

## CSCI 104 Fall 2020 Week 6 Group Work

```
bool f1(int x){
    if (x == 0) return false;

    while (x != 1){

        if (x % 2 != 0) return false;

        x /= 2;
    }
    return true;
}

void function1(int x){
    if (f1(x)){
        for (int i = 0; i < x ; i++)
            cout << i << endl;
    } else {
        cout << x << endl;
    }
}

void function2(int x){
    if (!(x & (x-1))){ /*Using bitwise and */
        for (int i = 0; i < x ; i++)
            cout << i << endl;
    } else {
        cout << x << endl;
    }
}

void function3(int n){
    for (int i = 1; i <= n; i++){
        function1(i);
    }
}

void function4(int n){
    for (int i = 1; i <= n; i++){
        function2(i);
    }
}
```

1. What is the worst case runtime analysis of function3?
2. What is the worst case runtime analysis of function4?

```

void runTimeFun(int n){
    for (int i = 1; i <= n; i++){
        for (int j = 0; j < n; j += i) {
            for (int k = 0; k < n ; k++) {
                if (i % 2 == 0) {
                    for (int m = 1; m <= n ; m *= 2){
                        cout << m << endl;
                    }
                } else {
                    cout << i << endl;
                }
            }
        }
    }
}

```

What is the worst case runtime analysis of runTimeFun? Show all your work.