ET-575 – Arrays I - Homework

1. Implement an empty integer array of capacity 5.

   a) Use a loop to input values from the console into the array.
   b) Use a loop to determine the smallest element in the array.
   c) Use a loop to determine the largest element in the array.
   d) Use a loop to output the array.
   e) Output the smallest and largest elements.

Example Output (input in **bold** *italics*)

[0] = ***4***
[1] = ***24***
[2] = ***123***
[3] = ***54***
[4] = ***3***

Array: 4 24 123 54 3
Max: 123
Min: 3

2. Implement an array of the English alphabet (26 characters).

   a) Use a loop and casting to generate the array.
   b) Output the array.
   c) Create a swap function for swapping character variables.
   d) Use a loop and the swap function to reverse all array elements.
   e) Output the updated array.

   Hint: Set a variable for the first and last indices. Swap those values. Gradually move the first/last pointers to the middle of the array, swapping as you go. When the middle is reached, the array will be reversed.

   Example Output (input in **bold** *italics*)

   Original: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
   Reversed: Z Y X W V U T S R Q P O N M L K J I H G F E D C B A

3. Store the following 20x7 image into a two-dimensional character array.
   Use a loop to output the array to the console.

Example Output (input in **bold** *italics*)

```
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```

4. Implement a 4x4 two-dimensional array of integers.

   a) Use a nested loop to populate the array with values 10 to 25 inclusive.
   b) Use a nested loop to output the array as a grid.
   c) Use a single loop to output all elements in the second row.
   d) Use a single loop to output all elements in the third column.
   e) Use a single loop to output all elements in the first diagonal (r==c).
   f) Use a single loop to output all elements in the opposing diagonal.

   Hint: Recall that loops can have multiple initializations, conditions and
   increment changes such as:

   ```
   for(int i=5, j=2; i>=0 && j<10; i--, j++) { loop code; }
   ```

Example Output (input in **bold** *italics*)

```
10 11 12 13
14 15 16 17
18 19 20 21
22 23 24 25

Row 2:      14 15 16 17
Col 3:      12 16 20 24
Diagonal 1: 10 15 20 25
Diagonal 2: 13 16 19 22
```