# CSE 142 Section Handout #7
# 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

| | |
|---|---|
| `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).