Exercises: Arrays

1. Write a program that reads values from the user into each element of a real array.

2. Write a program that reads values into a real array, and then finds the sum of all the elements, the product of all the elements, and the average of all the elements.

3. Write a program that reads values into a real array, and then finds the minimum, maximum, and median out of all the elements.

4. Write a program that reads values into a real array, and then reads a real number, and determines whether the number is contained in the array. If it is, the program should also display the index (indices) of the matching element(s).

5. Write a program that reads values into a real array, and then reverses the order of the array's elements, by swapping the first with the last elements, etc.

6. Write a program that reads values into a real array, and then reads an integer *n*. The program should then rotate the elements rightward by a distance of *n* elements (if *n* is negative, the elements should rotate leftward).
   For example, an array { 1, 2, 3, 4, 5, 6 }, rotated by *n* = 4, will become:
   { 3, 4, 5, 6, 1, 2 }

7. Write a program that reads values into a real array, and then sorts them from lowest to highest. Use whichever sorting method you prefer.

8. Write a program that reads values into a dynamic real array, and removes any duplicates, reducing the size of the array as necessary.

9. Write a program that reads values into a dynamic real array, and then reads a real number *n* and an integer *i*. The program should insert *n* at index *i*.

10. Write a program that encrypts the data contained in an array. The program should read values into an integer array with 4 elements, and then apply the encryption in the following way:
    First, replace each of the digits in the integer by ((this digit + 7) modulo 10).
    Then, exchange the first digit with the third digit, and exchange the second digit with the fourth. Finally, display the encrypted array.

11. Write a program that decrypts an array encrypted by the program in (10).