

Instructions: This homework assignment focuses primarily on some of the basic syntax and semantics of C++. The answers to the following questions can be determined from Chapters 3 and 4 of the lecture notes and Chapters 2 through 4 of the text. When code fragments are given, assume the presence of any include directives that are needed to ensure compilation.

After you have analyzed the questions and decided what answers you believe are correct, you may find it useful to write some short programs to test your logic.

Opscan forms will be passed out in class. Write your name and code your ID number on the opscan form. Turn in your completed opscan at class on Thursday Sept 27 or Friday Sept 28.

For questions 1 through 3, select the value of the given C++ arithmetic expression. Note that the presence of a decimal point indicates a value is a `double`, rather than an `int`.

1. $9.0 / 6.0 + 5 / 2$

- | | | |
|--------|--------|------------------|
| 1) 3 | 3) 3.5 | 5) 4.0 |
| 2) 3.0 | 4) 4 | 6) None of these |

2. $9 * 3 / 4$

- | | | |
|------|---------|------------------|
| 1) 0 | 3) 6.75 | 5) None of these |
| 2) 6 | 4) 7 | |

3. $14 \% 7 + 3 \% 4$

- | | | |
|---------|------|------------------|
| 1) 0 | 3) 3 | 5) None of these |
| 2) 2.75 | 4) 5 | |
-

For questions 4 through 6, select the value assigned to the relevant variable, given the declarations:

```
int    anInt;  
double aDble;
```

4. `aDble = 5 / 4;`

- | | | |
|--------|------------------------|------------------|
| 1) 0.0 | 3) 1.25 | 5) None of these |
| 2) 1.0 | 4) This is not allowed | |

5. `anInt = 5 / 4;`

- | | | |
|------|------------------------|------------------|
| 1) 0 | 3) 1.25 | 5) None of these |
| 2) 1 | 4) This is not allowed | |

6. `aDble = 5 / 2 + 3.0;`

- | | | |
|--------|--------|------------------|
| 1) 0.0 | 3) 5.5 | 5) None of these |
| 2) 5.0 | 4) 6.0 | |
-

7. At the hardware level, the values 5 and 5.0 are stored in exactly the same way.

- | | | |
|---------|----------|----------|
| 1) true | 2) false | 3) maybe |
|---------|----------|----------|
-

For questions 8 through 11, assume the following variables have been declared

```
int    anInt;
double aDble;
char   aChar;
```

and assume the standard input stream `cin` contains the following values, separated by tabs:

1.2	4.5	A	-46.32
-----	-----	---	--------

Determine the value of the indicated variable after the execution of the given statement; each question is independent, that is, each starts with the stream contents shown above.

8. `anInt` after `cin >> anInt >> aChar;`

- | | | |
|--------|------|-------------------------|
| 1) 1 | 3) 2 | 5) The operation fails. |
| 2) 1.2 | 4) 4 | 6) None of these |

9. `aDble` after `cin >> aChar >> aDble;`

- | | | |
|--------|--------|------------------------|
| 1) 1.2 | 3) 4.0 | 5) The operation fails |
| 2) 0.2 | 4) 4.5 | 6) None of these |

10. `anInt` after `cin >> aDble >> anInt;`

- | | | |
|--------|--------|------------------------|
| 1) 2 | 3) 4 | 5) The operation fails |
| 2) '4' | 4) 4.5 | 6) None of these |

11. `anInt` after

```
cin >> aChar;
cin.get(aChar);
cin >> anInt;
```

- | | | |
|------|------|------------------------|
| 1) 1 | 3) 4 | 5) The operation fails |
| 2) 2 | 4) 5 | 6) None of these |

12. What is printed by the statement: `cout << "The answer is" << 30 + 12;`

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|--------------------------|-------------------------|------------------|
| 1) The answer is 30 + 12 | 3) The answer is 42 | 5) None of these |
| 2) The answer is42 | 4) The answer is30 + 12 | |

13. Assuming that all variables are of type double, the correct C++ expression for $\frac{a+bc}{d+e}$ is:

- | | | |
|-------------------------------------|---------------------------------------|------------------|
| 1) <code>a + b * c / d + e</code> | 3) <code>(a + b) * c / (d + e)</code> | 5) None of these |
| 2) <code>(a + b) * c / d + e</code> | 4) <code>(a + b * c) / d + e</code> | |

18. A program specification says that a line of input will start with a text label containing up to 25 characters, followed by a tab character, followed by an integer value; for example:

```
Number of nodes:<tab>293<newline>
```

Here, <tab> and <newline> indicate the occurrence of a single tab character and a single newline character.

Given the specification, which of the following code fragments will successfully read the integer value into the int variable NetSize? Assume that In is an input file stream variable that has been opened on an input file, and that the data in the stream conforms to the specification.

- | | |
|---|---|
| <p>1) In.ignore(25, '\\t');
In >> NetSize;</p> <p>2) In.ignore(30, '\\t');
In >> NetSize;</p> <p>5) All of the above</p> <p>6) 1 and 2 only</p> | <p>3) In.ignore(25, ':');
In >> NetSize;</p> <p>4) In.ignore(50, '\\t');
In >> NetSize;</p> <p>7) 2 and 4 only</p> <p>8) 1, 2 and 3 only</p> <p>9) 1, 2 and 4 only</p> <p>10) None of these</p> |
|---|---|

For questions 19 and 20, assume that the input file Data.txt is:

```
1234567890
1234567890
1234567890
1234567890
```

19. What output would the following code fragment produce?

```
ifstream In;
In.open("Data.txt");
char Value;
In.ignore(15, '7');
In >> Value;
cout << "Value: " << Value << endl;
```

- | | | |
|-------------|-------------|--------------|
| 1) Value: 1 | 5) Value: 5 | 9) Value: 9 |
| 2) Value: 2 | 6) Value: 6 | 10) Value: 0 |
| 3) Value: 3 | 7) Value: 7 | |
| 4) Value: 4 | 8) Value: 8 | |

20. What output would the following code fragment produce?

```
ifstream In;
In.open("Data.txt");
char Value;
In.ignore(15, '\\n');
In.get(Value);
cout << "Value: " << Value << endl;
```

- | | | |
|-------------|-------------|--------------|
| 1) Value: 1 | 5) Value: 5 | 9) Value: 9 |
| 2) Value: 2 | 6) Value: 6 | 10) Value: 0 |
| 3) Value: 3 | 7) Value: 7 | |
| 4) Value: 4 | 8) Value: 8 | |

21. What output would the following code fragment produce?

```
int Value = 42;
cout << "12345678901234567890" << endl;
cout << setw(10) << Value << Value;
```

- | | |
|---|---|
| 1) 12345678901234567890
42 42 | 3) 12345678901234567890
42 42 |
| 2) 12345678901234567890
42 42 | 4) 12345678901234567890
4242 |
- 5) None of these

22. What output would the following code fragment produce?

```
int Value = 42;
cout << "12345678901234567890" << endl;
cout << setw(10) << setfill('.') << Value << setw(10) << Value;
```

- | | |
|--|---|
| 1) 12345678901234567890
.....42 42 | 3) 12345678901234567890
.....42.....42 |
| 2) 12345678901234567890
42.....42..... | 4) 12345678901234567890
42.....42 |
- 5) None of these

23. What output would the following code fragment produce?

```
int TotalInCents = 4209;
int Dollars = TotalInCents / 100;
int Cents = TotalInCents % 100;
cout << "1234567890" << endl;
cout << setw(7) << Dollars << '.' << setfill('0') << Cents;
```

- | | | | |
|-----------------------|------------------------|------------------------|-----------------------|
| 1) 1234567890
42.9 | 2) 1234567890
42.09 | 3) 1234567890
42.09 | 4) 1234567890
42.9 |
|-----------------------|------------------------|------------------------|-----------------------|
- 5) None of these

24. The pattern for an input-failure input loop requires:

- 1) a priming read before the loop.
- 2) a read statement at the beginning of the inside of the loop.
- 3) a read statement at the end of the inside of the loop.
- 4) All of these.
- 5) 1 and 3 only
- 6) 2 and 3 only
- 7) None of these

25. Given the input file below, which of the given code fragments would lead to an input failure? (Consider each code fragment beginning with the original input file contents.)

```
42.5  node  2
```

Assume the following variable declarations and that In is an input stream variable connected to the given file:

```
int    A, B;  
double X;  
string Word;
```

- | | | |
|---------------------|--------------------------|--------------------|
| 1) In >> A >> Word; | 4) In >> A >> Word >> B; | 7) 3 and 4 only |
| 2) In >> A >> X; | 5) All of them | 8) 1, 3 and 4 only |
| 3) In >> X >> A; | 6) 1 and 4 only | 9) None of these |