

Answers to Self-Check Exercises

1. Using the notation <value, type> give the value and type assigned to the object on the left side of the assignment operator.

```
int k;  
k = 2.4;
```

Answer

<2,int>

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2. Using the notation <value, type> give the value and type assigned to the object on the left side of the assignment operator.

```
int j;  
j = 5.9;
```

Answer

<5,int>

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3. Using the notation <value, type> give the value and type assigned to the object on the left side of the assignment operator.

```
int t;  
t = 2.3L;
```

Answer

<2.3,double>

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4. Using the notation <value, type> give the value and type assigned to the object on the left side of the assignment operator.

```
float x;  
x = 3;
```

Answer

<3.0,float>

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5. Give the primary reason for using a `const` definition as opposed to an equivalent non-`const` definition.

Answer

A **`const`** definition informs the compiler that the defined object cannot be modified. The compiler issues an error message if it detects a situation where the object could be modified.

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6. What values are extracted into the objects `Value1` and `Value2` when the input `2.4,4` is processed by the following code fragment?

```
int Value1;  
int Value2;  
cin >> Value1 >> Value2;
```

Answer

`Value1` gets the value `<2,int>`, and `Value2` gets `<undef,int>`

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7. What values are extracted into the objects `Value1` and `Value2` when the input
7.8,0
is processed by the following code fragment?

```
float Value1;  
int Value2;  
cin >> Value1 >> Value2;
```

Answer

`Value1` gets the value `<7.8, float>`, and `Value2` gets the value `<undef,int>`.

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8. What values are extracted into the objects `Value1` and `Value2` when the input `2e3,6` is processed by the following code fragment?

```
int Value1;  
int Value2;  
cin >> Value1 >> Value2;
```

Answer

`Value1` gets the value `<2,int>`, and `Value2` gets the value `<undef,int>`.

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9. Using the notation <value, type> give the value and type assigned to the object on the left side of the compound assignment operator.

```
int i = 3;  
float f = 6.1;  
i += f;
```

Answer

<9,in>

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10. Using the notation <value, type> give the value and type assigned to the object on the left side of the compound assignment operator.

```
int i = 4;  
float f = 6.8;  
f += i;
```

Answer

<10.8,float>

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11. Using the notation <value, type> give the value and type assigned to the object on the left side of the compound assignment operator.

```
short i = 4;  
int k = 6;  
i -= k;
```

Answer

<-2,short>

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12. Using the notation <value, type> give the value and type assigned to the objects k and j.

```
int i = 5;  
int j = 0;  
int k;  
k = ++i;  
j = i;
```

Answer

Object k is assigned <6,int>. Object j is assigned <6,int>.

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13. Using the notation <value, type> give the value and type assigned to the objects k and j.

```
int i = 6;  
int j;  
int k;  
k = i++;  
j = i;
```

Answer

Object i is assigned <6,int>. Object j is assigned <7,int>.

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14. Using the notation <value, type> give the value and type assigned to the objects y and z.

```
float x = 3.2;  
float y;  
float z;  
y = x++;  
z = x
```

Answer

Object y is assigned <3.2,float>. Object z is assigned <4.2,float>.

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15. What include directive must a program contain to use the `string` class?

Answer

```
#include <string>
```

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16. What is the name of the `string` library function for reading a string from a stream?

Answer

`getline()`

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17. Give the output of the following code fragment.

```
string Message = "Wallyball!";  
Message = "!!";  
cout << Message << endl;
```

Answer

!!

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18. Give the output of the following code fragment.

```
string Time = "1:42";  
string AM = "AM";  
cout << Time + AM << endl;
```

Answer

1:42AM

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19. Give the output of the following code fragment.

```
string Time = "11:15";  
Time += "PM";  
cout << Time << endl;
```

Answer

11:15PM

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20. Give the output of the following code fragment.

```
string s = "";  
cout << s.size() << endl;
```

Answer

0

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21. Give the output of the following code fragment.

```
string s = "Go Wahoos!";  
cout << s.size() << endl;
```

Answer

10

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22. Give the output of the following code fragment.

```
string s = "Beam Me Up Scotty";  
cout << s.substr(5, 2) << endl;
```

Answer

Me

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23. Give the output of the following code fragment.

```
string s = "The Picard Maneuver";  
cout << s.substr(4, s.size() - 1) << endl;
```

Answer

Picard Maneuver

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24. Give the output of the following code fragment.

```
string s = "Resistance is futile!";  
cout << s.find("is", 4) << endl;
```

Answer

11

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25. Give the output of the following code fragment.

```
string s = "You will be assimilated";  
int i = s.find("a", 0);  
cout << s.substr(i, s.size()) << endl;
```

Answer

assimilated

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26. Consider the following code fragment.

```
string Message;  
getline(cin, Message, ',');  
cout << "Message is " << Message << endl;
```

Give the output if the input is

Spock, you laughed, you laughed!

Answer

Message is Spock

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27. Write a program that reads a date in the format mm/dd/yy from the stream `cin` and writes the date to stream `cout` as follows:

```
Month: mm
Day: dd
Year: yy
```

Answer

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string Date;
    // Get the line containing the date
    getline(cin, Date, '\n' );

    // Use substr to crack the date. This code assumes
    // that each field is two characters long.
    string Month = Date.substr(0, 2);
    string Day = Date.substr(3, 2);
    string Year = Date.substr(6, 2);

    // Display it
    cout << "Month: " << Month << endl;
    cout << "Day: " << Day << endl;
    cout << "Year: " << Year << endl;

    return 0;
}
```

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28. Write a program that reads an assignment statement (e.g., `a = b + c;`) from the stream `cin` and outputs the left and right sides of the assignment statement to stream `cout`.

Answer

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string AssignmentStmt;
    // Get the line containing the date
    getline(cin, AssignmentStmt, '\n' );

    // Use find to find the assignment operator. No error checking
    // is done, the code assumes a properly formed assignment
    // statement.
    int i = AssignmentStmt.find("=", 0);
    string LeftHandSide = AssignmentStmt.substr(0, i - 1);
    string RightHandSide = AssignmentStmt.substr(i + 1,
        AssignmentStmt.size());

    // Display it
    cout << "Left hand side: " << LeftHandSide << endl;
    cout << "Right hand side: " << RightHandSide << endl;

    return 0;
}
```


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29. Write a C++ definition that creates a `SimpleWindow` object `Try`. The title bar should say "Good Job!" and the window should be 6 centimeters wide and 3 centimeters high.

Answer

```
SimpleWindow Try("Good Job!", 6.0, 3.0);
```

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30. Write a program that creates a `SimpleWindow` with the title “Nice Job!” and draws a blue square in the middle of the window. The window should be 5 centimeters wide and 6 centimeters high, and the rectangles should be 3 centimeters wide and 2 centimeters high.

Answer

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31. What is the message for obtaining the width of a `RectangleShape`?

Answer

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32. What is the message for obtaining the height of a `RectangleShape`?

Answer

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33. Describe the rectangle created and drawn by the following code fragment. How big is the rectangle and what color is it?

Answer

