Objectives: Dealing with nulls and missing objects
How 2D arrays work. Processing ragged arrays.
Notes: MP2 Regraded tonight (99) & Mon (98)
MP3 due Mon 8pm. DYB Sun 6pm @ SC0224

#0 What do the following do? Fix any syntax errors you notice.

```
new int[6];
new int[6] {1, 2, 3, 4, 5, 6};
int[] a = {1, 3, 5, 7, 9, 11};
int[] b = null;
b = a;
char[100] myvariable = new char[100];
int len = myvariable.length();
```

#1 What will the following code print?

```
int[][] data = new int[10][20];
TextIO.putln(data.length);

int[] myrow = data[3];
TextIO.putln(myrow.length);
TextIO.putln(data[3].length);
TextIO.putln(myrow[5]);
```

myrow[5] is equivalent to data[_____][_____]

#2 CSI Phone records. (Parallel arrays)

Print out all entries where a phone call originated from Madison, WI. Some entries may be *null* if the from or to numbers are unknown.

```
String from[] = new String[] {"608-123-3311", "221-254-8622", ...};
String to[] = new String [] {"217-555-6200", "217-512-6200", ... };
int[] duration = new int[] {1, 25, 8, 23, ... };
```

#3 Using 2D arrays to represent an image.

Create a picture of the JVMs memory and use memory pointers to explain why the following code swaps two rows.

```
int[][] pixels;

pixels =  new int[480 /*row or 'y' coordinate*/][640 /* column or 'x'];

//initialize pixel array : Odd rows are black. Even rows are white

for (int y = 0; y < 480; y ++)
  for (int x = 0; x < 640; x ++)
    if (y % 2 == 0) pixels[___][____] = 0xffffff;

//0xfffff = all white (red=255, green=255, blue=255)

int[] temp = pixels[10];
pixels[10] = pixels[11];
pixels[11] = temp;
```

#4 Nested loops

```
int[] a = {7, 5, 2, …};
int[] b = {9, 3, 8, 2, …);
```

Print all of the numbers in unsorted array b that are **not** in unsorted array a.

#5 Merge (Turings Craft)

Complete the following code to merge two **sorted** integer arrays together into a single output array

.

```
public static int[] merge(int[] A, int[] B) {
        int done = 0;
        int countA = 0;
        int countB = 0;

        int[] result = new int[_____];

        while ((countA < A.length) ____  _____){

         if (_____])
           result[done ++] = A[countA ++];
         else
           result[_____] = B[ _____];
        }

        while (countA < A.length)
          result[done ++] = A[countA ++];
```

#6 What will the following print exactly?

```
 for (int x = 3; x <= 12; x = x * 2) {
   for (int y = x;  y > 0; y --) TextIO.put("x");
   TextIO.putln();
 }
```

#7 Complete the following code to print out a random love letter. Choose a random phrase from each string array.

```
public static void main(String[] args) {
       String [][] letter = {
            {"Hi", "Dear", "Dearest"},
            {"Mike,","Jenny,","sugar,","sweetheart,"},
            {"\n"},
            {"I can no longer","I want to","I need to"},
            {"think","swim","break up","sing country music"},
            {"for you.","with you.","about you."},
            {"\n"},
            {"Bye,","Your loving friend,"},
            {"\n"},
            {"Jenny","Jim"}
       };
```