

Methoden



```
static int R(int i) {
    if (i>0)
        return i + R(i-1);
    return i;
}
static int I(int i) {
    int res;
    for (res = 1; i>0; --i)
        res *= i;
    return res;
}
public static void main(String[] args) {
    System.out.println(
        R(I(3)) + " " + I(R(3)) ); // ?
}
```

Was gibt das Programm aus?

- (1) 3 3
- (2) 3 6
- (3) 6 6
- (4) 6 120
- (5) 21 120
- (6) 21 720
- (7) 120 720
- (8) 120 1440

Methode I (Iterativ)



```
static int I(int i) {  
    int res;  
    for (res = 1; i > 0; --i)  
        res *= i;  
    return res;  
}
```

→ I berechnet die Fakultät

$$i! = \prod_{k=1}^i k$$

1. $i = 3;$
2. $res = 1; i > 0 == true$
3. $res = res * 3; [=3]$
4. $i = 2; i > 0 == true$
5. $res = res * 2; [=6]$
6. $i = 1; i > 0 == true$
7. $res = res * 1; [=6]$
8. $i = 0; i > 0 == false$
9. → $res = 6$

Methode R (Rekursiv)



```
static int R(int i) {  
    if (i>0)  
        return i + R(i-1);  
    return i;  
}
```

→ R berechnet die
Summe $\sum_{k=0}^i k$

R(3) → i = 3
i > 0 → return 3 + R(2);
R(2) → i = 2;
i > 0 → return 2 + R(1);
R(1) → i = 1;
i > 0 → return 1 + R(0);
R(0) → i = 0;
i = 0 → return 0;

0
1
3
6

Methoden



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        return i + R(i-1);
    return i;
}
static int I(int i) {
    int res;
    for (res = 1; i>0; --i)
        res *= i;
    return res;
}
public static void main(String[] args) {
    System.out.println(
        R(I(3)) + " " + I(R(3)) ); // ?
}
```

$$I(3) = 6$$

$$R(3) = 6$$

$$R(I(3)) = R(6) = 21$$

$$I(R(3)) = I(6) = 720$$

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```
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    if (i>0)
        return i + R(i-1);
    return i;
}
static int I(int i) {
    int res;
    for (res = 1; i>0; --i)
        res *= i;
    return res;
}
public static void main(String[] args) {
    System.out.println(
        R(I(3)) + " " + I(R(3)) ); // ?
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