

## CSCI046 Notes: Runtime Analysis

**Example 1.** Answer the questions below based on the following python code:

---

```
1 print('x')
2 print('x')
3 print('x')
4
5 for i in range(10):
6     print('y')
7
8 for i in range(10,20):
9     print('z')
10    print('z')
11    print('z')
```

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1. What is the exact number of times that the letter x will be printed?
2. What is the exact number of times that the letter y will be printed?
3. What is the exact number of times that the letter z will be printed?

**Example 2.** Answer the questions below based on the following python code:

---

```
1 for i in range(10):
2     print('x')
3 for i in range(20):
4     print('x')
5
6 for i in range(10):
7     for j in range(20):
8         for k in range(30):
9             print('y')
10
11 print('z')
12 for i in range(10):
13     print('z')
14     for j in range(10):
15         print('z')
16         print('z')
17     for j in range(10):
18         print('z')
19 for i in range(10):
20     print('z')
```

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1. What is the exact number of times that the letter x will be printed?
2. What is the exact number of times that the letter y will be printed?
3. What is the exact number of times that the letter z will be printed?

**Example 3.** Answer the questions below based on the following python code:

---

```
1 for i in range(n):
2     print('x')
3 for i in range(n*2):
4     print('x')
5
6 for i in range(n):
7     for j in range(n*2):
8         for k in range(n*3):
9             print('y')
10
11 print('z')
12 for i in range(n):
13     print('z')
14     for j in range(n):
15         print('z')
16         print('z')
17     for j in range(n):
18         print('z')
19 for i in range(n):
20     print('z')
```

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1. What is the exact number of times that the letter x will be printed?
2. What is the exact number of times that the letter y will be printed?
3. What is the exact number of times that the letter z will be printed?

