

CSCI 104 Participation Quiz 4: February 21, 2019

Name, ID:

```
bool ispowertwo(double x){
    if (x == 1) return true;
    if (x < 1) return false;
    if (x > 1) return ispowertwo(x/2);
}

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

void function2(int x){
    if (!(x & (x-1))){ /*condition is true if and only if x is a power of 2. Checks 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?

- (a) $\Theta(n)$
- (b) $O(n^2)$
- (c) $\Theta(n^2)$
- (d) $\Theta(n \log n)$

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

- (a) $\Theta(n)$
- (b) $O(n^2)$
- (c) $\Theta(n^2)$
- (d) $\Theta(n \log n)$