Module 3 Chapter 6 Homework

Ashton Hellwig

October 10, 2018

Contents

Listings

1 Question 1

Determine the value of each of the following expressions:

A. `static_cast<char>(toupper('7'))`

B. `static_cast<char>(toupper('@'))`

C. `static_cast<char>(toupper('s'))`

D. `static_cast<char>(toupper('J'))`

E. `static_cast<char>(tolower('*'))`

F. `static_cast<char>(tolower(';'))`

G. `static_cast<char>(tolower('w'))`

H. `static_cast<char>(tolower('('))`

1.1 Solution

A. `static_cast<char>(toupper('7'))` = 7

B. `static_cast<char>(toupper('@'))` = @

C. `static_cast<char>(toupper('s'))` = S

D. `static_cast<char>(toupper('J'))` = J

E. `static_cast<char>(tolower('*'))` = *

F. `static_cast<char>(tolower(';'))` = ;

G. `static_cast<char>(tolower('w'))` = w

H. `static_cast<char>(tolower('('))` = (

2 Question 2

Consider the following function:

```
int mystery(int x, double y, char ch) {
  if (x == 0 && ch > 'A')
    return(static_cast<int>(pow(y, 2)) + static_cast<int> (ch));
  else if (x > 0)
    return(x + static_cast<int>(sqrt(y)) - static_cast<int> (ch));
  else
    return(2 * x + static_cast<int>(y) - static_cast<int> (ch));
}
```

What is the output of the following C++ statements?

A. `cout << mystery(0, 6.5, 'K') << endl;`

B. `cout << mystery(4, 16.0, '#') << endl;`

C. `cout << 2 * mystery(-11, 13.8, '8') << endl;`

2.1 Solution

a. `cout << mystery(0, 6.5, 'K') << endl;` = 117

b. `cout << mystery(4, 16.0, '#') << endl;` = -27

c. `cout << 2 * mystery(-11, 13.8, '8') << endl;` = -130

3 Question 3

Consider the following program:

```
1  #include <iostream>
2  using namespace std;
3
4  void func1();
5  void func2();
6
7  int main() {
8    int num;
9
10   cout << "Enter 1 or 2: ";
11   cin >> num;
12   cout << endl;
13
14   cout << "Take ";
15
16   if (num == 1)
17     func1();
18   else if (num == 2)
19     func2();
20   else
21     cout << "Invalid input. You must enter a 1 or 2" << endl;
22
23   return 0;
24 }
25
26 void func1() {
27   cout << "Programming I." <<endl;
28 }
29
30 void func2() {
31   cout << "Programming II." <<endl;
32 }
```

A. What is the output if the input is 1?

B. What is the output if the input is 2?

C. What is the output if the input is 3?

D. What is the output if the input is -1?

3.1 Solution

Input	Output
1	Take Programming I.
2	Take Programming II.
3	Take Invalid input. You must enter a 1 or 2
-1	Take Invalid input. You must enter a 1 or 2

4 Question 4

Consider the following program:

```
1  #include <cmath>
2  #include <iomanip>
3  #include <iostream>
4
5  using namespace std;
6
7  void traceMe(double x, double y);
8
9  int main() {
10   double one, two;
11
12   cout << "Enter two numbers: ";
13   cin >> one >> two;
14   cout << endl;
15
16   traceMe(one, two);
17   traceMe(two, one);
18   return 0;
19 }
20
21 void traceMe(double x, double y) {
22   double z;
23   if (x != 0)
24     z = sqrt(y) / x;
25   else {
26     cout << "Enter a nonzero number: ";
27     cin >> x;
28     cout << endl;
29     z = floor(pow(y, x));
30   }
31   cout << fixed << showpoint << setprecision(2);
32   cout << x << ", " << y << ", " << z << endl;
33 }
```

A. What is the output if the input is 3 625?

B. What is the output if the input is 24 1024?

C. What is the output if the input is 0 196?

4.1 Solution

Input	Output
3 625	3.00, 6.25, 8.33 625.00, 3.00, 0.00
24 1024	24.00, 1024.00, 1.33 1024.00, 24.00, 0.00
0 196	Enter a nonzero number: 0 196 0.00, 196.00, 1.00 196.00, 0.00, 0.00

5 Question 5

Consider the following function definition:

```
void defaultParam(int num1, int num2 = 7, double z = 2.5) {
  int num3;
  num1 = num1 + static_cast<int>(z);
  z = num2 + num1 * z;
  num3 = num2 - num1;
  cout << "num3 = " << num3 << endl;
}
```

What is the output of the following function calls?

A. `defaultParam(7);`

B. `defaultParam(8, 2);`

C. `defaultParam(0, 1, 7.5);`

D. `defaultParam(1, 2, 3.0);`

5.1 Solution

a. `defaultParam(7);`

```
num3 = -2
```

Listing 1: 5a Solution

b. `defaultParam(8, 2);`

```
num3 = -8
```

Listing 2: 5b Solution

c. `defaultParam(0, 1, 7.5);`

```
num3 = 6
```

Listing 3: 5c Solution

d. `defaultParam(1, 2, 3.0);`

```
num3 = -2
```

Listing 4: 5d Solution

A Question 1

```
#include <iostream>

using namespace std;

int main() {
  char a = static_cast<char>(toupper('7'));
  char b = static_cast<char>(toupper('@'));
  char c = static_cast<char>(toupper('s'));
  char d = static_cast<char>(toupper('J'));
  char e = static_cast<char>(tolower('*'));
  char f = static_cast<char>(tolower(';'));
  char g = static_cast<char>(tolower('w'));
  char h = static_cast<char>(tolower('('));

  cout << "a = " << a << '\n';
  cout << "b = " << b << '\n';
  cout << "c = " << c << '\n';
  cout << "d = " << d << '\n';
  cout << "e = " << e << '\n';
  cout << "f = " << f << '\n';
  cout << "g = " << g << '\n';
  cout << "h = " << h << endl;

  return 0;
}
```

Listing 5: Question 1 Implementation

Figure 1: Listing 5 Output