CSE 143x Section #5
Cheat Sheet

Declaring and using arrays (7.1)
```
type[] name = new type[length];
name[index] = value;
```

Example:
```
int[] numbers = new int[10];
numbers[3] = 42;
numbers[7] = 23;
```

index	0	1	2	3	4	5	6	7	8	9
value	0	0	0	42	0	0	0	23	0	0

```
type[] name = {value, value, ..., value};
```

Example:
```
int[] numbers2 = {18, 7, 1, -3, 29, 4};
```

index	0	1	2	3	4	5
value	18	7	1	-3	29	4

Array as parameter (7.1)
```
public static void name(type[] name) {
```

Example:
```
public static double average(int[] nums) {
    int sum = 0;
    for (int i = 0; i < nums.length; i++) {
        sum += numbers[i];
    }
    return (double) sum / nums.length;
}
```

Array as return value (7.1)
```
public static type[] name(parameters) {
```

Example:
```
public static int[] countDigits(int n) {
    int[] counts = new int[10];
    while (n > 0) {
        counts[n % 10]++;
        n = n / 10;
    }
    return counts;
}
```

Array traversals (7.2)
```
for (int i = 0; i < array.length; i++) {
    do something with array[i];
    ...
}
```
Example:
```
int[] counts = {10, 30, 20, 4};
int sum = 0;
for (int i = 0; i < counts.length; i++) {
    sum += counts[i];
}
```

String traversals (4.4)
```
for (int i = 0; i < string.length(); i++) {
    do something with string.charAt(i);
    ...
}
```
Example:
```
String phrase = "the quick brown fox";
int capitalLetters = 0;
for (int i = 0; i < phrase.length(); i++) {
    char letter = phrase.charAt(i);
    if (letter >= 'A' && letter <= 'Z') {
        capitalLetters++;
    }
}
```

Methods of the `Arrays` class

Method	Description
`Arrays.fill(array, value)`	sets every element in the array to the given value
`Arrays.sort(array)`	arranges the elements in the array into ascending order
`Arrays.toString(array)`	returns a `String` for the array, such as: `"[10, 30, 17]"`

```
System.out.println(Arrays.toString(numbers));  // [0, 0, 0, 42, 0, 0, 0, 23, 0, 0]
```

Common Array Errors
- `ArrayIndexOutOfBoundsException`
  You tried to access an element with an invalid index (a negative index, or ≥ the length of the array).