

# Exhaustive Search

four letters, only 'a's and 'b's

baaa  
aaaa  
aaab  
baba  
baab  
...

$2^4 = 16$  possibilities

a a a a  
a a a b  
a a b a  
a a b b  
...

$26^8 = 200$  billion

b b b b

$128^8 = 70$  quadrillion

```
public static void fourAB() {  
    fourAB("");  
}
```

```
private static void fourAB(String soFar) {  
    if (soFar.length() == 4) {  
        System.out.println(soFar);  
    } else {
```

```
        // soFar = "aa"
```

```
        // choose 'a' → "aaa"
```

```
        // choose 'b' → "baaab"
```

```
        fourAB(soFar + "a");
```

```
        fourAB(soFar + "b");  
    }  
}
```

```
public static void diceRoll(int dice) {  
    diceRoll(dice, new ArrayList<Integer>());  
}
```

```
private static void diceRoll(int remaining,  
    List<Integer> chosen) {  
    if (remaining == 0) {  
        System.out.println(chosen);  
    } else {
```

```
        // remaining = 2, chosen = [1, 2]  
        // 1, 2, 3, 4, 5, 6
```

```
        for (int i = 1; i <= 6; i++) {  
            chosen.add(i);  
            diceRoll(remaining - 1, chosen);  
        }  
    }
```