1 Prime Number Checks

A. Java – Variations

1. Simple loop (1 to num)

```java
int num = 7;

int count = 0;

if(num < 2){

    System.out.println("Not prime");

} else {

    for(int i = 1; i <= num; i++){

        if(num % i == 0){

            count++;

        }

    }

    if(count == 2){

        System.out.println("Prime");

    } else {

        System.out.println("Not prime");

    }

}
```

2. Efficient loop (2 to num/2)

```java
int num = 29;

boolean isPrime = true;

if(num < 2){

    isPrime = false;

} else {

    for(int i = 2; i <= num/2; i++){

        if(num % i == 0){

            isPrime = false;
```

```java
        break;

      }

    }

}

if(isPrime){

    System.out.println("Prime");

} else {

    System.out.println("Not Prime");

}
```

3. Efficient loop using function

```java
public static boolean isPrime(int num){

    if(num < 2) return false;

    for(int i = 2; i <= num/2; i++){

        if(num % i == 0) return false;

    }

    return true;

}


int num = 31;

if(isPrime(num)){

    System.out.println("Prime");

} else {

    System.out.println("Not Prime");

}
```

B. Python – Variations

1. Simple for loop (2 to num-1)

```python
num = 7
```

```python
if num < 2:
    print("Not Prime")
else:
    for i in range(2, num):
        if num % i == 0:
            print("Not Prime")
            break
    else:
        print("Prime")
```

2. Using flag variable

```python
num = 13
is_prime = True
if num < 2:
    is_prime = False
else:
    for i in range(2, num):
        if num % i == 0:
            is_prime = False
            break
if is_prime:
    print("Prime")
else:
    print("Not Prime")
```

3. Function version

```python
def is_prime(num):
    if num < 2:
        return False
    for i in range(2, num):
```

```python
        if num % i == 0:

            return False

    return True
```

```python
num = 19

print("Prime" if is_prime(num) else "Not Prime")
```

4. Pythonic one-liner

```python
num = 17

print("Prime" if num > 1 and all(num % i != 0 for i in range(2, num)) else "Not Prime")
```

2️⃣ Even/Odd Checks

A. Java

```java
int num = 7;

if(num % 2 == 0){

    System.out.println("Even");

} else {

    System.out.println("Odd");

}
```

Works for: positive, negative, zero.

B. Python

```python
num = 7

if num % 2 == 0:

    print("Even")

else:

    print("Odd")
```

Alternative Pythonic one-liner

```python
num = 7
```

```python
print("Even" if num % 2 == 0 else "Odd")
```