

Final Exam is Monday April 30, 2018 at 8:00am

1. If i, j, and k are all of type int and i = 0, j = 2, and k = -8, mark whether each of the following logical expressions is true or false.

A) (i==0) || (k < 7) _____ B) !((j<5) && (k<9)) _____

2. If i, j, and k are all of type int and i = 4 and j = -2, what is the value of i, j, and k *after* execution of the following line of code?

```
k = i++ + --j;  
i = _____ j = _____ k = _____
```

3. How many lines of print do each of the following produce? Assume all variables have been declared and are of type int.

A) <pre>for(i=3;i<10;i+=2) { Console.WriteLine("Jello"); for(j=100;j>-1;j--) { Console.WriteLine("Hello"); } }</pre> Lines of Print _____	B) <pre>i = -3; while(i < 8) { Console.WriteLine("Hello"); for(j=0;j<30;j+=2) Console.WriteLine("Mom"); i+=3; }</pre> Lines of Print _____
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4. The following code produces a compiler error. What is the error and show how to correct it without changing the variable declarations.

```
int i = 1;  
double j = 4.23;  
i = j;  
Console.WriteLine(i);
```

5. What is the difference between the terms ref and out with respect to passing arguments to methods in C#?

6. Give a brief example of "method overloading"?

7. Write a short sequence of code in C# which will produce 1000 random integers which have value 3, 4, 5, or 6. Your sequence should print the total number of 3's in the integer list.

8. The following sequence creates a 2-dimensional array of ints and fills it with data. In the space below fill in the correct values that will be in the array after the program runs.

```

int[,] a = {{3,2,1}, {4,5,1}};
int r, c;
for(r=0;r<2;r++)
    {for(c=0;c<3;c++)
        {if(a[r,c] == 1)
            a[r,c] = 0;
            else
                a[r,c] = 1 + r*c
        }
    }
}

```


9. The following statement creates a 2 dimensional array and initializes its values. Write a short sequence to find and print the maximum and minimum values in the array.

```
int a[,] = {{9, 4, 3, 2}, {4, 23, 32, 45}, {6, 31, 14, 26}};
```

10. The following statement creates a 1-dimensional array and initializes its values. Write a complete method named *FindSum(a, out n)* where a is the array and n is an int. The method finds the sum of the elements of the array and returns the sum in the parameter n.

```
int[] a = {0, 1, 2, 3, 5, 7, 9, 0, 11};
```

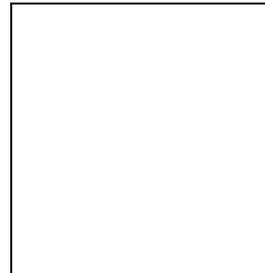
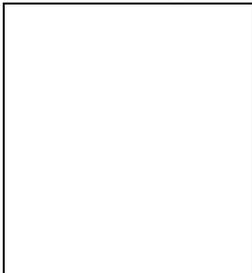
11. A portion of a program is shown below which gives two methods in a windows application. The method btnStart_Click runs when the user clicks on a button in the form. The method ConfuseMe runs when it is activated by btnStart_Click. Complete the memory map shown for the two methods and show what is printed in the two message boxes that are used in the methods.

```
private void btnStart_Click(object sender, System.EventArgs e)
{
    string str;
    int a = 1, b = 2, c;
    ConfuseMe(ref a, b, out c);
    str = a.ToString();
    str += "\n" + b.ToString();
    str += "\n" + c.ToString();
    MessageBox.Show(str);
}
//
private void ConfuseMe(ref int a, int b, out int c)
{
    string str;
    a = 4;
    b = 7;
    c = 11;
    str = a.ToString();
    str += "\n" + b.ToString();
    str += "\n" + c.ToString();
    MessageBox.Show(str);
}
```

Printed Output:

First Message Box

Second Message Box



ConfuseMe	btnStart_Click	Memory

12. Write a function to accept a single sentence as an argument. Your function should print the sentence with the letters reversed. For example, if the sentence is:

Hello Mom, bake a cake.

your program should print:

.ekac a ekab ,moM olleH

13. Write the definition for the AProperty for the class below.

```
using System;
namespace MyClass
{
    public class MyClass : Object
    {
        private double a;
        public MyClass()
        {
            AProperty = 0.0;
        }
        public X(double u, double v)
        {
            AProperty = u;
        }
        //
        ...
    }
}
```

14. Write a C# program to prompt the user for an input sentence. Replace only the first occurrence of the letter sequence "as" in this sequence with the sequence "bt". Print the sequence to the console.

15. Suppose you have a listbox named `lsbMyListBox`. Show how you could add the following words to the list box:

Hello
My
Name
Is
Not
Mud.

16. Given a text box named `txtMyTextBox`. Write a try/catch sequence which does input from the text box and catches all errors in the process. When any type of error occurs your program should print the word "Error" in a message box.

17. The following method does a Bubble sort on an `int` parameter named `sortVector`. Line numbers have been added to the left for reference purposes. Modify the program so that it sorts a string vector.

```
1 private void Sort(int[] sortVector)
2     {bool sorted = false;
3       int i, j, k, iTmp;
4       while(sorted == false)
5         {sorted = true;
6           for(i=0;i<sortVector.length - 1;i++)
7             {j = sortVector[i];
8               k = sortVector[i+1];
9               if(j > k)
10                {iTmp = sortVector[i];
11                  sortVector[i] = sortVector[i+1];
12                    sortVector[i+1] = iTmp;
13                    sorted = false;
14                }
15            }
16        }
17    }
```

18. In class we looked at the implementation of the game of Life using the Cell class below.

A) Show how to create a two-dimensional array of type Cell with dimensions Xmax and Ymax.

B) Show how to instantiate each member of the array.

```
public class Cell
{private bool alive;
//
public Cell()
{alive = false;
}
//
public Cell(bool a)
{alive = a;
}
//
public bool Alive
{get
{return alive;
}
set
{alive = value;
}
}
}
```