*CSE 102*

**ARRAYS**

1. Write a function which takes a Boolean array *A* and returns another Boolean array *B* such that
   1. *A* and *B* have the same length.
   2. Number of true’s in *A* is equal to the number of true’s in *B*.
   3. True’s are on the left of false’s in *B.*

e.g.

func([true, false, false, true]) = [true, true, false, false]

1. Write a function which takes a string and returns the corresponding char array. (Strings and char arrays are not the same, consider why.)

e.g.

convert(“abc”) = [‘a’, ‘b’, ‘c’]

1. Write a function which takes a string array and returns true iff the strings are sorted alphabetically (from a to z).
2. Write a function which rotates an integer array by a given amount. Rotation is the following operation:

[1, 2, 3, 4, 5, 6] 🡪 rotate by +1 🡪 [6, 1, 2, 3, 4, 5]

[1, 2, 3, 4, 5, 6] 🡪 rotate by +3 🡪 [4, 5, 6, 1, 2, 3]

[1, 2, 3, 4, 5, 6] 🡪 rotate by -2 🡪 [3, 4, 5, 6, 1, 2]

1. Write a function which takes two arguments: a string with unique characters that we call *allowed* and a string array that we call *words.* Your function should return the number of strings in *words* that are consistent with the string *allowed.* A string *s* is consistent with *allowed* if all characters of *s* appears somewhere in *allowed.*

e.g.

countConsistent([“abba”, “aa”, “ba”], “ab”) = 3

countConsistent([“abba”, “aac”, “bae”], “abe”) = 2

**Challenging Stuff**

1. Write a function which takes an integer *n* and returns all prime numbers less than or equal to *n* as an integer array. (Since you don’t know the size of the array in advance, you can use an upper bound on the array size (*n*) and at the end copy the non-zero content into a smaller array.)

e.g.

primes(10) = [2, 3, 5, 7]

primes(3) = [2, 3]

1. Write a function which takes a positive integer and returns its remainder representation as an integer array. Let pi denote the ith prime number. Remainder representation of a positive integer *n* is the ordered list [r1, r2, .. rk] where n % pi = ri  for all *i* and *k* is the smallest integer such that p1 p2 p3 … pk >= n.

(Use the solution of the previous question for primes)

**BONUS**: Prove that every positive integer has a unique remainder representation.