

## 1 C Introduction

C is syntactically very similar to Java, but there are a few key differences of which to be wary:

- C is function oriented, not object oriented, so no objects for you.
- C does not automatically handle memory for you.
  - In the case of stack memory (things allocated in the “usual” way), a datum is garbage immediately after the function in which it was defined returns.
  - In the case of heap memory (things allocated with `malloc` and friends), data is freed only when the programmer explicitly frees it.
  - In any case, allocated memory always holds garbage until it is initialized.
- C uses pointers explicitly. `*p` tells us to use the value that `p` points to, rather than the value of `p`, and `&x` gives the address of `x` rather than the value of `x`.

There are other differences of which you should be aware, but this should be enough for you to get your feet wet.

## 2 Uncommented Code? Yuck!

The following functions work correctly (note: this does not mean intelligently), but have no comments. Document the code to prevent it from causing further confusion.

```
1. /*
   *
   */
int foo(int *arr, size_t n) {
    return n ? arr[0] + foo(arr + 1, n - 1) : 0;
}
```

```
2. /*
   *
   */
int bar(int *arr, size_t n) {
    int sum = 0, i;

    for (i = n; i > 0; i--) {
        sum += !arr[i - 1];
    }

    return ~sum + 1;
}
```

```
3. /*
   *
   */
void baz(int x, int y) {
    x = x ^ y;
    y = x ^ y;
    x = x ^ y;
}
```

