UCLA Computer Science Department   TA: Kung-Hua Chang

Student Name and ID _____

CS 31, SPRING 2014, PRACTICE MIDTERM I.

Problem	Maximal Possible Points	Received
1	3	
2	5	
3	3	
4	3	
5	3	
6	3	
7	7	
8	5	
Total Score	32	

Problem #1: What is the output of the program below?

```
#include <iostream>
#include <string>
#include <cctype>
using namespace std;

int main()
{
        const string str = "There is an Apple!";
        int count=0;

        for(int i=0 ; i != str.size() ; i++)
                if( str[i] == 'a' && isalpha(str[i]) )
                        count++;

        cout << count << endl;
}
```

(1) 1
(2) 2
(3) 3
(4) 4
(5) 5
(6) No output. There is a Compilation Error.

Problem #2: Which of the following code segments produce the exact output as the sample program provided below? Suppose each choice uses the same header files (#include…).

```cpp
#include <iostream>
#include <string>
using namespace std;

int main()
{
        for(int i=0;i<2;i++) {
                for(int j=0;j<=i;j++)
                        cout << "*" ;
                cout << endl;
        }
}
```

(1)
```cpp
int main()
{
        for(int i = 2 ; i >= 1 ; i-- ) {
                for(int j = 0 ; j <= i ; j++ )
                        cout << "*" ;
                cout << endl;
        }
}
```

(2)
```cpp
int main()
{
        for(int i = 2 ; i >= 1 ; i-- ) {
                for(int j = 0 ; j < i ; j++ )
                        cout << "*" ;
                cout << endl;
        }
}
```

```cpp
( 3 )
int main()
{
        for(int i = 2 ; i >= 1 ; i-- ) {
                for(int j = 3 ; j > i ; j-- )
                        cout << "*" ;
                cout << endl;
        }
}


( 4 )
int main()
{
        for(int i = 2 ; i >= 1 ; i-- ) {
                for(int j = 2 ; j >= i ; j-- )
                        cout << "*" ;
                cout << endl;
        }
}


( 5 )
int main()
{
        for(int i = 2 ; i >= 1 ; i-- ) {
                for(int j = i+1 ; j >= i ; j-- )
                        cout << "*" ;
                cout << endl;
        }
}
( 6 )
int main()
{
        for(int i = 5 ; i >= 4 ; i-- ) {
                for(int j = 5 ; j >= i ; j-- )
                        cout << "*" ;
                cout << endl;
        }
}
```

Problem #3: What is the output of the program below?

```cpp
#include <iostream>
#include <string>
using namespace std;

int main()
{
        string str = "abcdefga";
        int value = 0;

        for(int i = 0 ; i != str.size() ; i++ ) {
                for(int j = i + 1 ; j != str.size() ; j++ ) {
                        if( str[ i ] == str[ j ] ) {
                                value = j - i;
                        }
                }
        }

        cout << value << endl;
}
```

(1) 1
(2) 2
(3) 3
(4) 4
(5) 5
(6) 6
(7) 7
(8) 8
(9) 9
(10) 10
(11) 11
(12) 12
(13) No output. There is a Compilation Error.

Problem #4: What is the output of the program below?

```cpp
#include <iostream>
#include <string>
using namespace std;

int main()
{
        int i = 0,value = 0;

        for( i = 0 ; i < 5 ; i++ ){
                switch( i ) {
                case 1: value = i + 1;
                case 2: value = value - 1;
                case 3: value = value + 1;
                case 4: value = value + 2; break;
                case 5: value = value - 1;
                default: value = value + 1;
                }
        }

        cout << value << endl;
}
```

(1) 1
(2) 2
(3) 3
(4) 4
(5) 5
(6) 6
(7) 7
(8) 8
(9) 9
(10) 10
(11) 11
(12) 12
(13) 13
(14) 14
(15) No output. There is Compilation Error

Problem #5: What is the output of the program below?

```cpp
#include <iostream>
#include <string>
using namespace std;

int main()
{
        int i = 0;

        do {
                for(int j = i ; j >= 0 ; j-- )
                        cout << "*" ;
                cout << endl;
                i++;
        }while(i<4);
}
```

(1)
```
*
**
***
****
```
(2)
```
*
**
***
```
(3)
```
***
**
*
```
(4)
```
****
***
**
*
```

Problem #6: What is the output of the program below?

```cpp
#include <iostream>
#include <string>
using namespace std;

int main()
{
        string exp = "-3+3+555+99999";

        int mult = 1;
        int offs = 0;
        for(int i=0;i != exp.size() ; i += 2) {
                if( exp[ i ] == '-' )
                        mult = i+5;
                else if( exp[ i ] == '+' )
                        mult = i+8;
                else
                        offs = 1;
        }
        cout << exp[offs] << exp[mult % exp.size() ] << endl;
}
```

(1) 5+
(2) 99
(3) -3
(4) 3+
(5) 33
(6) 55
(7) 5+
(8) +5
(9) 35
(10) 53
(11) 59
(12) 39
(13) 93
(14) -9
(15) 9+

Problem #7: Please use switch-case to write a program below to output a
student's grade based on the following conditions:
If a student's grade is from 90 to 100, then it's A (just cout << "A" << endl;)
If a student's grade is less than 90, but greater than or equal to 80, then it's B.
If a student's grade is less than 80, but greater than or equal to 70, then it's C.
If a student's grade is less than 70, but greater than or equal to 60, then it's D.
Otherwise, it's F.
If you do not use switch-case to write your program, you'll get zero points.
You can only use 1 extra variable. Failure to comply gets zero points.

```cpp
#include <iostream>
using namespace std;

int main() {
    int score = 0;

    cout << "Please enter the student's score:";
    cin >> score;




}
```

Problem #8: Please write a do-while loop to find the first lower case character in a given string. If there is no lower case letter, the program outputs "No lowercase character". If there is a lower case character, output the first lower case character. If your program gets stuck in an infinite loop, you'll get zero points.

```cpp
#include <iostream>
#include <cctype>
#include <string>
using namespace std;

int main() {
        int i;

        string str;

        cin >> str;




        if (                                            )
                cout << "No lowercase character" << endl;
        else
                cout << str[i] << endl;
}
```