

# Handout 8

## Runtime practice

How many steps are needed for each of the following code blocks? Classify each one as either:  $O(1)$ ,  $O(N)$ ,  $O(\log N)$ ,  $O(N \log N)$ , or  $O(N^2)$

*Credit: Jeff Knerr*

### Question 1.

(a).

```
n = int(input("n: "))
for i in range(n):
    print(i)
```

(b).

```
n = int(input("n: "))
for i in range(100):
    print(i*n)
```

(c).

```
n = int(input("n: "))
for i in range(n):
    print(i)
for j in range(n):
    print(j)
```

(d).

```
n = int(input("n: "))
for i in range(n):
    for j in range(n):
        print(i, j)
```

(e).

```
n = int(input("n: "))
for i in range(n):
    for j in range(i, n):
        print(i, j)
```

(f).

```
n = int(input("n: "))
for i in range(n):
```

```
for j in range(10):  
    print(i, j)
```

(g).

```
n = int(input("n: "))  
while n > 1:  
    print(n)  
    n = n/2
```

(h).

```
lst = [1,2,3,5,7,12,19,34,55,67,99,101]  
n = len(lst)  
mid = int(n/2)  
print(lst[mid])
```

(i).

```
n = int(input("n: "))  
for i in range(n):  
    k = n  
    while k > 1:  
        print(i, k)  
        k = k/2
```