Homework 2

Problem 2

A. in order of increasing run times (shortest to longest),

O(0) -> O(5) -> O(logN) -> O(N) -> O(N log N) -> O(2/N) -> O(N^0.5) -> O(N^1.5) -> O(N^2) = O(N*M) -> O(N^4) -> O(2^N) -> O(infinity)

B.

i.

```
sum = 0;
for (i = 0; i < n; i++) {
    sum++;
}
```

1 Loop = O(N)

ii.

```
sum = 0;
for (i = 0; i < n; i++) {
    for (j = 0; j < n; j++) {
        sum++;
    }
}
```

2 loops nested = O(N^2)

iii.

```
sum = 0;
for (i = 0; i < n; i++) {
    for (j = 0; j < i; j++) {
        sum++;
    }
}
```

2 loops nested = O(N^2)

iv.

```
sum = 0;
for (i = 0; i < n * n; i++) {
    for (j = 0; j < n * n; j++) {
        sum++;
    }
}
```

2 loops nested = O(N^2)