Practice midterm solutions

31 October 2016

1. The following program just uses variables. What does the program output?

```
#include <iostream>
using namespace std;
int main()
{
    int lisa = 5;
    double bart = 5 / 2.0;
    lisa = lisa + 1;
    int maggie = lisa / 2;
    maggie = maggie * 3;
    cout << lisa << ", " << bart << ", " << maggie << "\n";
    return 0;
}
```

Output:

```
6, 2.5, 9
```

2. The following program uses ASCII character arithmetic. What does the program output?

```
#include <iostream>
using namespace std;
int main()
{
    char hundred = 'C';
    char five = 'V';
    char marty = five + 2;
    char shelly = hundred + 6;
    cout << hundred << marty << marty << shelly << five << endl;
    return 0;
}
```

Output:

```
CXXIV
```

3. The following program uses conditions. What does the program output?

```
#include <iostream>
using namespace std;
int main()
{
    int bilbo = 9;
    int frodo = 3;
    if(bilbo % 2 == 0)
    {
        frodo *= 2;
        bilbo += 1;
    }
    else
    {
        bilbo = bilbo - 1;
        frodo *= 4;
    }
    cout << bilbo << ", " << frodo << "\n";
    return 0;
}
```

Output:

```
8, 12
```

4. Given `numPeople = 10`, `numCars = 2`, `userKey = 'q'`, **mark each of these expressions as true or false.**

a. true `numPeople >= 10`

b. false `(numPeople >= 10) && (numCars > 2)`

c. true `(numPeople >= 20) || (numCars > 1)`

d. false `!(numCars < 5)`

e. true `!(userKey == 'a')`

f. true `userKey != 'a'`

g. true `!((numPeople >= 10) && (numCars > 2))`

h. true `(userKey == 'x') || ((numPeople > 5) && (numCars > 1))`

5. Suppose that we have a `main` program containing this declaration:

```
string courseTitle;
```

Briefly explain the difference between these two operations:

```
cin >> courseTitle;          // (a)
getline(cin, courseTitle);   // (b)
```

The first one (a) reads only one word from the input, and leaves the 'cursor' just before the first space or newline. The second one (b) reads an entire line up to the user pressing enter.

6. The following program uses a switch. What does the program output?

```
#include <iostream>
using namespace std;
int main()
{
    int bill = 9;
    int ted = bill - 4;
    switch(ted)
    {
    case 3: cout << "ant ";
    case 2: cout << "bee "; break;
    case 5: cout << "cat ";
    case 4: cout << "dog "; break;
    default: cout << "eel ";
    }
    cout << "\n";
    return 0;
}
```

Output:

```
cat dog
```

7. The following program uses *nested* if/else statements. Given the values of `baz` and `tar` as inputs, what does the program output?

- `baz = 6; tar = 3;` Output: Belgium Chile France
- `baz = 3; tar = 6;` Output: Denmark France
- `baz = 6; tar = 9;` Output: Chile France
- `baz = 9; tar = 6;` Output: Austria Belgium Chile France
- `baz = 3; tar = 4;` Output: Denmark Egypt France

```
#include <iostream>
using namespace std;
int main()
{
    int baz, tar;
    cin >> baz >> tar; // Receives values as shown above
    if(baz > 4)
    {
        if(baz > 8)
        {
            cout << "Austria ";
        }
        if(tar < 8)
        {
            cout << "Belgium ";
        }
        cout << "Chile ";
    }
    else
    {
        cout << "Denmark ";
        if(tar < 6)
        {
            cout << "Egypt ";
        }
    }
    cout << "France\n";
    return 0;
}
```