

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? (1)

```
#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...). (3)(4)(6)

```
#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)

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

(2)

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

(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? (7)

```
#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? (11)

```
#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? (1)

```
#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? (4)

```
#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.

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

```
int main() {
    int score = 0;

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

```
    int choice = score/10;
```

```
    switch(choice) {
        case 10:
        case 9:
            cout << "A" << endl;
            break;
        case 8:
            cout << "B" << endl;
            break;
        case 7:
            cout << "C" << endl;
            break;
        case 6:
            cout << "D" << endl;
            break;
        default:
            cout << "F" << endl;
```

```
    }
}
```

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.

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

int main() {
    int i;

    string str;

    cin >> str;

    i = -1;

    do {
        i++;
    } while( i != str.size() && !islower(str[i]) );

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