Problem (1) [10 points] For both parts, show the outputs of the following loops:

(a)
```cpp
int x=1;
for(int i=1 ;i < 100; i*=2)
{
    cout << i%x << " ";
    x++;
}
```

(b)
```cpp
int z = 4;
for(int i=0; i <= z; i++)
{
    for(int j=0; j <= z; j++)
    {
        if(i == j || i == z-j)
        {
            cout << "x";
        }
        else
        {
            cout << " ";
        }
    }
    cout << endl;
}
```
**Problem (2)** [10 points] Ask the user how many times they want to loop (assume at least once), read in the requested amount of numbers (no restrictions on what they can enter), then display the largest number that they entered (i.e. the maximum).

**Problem (3)** [10 points] Find 3 possible places for errors in the following code fragment. Explain specifically what causes the error and whether it is a syntax, runtime or logic error. You may assume all includes are done properly, the code is inside a valid function, it is using namespace std and there are no manually declared global variables.

```cpp
int 3number = 3;
cout << "Enter " << 3number*2 << " numbers: " << endl;
for(int i=0; i < 3number*2; i++) {
    double one, two, max;
cin >> one >> two;
if(one > two) {
    max = one;
}
else {
    max = two;
}
}
cout << "The largest number was " << max << endl;
```
Problem (4) [10 points] Rewrite this switch as logically equivalent set of if/else statements.

```cpp
char c;
 cin >> c;

 switch(c)
 {
 case 'a':
 case 'b':
      cout << "1";
      break;
 case 'c':
      cout << "2";
      // yes, no break
 case 'd':
      cout << "3";
      break;
 default:
      cout << "4";
      break;
 }
```

Problem (5) [10 points] For each part, the conditions of the if-statements are not given. Without knowing the actual conditions, say give both the maximum and minimum amount of code blocks that can be executed.

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Problem (6) [10 points] Fill in the blanks (i.e. _______ ) with the most appropriate pieces of code. The code should be fully functional after you fill in. You may only fill in the blanks, not change the existing code. All blanks must be less than 30 characters (no writing tons of code in them!).

```cpp
--------------
cout << "Odd numbers between 0 and " << m << " are: ";
--------------
{
    if(i%2 == 0)
    {

        --------------
        cout << i << " ";
    }
}
```

Problem (7) [10 points] Assume there exists a variable size with an integer value. Print a “T” rotated \( \frac{\pi}{2} \) radians (90 degrees) to the left as shown in the example output. You must use size to determine how many X’s to print and not always 5 as shown in the output (you may assume size is odd).

Sample output for size=5:

```
X
X
X X X X X
X
X
```