CSCE240 Spring 2017 SI: Exam Review 1 **Feb 1, 2017**

Write the output of the code.

1	`for (int i = 0; i < 5; i++) {`
	`  for (int j = 0; j < i; j++) {`
	`  cout << "*";`
	`  }`
	`  cout << endl;`
	`}`
		*
		**
		***
		****

2	`for (int i = 0, j = 10; i < j; i++, j--) {`
	`  cout << i << " " << j << endl;`
	`}`
		0 10
		1 9
		2 8
		3 7
		4 6

3	`int i = 0;`
	`int j = 7;`
	`while (j != 0) {`
	`  for (int k = j - i; k >= 0; k--)`
	`{`
	`  cout << "*";`
	`  }`
	`  cout << endl;`
	`  i++;`
	`  j--;`
	`}`
		********
		******
		****
		**

4	`int a[] = {2,5,4,3,1,0,6,2};`
	`int a_size = 8;`
	`int b = 0;`
	`for (int i = 0; i < a_size; i++) {`
	`  for (int j = i; j > 0; j--) {`
	`  if (a[j] < a[j - 1]) {`
	`  b = a[j];`
	`  a[j] = a[j - 1];`
	`  a[j - 1] = b;`
	`  }`
	`  }`
	`}`
	`b = a_size - 1;`
	`do {`
	`  cout << a[b] << " ";`
	`} while (b-- > 0);`
	`cout << endl;`
		6 5 4 3 2 2 1 0

5	`int a[5][5];`
	`int a_width = 5;`
	`int a_height = 5;`
	`for (int i = 0; i < a_width; i++) {`
	`  for (int j = 0; j < a_height; j++) {`
	`  a[i][j] = (i * j) + 1;`
	`  }`
	`}`
	`for (int i = 0; i < a_width; i++) {`
	`  for (int j = 0; j < a_height; j++) {`
	`  cout << a[i][j] << " ";`
		1 1 1 1 1
		1 2 3 4 5
		1 3 5 7 9
		1 4 7 10 13
		1 5 9 13 17

	} cout << endl; }	

6	int * a, * b;
	int N = 5;
	a = new int[N];
	b = a;
	for (int i = 0; i < N; i++) {
	a[i] = i * N;
	}
	cout << *++a << endl;
	delete [] b;
		5

7	int a[] = {0,1,2,3,4,5,6,7,8,9};
	int a_size = 10;
	int * p;
	int b = a_size - 1;
	p = a;
	while (b >= 0) {
	cout << p[b] << " ";
	b--;
	}
	cout << endl;
		9 8 7 6 5 4 3 2 1 0

8	int a[] = {0,1,2,3,6,5,4,9,7};
	int b = 1;
	cout << (b += 30) << endl;//31
	cout << (++b -= 21) << endl;//10
	cout << (--b %= 4) << endl;
	
	cout << a[b] << endl;
		31
		11
		2
		2

9	int n = 15;
	cout << (n++) << endl;
	cout << (++n) << endl;
	cout << "(n++)" << endl;
		15
		17
		(n++)

10	char str1[] = "The Cake Is a Lie";
	char str2[] = "Wubba Lubba Dub Dub";
	char str3[] =
	{'s','t','a','y','i','n','g','\0','a
	','l','i','v','e','\0'};
	char * cat;
	int a = 0;
	int b = 0;
	int c = 0;
	int d = 0;
	cat = new char[strlen(str1) +
	strlen(str2) + strlen(str3)];
	cout << str1 << endl << str2 << endl
	<< str3 << endl;
	while (str1[a] != '\0' || str2[b] !=
	'\0' || str3[c] != '\0') {
	if (str1[a] != '\0') {
	cat[d] = str1[a];
	d++;
	a++;
	}
	if (str2[b] != '\0') {
	cat[d] = str2[b];
		The Cake Is a Lie
		Wubba Lubba Dub Dub
		staying
		TWshuteba byCaia nkLgeu bIbsa aD uLbi eDub

	d++;
	b++;
	}
	if (str3[c] != '\0') {
	cat[d] = str3[c];
	d++;
	c++;
	}
	}
	for (int i = 0; i < strlen(cat);
	i++) {
	cout << cat[i];
	}
	cout << endl;	

11	int x = 2;
	switch (x) {
	case 1:
	cout << "Case " << 1 <<
	endl;
	case 2:
	cout << "Case " << 2 <<
	endl;
	case 3:
	cout << "Case " << 3 <<
	endl;
	break;
	case 4:
	cout << "Case " << 4 <<
	endl;
	default:
	cout << "Default Case" <<
	endl;
	}
		Case 2
		Case 3

12	int a = 8;
	int b = 4;
	int c;
	if ((c = b) == 4) {
	cout << true << endl;
	c = a / 2;
	}
	if (c++ > ++b) {
	cout << "yes" << endl;
	} else {
	cout << c << endl;
	}
	while (++b < 10) {
	cout << b << endl;
	if (b > a) break;
	}
		1
		5
		6
		7
		8
		9

13	char a[] = "Dan the dude";
	char b[] = "Thank You MArio, but our
	princess is in another castle";
	char c[] = {'3','l','1','t','3'};
	char f[strlen(a)];
	char * d = a;
	char * e = f;
		Dan the dude
		0
		T3hla1ntk3

	int i = 0;
	while ((*e = *d) != '\0') {
	d++;
	e++;
	}
	cout << f << endl;
	d = new char[strlen(a)];
	strcpy(a,d);
	cout << strlen(d) << endl;
	while (b[i] != '\0' && c[i] != '\0')
	{
	cout << b[i] << c[i];
	i++;
	}
	cout << endl;	

Find the Errors in the Code and describe what the program behavior would be (such as a Compiler Error, Array out of bounds, etc.)

1	int a[] = new int[10];
	int sum = 0;
	for (int i = 0; i < 10; i++) {
	a[i] = i + sum;
	sum = a[i];
	}
	cout << sum << endl;
		Incorrect initialization

2	char a[] = "Its-a-me Mario!"; char * b; strcpy(b, a); cout << b << endl;	Copying to uninitialized array

3	int a[5];
	for (int i = 15; i >= 0; i--) {
	a[i - 1] = i;
	}
	cout << a[6] << endl;
		Out of bounds

4	int a = 1;
	switch (a) {
	case a > 0:
	cout << "A is Greater than 0" << endl;
	case a == 0:
	cout << "A is Zero" << endl;
	case a < 0:
	cout << "A is Less than Zero" << endl;
	}
		Missing default, and has expression in case statement

5	char a[] = {'T','a','n','g','e','r','i','n','e'};
	char *b = new char[strlen(a)];
	while ((*b = *a) != '\0') {
	b++;
	a++;
	}
	cout << b << endl;
		CString has no \0

6	`int a = -1337;`
	`if (a = 1) {`
	`  cout << "A is 1" << endl;`
	`}`
		Assigns 1 to a. Does compile and work. Logic Error

7	`float a = 9222524.024659756321457753215465135462168432;`
	`float b = 9222524.024659756321457753215465135462168432;`
	`if (a == b) {`
	`  cout << "A and B are the same" << endl;`
	`}`
		Floats are inaccurate. Bad comparison. Use abs(a-b) < 1e-6

8	`int i = 0;` `cout << i++ << " " << ++i << endl;`	Undefined behaviour
9	`const int hello = 42;` `cout << hello++ << endl;`	Modifying constant

10	`int a[10];`
	`int * b;`
	`for (int i = 0; i < 10; i++) {`
	`  b[i] = a[i];`
	`}`
		Pointer b not initialized

11	`int a[] = {0,1,2,3};`
	`int b[4];`
	`b = a;`
	`cout << b << endl;`
		Cannot copy array by doing this

12	`int a[10];`
	`int *b = new int[10];`
	`for (int i = 0; i < 10; i++) {`
	`  b[i] = a[i];`
	`  cout << b[i] << endl;`
	`}`
		Didn't delete array b

13	`int a[3];`
	`int * b = new int [3];`
	`for (int i = 0; i++ < 3;) {`
	`  b[i] = a[i];`
	`}`
	`delete b[];`
	`cout << b[2] << endl;`
		Wrong delete syntax, and tried to access b after it was deleted

14	`int * a = new int[10];`
	`for (int i = 0; i < 10; i++) {`
	`  a[i] = i * 3;`
	`  cout << a[i] << endl;`
	`}`
	`delete a;`
		Deletes only the first index of the array a.

You can find all of this code on the SI github:
https://github.com/Nesdood007/CSCE240S2017/tree/master/Worksheets/ExamReview1

To run this on the linux lab computers, open a terminal or SSH in and type

$ git clone https://github.com/Nesdood007/CSCE240S2017/

The repository should be cloned to ~/git/CSCE240S2017/

Given CStrings a and b, finish the function to concatenate the two strings. Make sure to return you concatenated CString!

```
char* concatenate (const char * a, const char * b) {
    char * c = new char[strlen(a) + strlen(b)];
    for (int i = 0; i < strlen(a) + strlen(b); i++) {
        if (i < strlen(a)) {
            c[i] = a[i];
        } else {
            c[i] = b[i - strlen(a)];
        }
    }
    return c;
```

Write a program that prints, given some user input n, the following pattern

1. There are n lines in total
2. Every other line starting from the first line has the string “()” n times
3. Every other line starting from the second line has “(“ n times followed by “)” n times

```
//Example if n = 4:
//()()()()
//(((())))
//()()()()
//(((())))

    int n = 0;
    cin >> n;
    for (int i = 0; i < n; i++) {
        if (i % 2 == 0) {
            for (int j = 0; j < n; j++) {
                cout << "()";
            }
        } else {
            for (int j = 0; j < n * 2; j++) {
                if (j - n < 0) {
                    cout << "(";
                } else {
                    cout << ")";
                }
            }
        }
        cout << endl;
    }
```