

## 1) (5 pts) DSN (Recursive Coding)

Mathematically, given a function  $f$ , we recursively define  $f^k(n)$  as follows: if  $k = 1$ ,  $f^1(n) = f(n)$ . Otherwise, for  $k > 1$ ,  $f^k(n) = f(f^{k-1}(n))$ . Assume that a function,  $f$ , which takes in a single integer and returns an integer already exists. Write a recursive function  $fcomp$ , which takes in both  $n$  and  $k$  ( $k > 0$ ), and returns  $f^k(n)$ .

```
int f(int n);
```

Solution #1

```
int fcomp(int n, int k) {  
    if (k == 1) return f(n);  
    return f(fcomp(n, k-1));  
}
```

Solution #2

```
int fcomp(int n, int k) {  
    if (k == 1) return f(n);  
    return fcomp(f(n), k-1);  
}
```

**Grading:** 2 pts for the base case.  
3 pts for the recursive case.