppose x and y are int variables and ch is a char variable. Consider the following input:

    5 28 36

    What value (if any) is assigned to x, y, and ch after each of the following statements executes? (Use the same input for each statement.)

    ```
    a. cin >> x >> y >> ch;
    ```

    x = 5;
    y = 28;
    ch = '3';

    ```
    b. cin >> ch >> x >> y;
    ```

    x = 28;
    y = 36;
    ch = '5'

    ```
    c. cin >> x >> ch >> y;
    ```

    x = 5;
    y = 8;
    ch = '2';

    ```
    d. cin >> x >> y;
       cin.get(ch);
    ```

    x = 5;
    y = 28;
    ch = ' ';

3. Suppose x and y are int variables and z is a double variable. Assume the following input data:

    37 86.56 32

    What value (if any) is assigned to x, y, and z after each of the following statements executes? (Use the same input for each statement.)

    ```
    a. cin >> x >> y >> z; x = 37, y = 86, z = 0.56
    b. cin >> x >> z >> y; x = 37, y = 32, z = 86.56
    c. cin >> z >> x >> y; x = 86, y = 0,  z = 37
    ```

4. Suppose x and y are int variables and ch is a char variable. Assume the following input data:

13 28 D

14 E 98

A B 56

What value (if any) is assigned to x, y, and ch after each of the following statements executes? (Use the same input for each statement.)

a.  `cin >> x >> y;`
    `cin.ignore(50, '\n');`
    `cin >> ch;`

x = 13;
y = 28;
ch = '1';

b.  `cin >> x;`
    `cin.ignore(50, '\n');`
    `cin >> y;`
    `cin.ignore(50, '\n');`
    `cin.get(ch);`

x = 13;
y = 14;
ch = 'A';

c.  `cin >> y;`
    `cin.ignore(50, '\n');`
    `cin >> x >> ch;`

x = 14;
y = 13;
ch = 'E';

d.  `cin.get(ch);`
    `cin.ignore(50, '\n');`
    `cin >> x;`
    `cin.ignore(50, 'E');`
    `cin >> y;`

x = 14;
y = 98;
ch = '1';

5. Given the input:

46 A 49

and the C++ code:

```cpp
int x = 10, y = 18;
char z = '*';
cin >> x >> y >> z;
cout << x << " " << y << " " << z << endl;
```

What is the output?

**46 0 ***

Suppose that x and y are int variables, z is a double variable, and ch is a char variable. Suppose the input statement is:

```cpp
cin >> x >> y >> ch >> z;
```

What values, if any, are stored in x, y, z, and ch if the input is:

a. 35 62.78      **x = 35, y = 62, ch = '.', z = 0.78**
b. 86 32A 92.6   **x = 86, y = 32, ch = 'A', z = 92.6**
c. 12 .45A 32    **x = 12, y = 0,  ch = undefined, z = undefined**

## Manipulators

6. Which header file must be included to use the function setprecision?

   **iomanip**

7. Which header file must be included to use the function pow?

   **cmath**

8. Suppose that name is a variable of type string. Write the input statement to read and store the input Brenda Clinton in name. (Assume that the input is from the standard input device.)
   **getline(cin, name);**

9. Write a C++ statement that uses the manipulator setfill to output a line containing 35 stars, as in the following line:
   **\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

   **cout << setfill('\*') << setw(35);**

10. What output will be produced when the following lines are executed (assuming the lines are embedded in a complete and correct program with the proper include directives)?

```
cout << "*";
cout.width(5);
cout << 123 << "*" << 123 << "*" << endl;
cout << "*" << setw(5) << 123 << "*" << 123 << "*" << endl;
```

```
*  123*123*
*  123*123*
```

11. What output will be produced when the following lines are executed (assuming the lines are embedded in a complete and correct program with the proper include directives)?

```
cout << "*" << setw(5) << 123;
cout.setf(ios::left);
cout << "*" << setw(5) << 123;
cout << right;
cout << "*" << setw(5) << 123 << "*" << endl;
```

```
*  123*123  *  123*
```

12. What output will be produced when the following lines are executed (assuming the lines are embedded in a complete and correct program with the proper include directives)?

```
cout << "*" << setw(5) << 123 << "*" << 123 << "*" << endl;
cout << showpos;
cout << "*" << setw(5) << 123 << "*" << 123 << "*" << endl;
cout.unsetf(ios::showpos);
cout.setf(ios::left);
cout << "*" << setw(5) << 123 << "*" << setw(5) << 123
     << "*" <<endl;
```

```
*  123*123*
* +123*+123*
*123  *123  *
```

## Input with Strings and Chars

13. Suppose that age is an int variable and name is a string variable. What are the values of age and name after the following input statements execute:

```
cin >> age;
getline(cin, name);
```

if the input is:

a. 23 Lance Grant => age = 23, name = "Lance Grant"
b. 23            => age = 23, name = ""
   Lance Grant


14. Suppose that age is an int variable, ch is a char variable, and name is a string variable. What are the values of age and name after the following input statements execute

```
cin >> age;
cin.get(ch);
getline(cin, name);
```

if the input is:

a. 23 Lance Grant => age = 23, ch = ' ',  name = "Lance Grant"
b. 23            => age = 23, ch = '\n', name = "Lance Grant"
   Lance Grant


**Recall:** that `cin` statements ignore all whitespace characters. If we want to actually read in a whitespace character we need to use `cin.get()`. We have two versions:

```
    cin.get();        //we can output the character we get, or
                      //use an = to assign to a variable
    cin.get(c);       //we can output the character and assign it
                      //to a variable
```

15. Suppose c is a variable of type *char*. What is the difference between the following two statements?

```
cin >> c;
```
and
```
cin.get(c);
```

**In the first statement, any whitespace in the stdin will be ignored and only the first non-whitespace char will be assigned to c. The second statement will not ignore any whitespace.**

16. Consider the following code (and assume that it is embedded in a complete and correct program and then run):

```
char c1, c2, c3, c4;
cout << "Enter a line of input:\n";
cin.get(c1);
cin.get(c2);
cin.get(c3);
cin.get(c4);
cout << c1 << c2 << c3 << c4 << "END OF OUTPUT";
```

If the dialogue begins as follows, what will be the next line of output?

Enter a line of input: **a b c d e f g**

a b END OF OUTPUT