DASAR PEMROGRAMAN

Pertemuan IX

Tujuan

- Mahasiswa memahami fungsi rekursif
- Mahasiswa mampu membuat dan menggunakan fungsi rekursif

REKURSIF

Materi

ITERASI

```cpp
#include <iostream>

using namespace std;

int main()
{
    for (int i = 0 ; i < 5; i++)
    {
        cout << "angka = " << i << endl;
    }
    return 0;
}
```

```
angka = 0
angka = 1
angka = 2
angka = 3
angka = 4
```

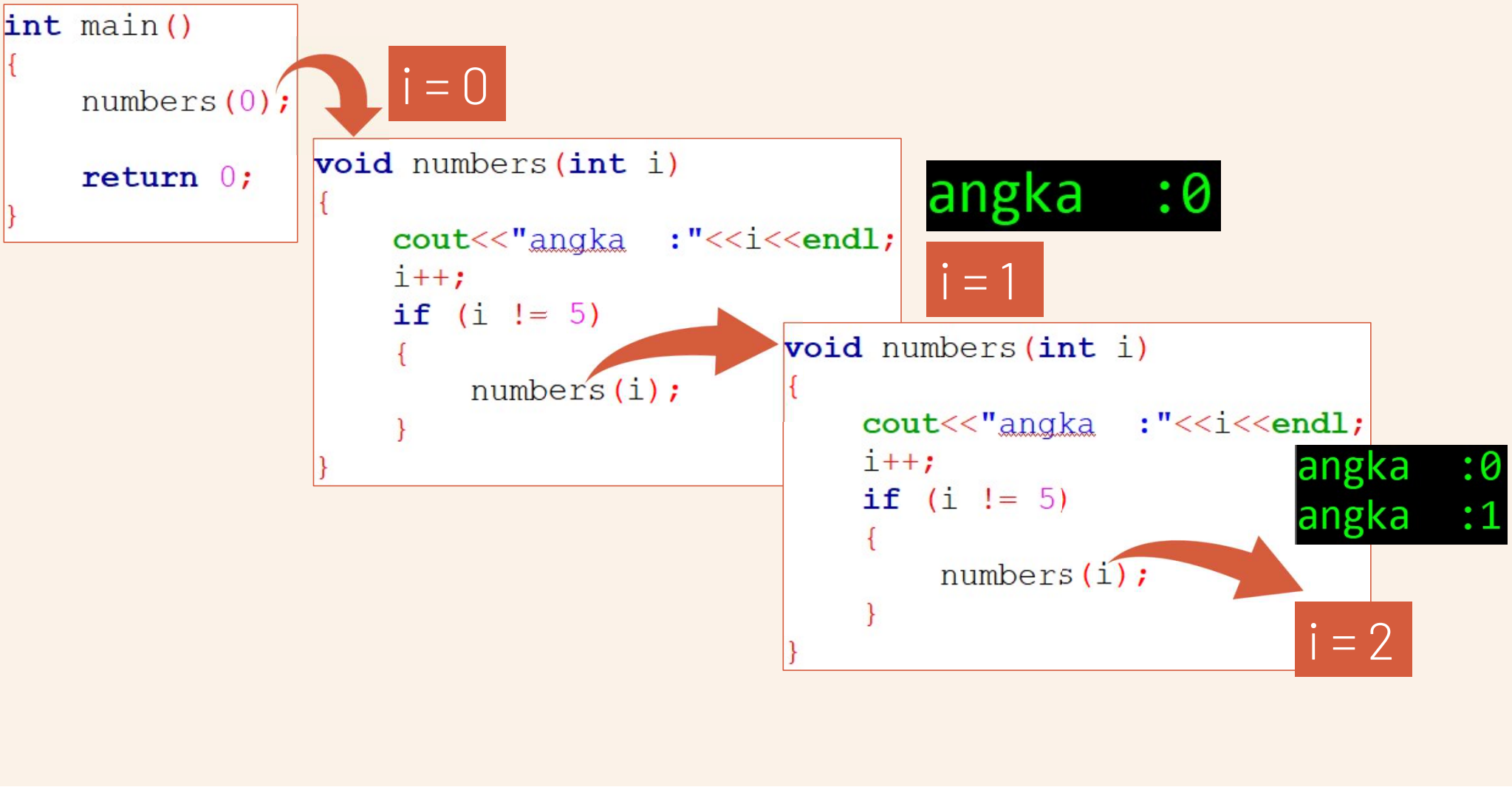
Bagaimana membuat program serupa tanpa menggunakan perulangan?

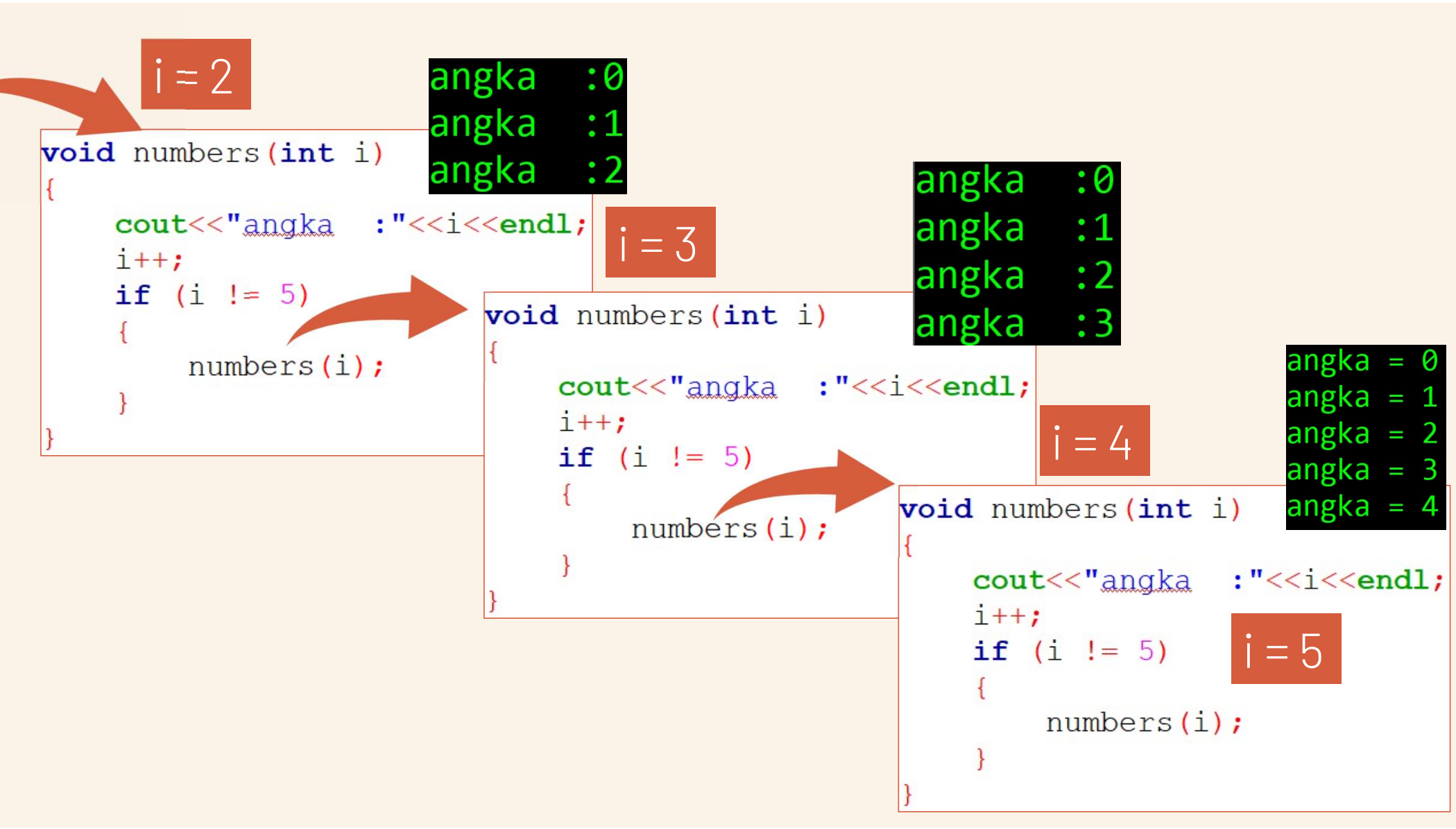
REKURSIF

Recursive is the process of defining a problem (or the solution to a problem) in terms of (a simpler version of) itself.

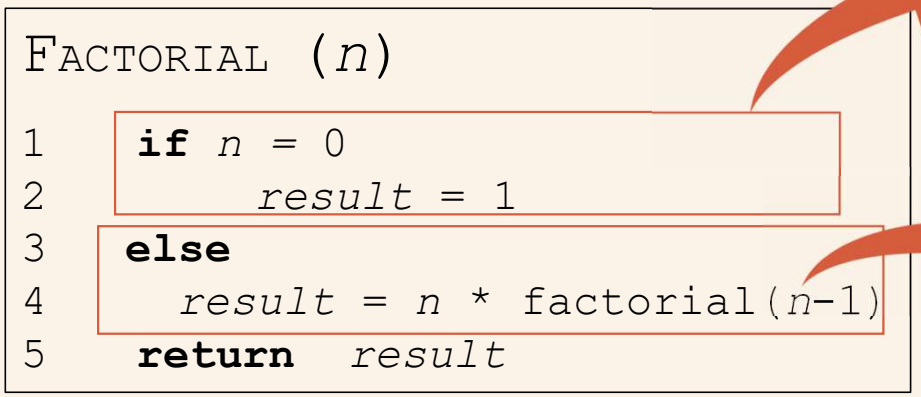
```cpp
#include <iostream>

using namespace std;

void numbers(int i);

int main()
{
    numbers(0);

    return 0;
}

void numbers(int i)
{
    cout << "angka  :" << i << endl;
    i++;
    if (i != 5)
    {
        numbers(i);
    }
}
```

```
angka  :0
angka  :1
angka  :2
angka  :3
angka  :4
```


int main()
{
numbers(0);
return 0;
}
i = 0
void numbers(int i)
{
cout<<"angka :"<<i<<endl;
i++;
if (i != 5)
{
numbers(i);
}
}
angka :0
i = 1
void numbers(int i)
{
cout<<"angka :"<<i<<endl;
i++;
if (i != 5)
{
numbers(i);
}
}
angka :0
angka :1
i = 2


i = 2
angka :0
angka :1
angka :2
void numbers(int i)
{
cout<<"angka :"<<i<<endl;
i++;
if (i != 5)
{
numbers(i);
}
}
i = 3
angka :0
angka :1
angka :2
angka :3
void numbers(int i)
{
cout<<"angka :"<<i<<endl;
i++;
if (i != 5)
{
numbers(i);
}
}
i = 4
angka = 0
angka = 1
angka = 2
angka = 3
angka = 4
void numbers(int i)
{
cout<<"angka :"<<i<<endl;
i++;
if (i != 5)
{
numbers(i);
}
}
i = 5

BAGIAN REKURSIF



Basis

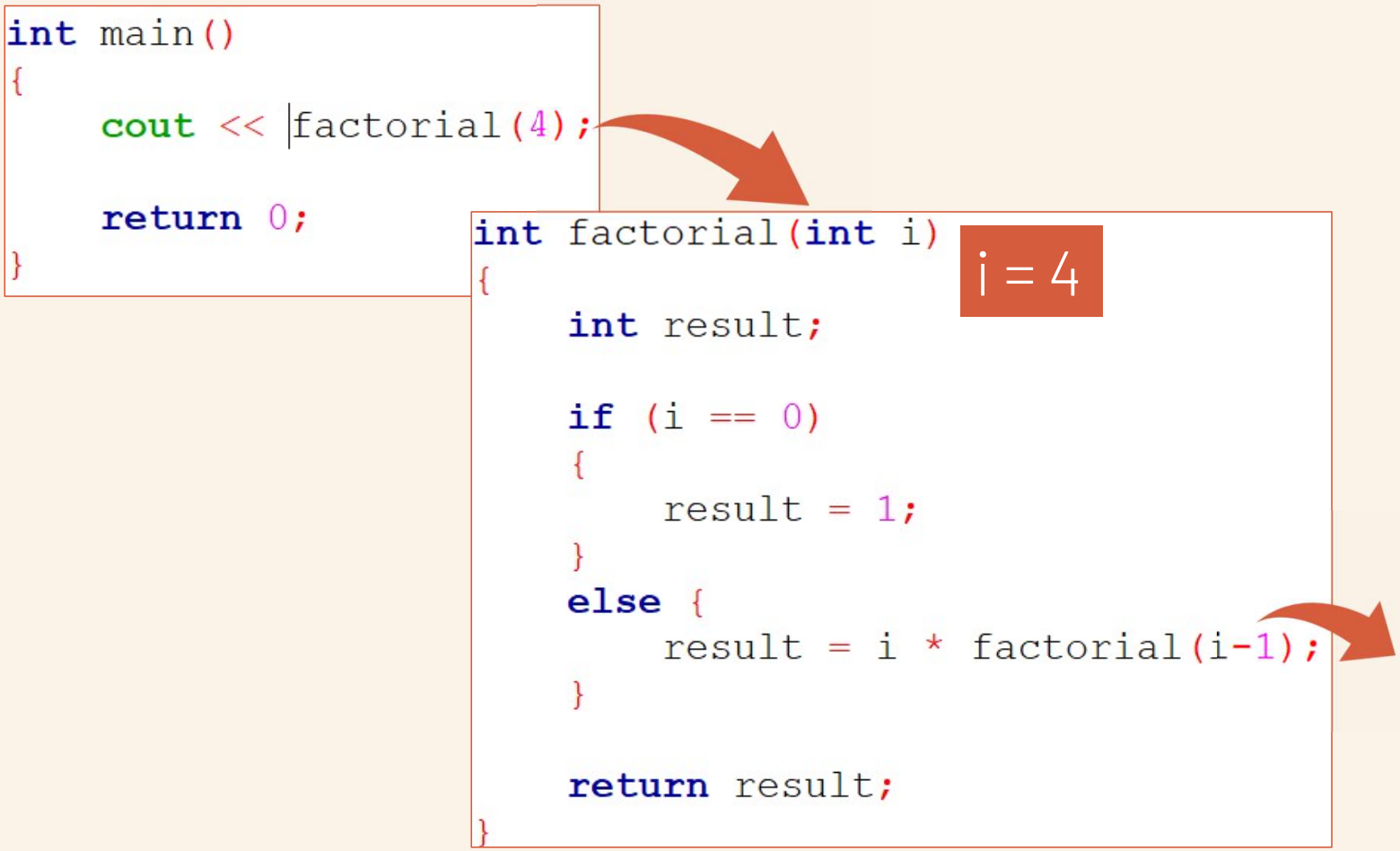
Bagian yang berisi kasus yang terdefinisi secara eksplisit. Bagian ini juga sekaligus menghentikan rekursif.

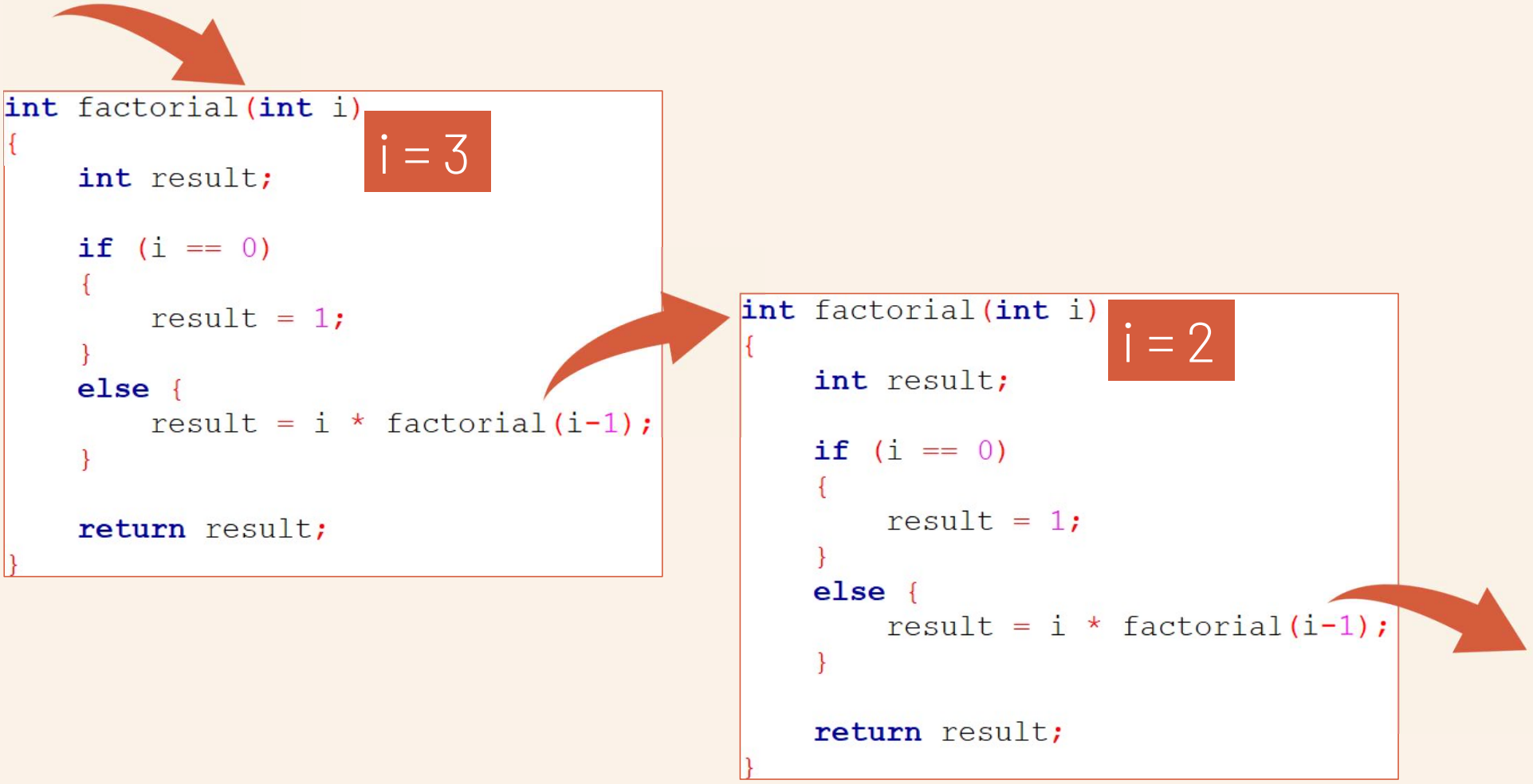
Rekurens

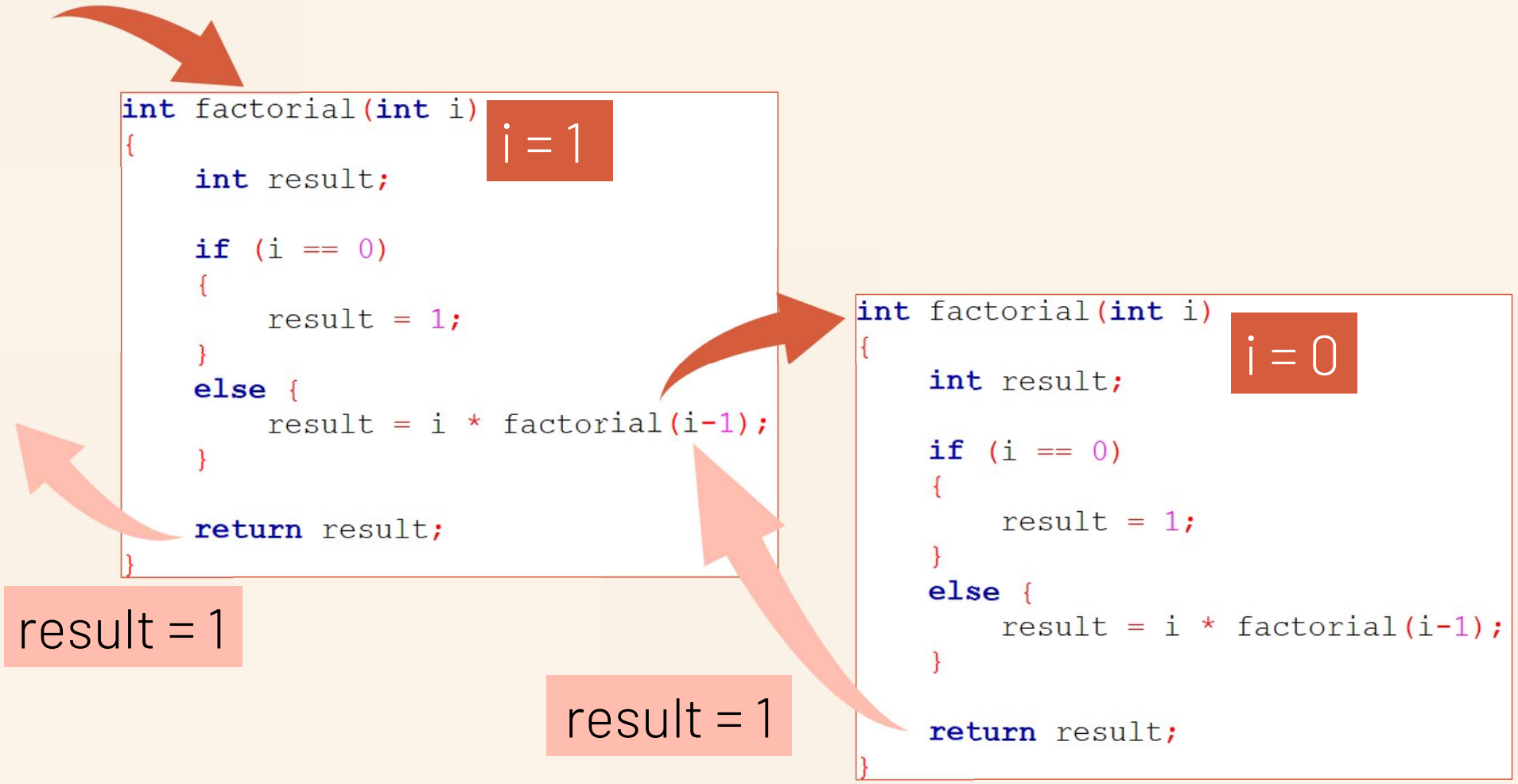
Bagian ini mendefinisikan objek dalam terminologi dirinya sendiri atau bagian yang memanggil dirinya sendiri dengan parameter yang nilainya sudah berubah.

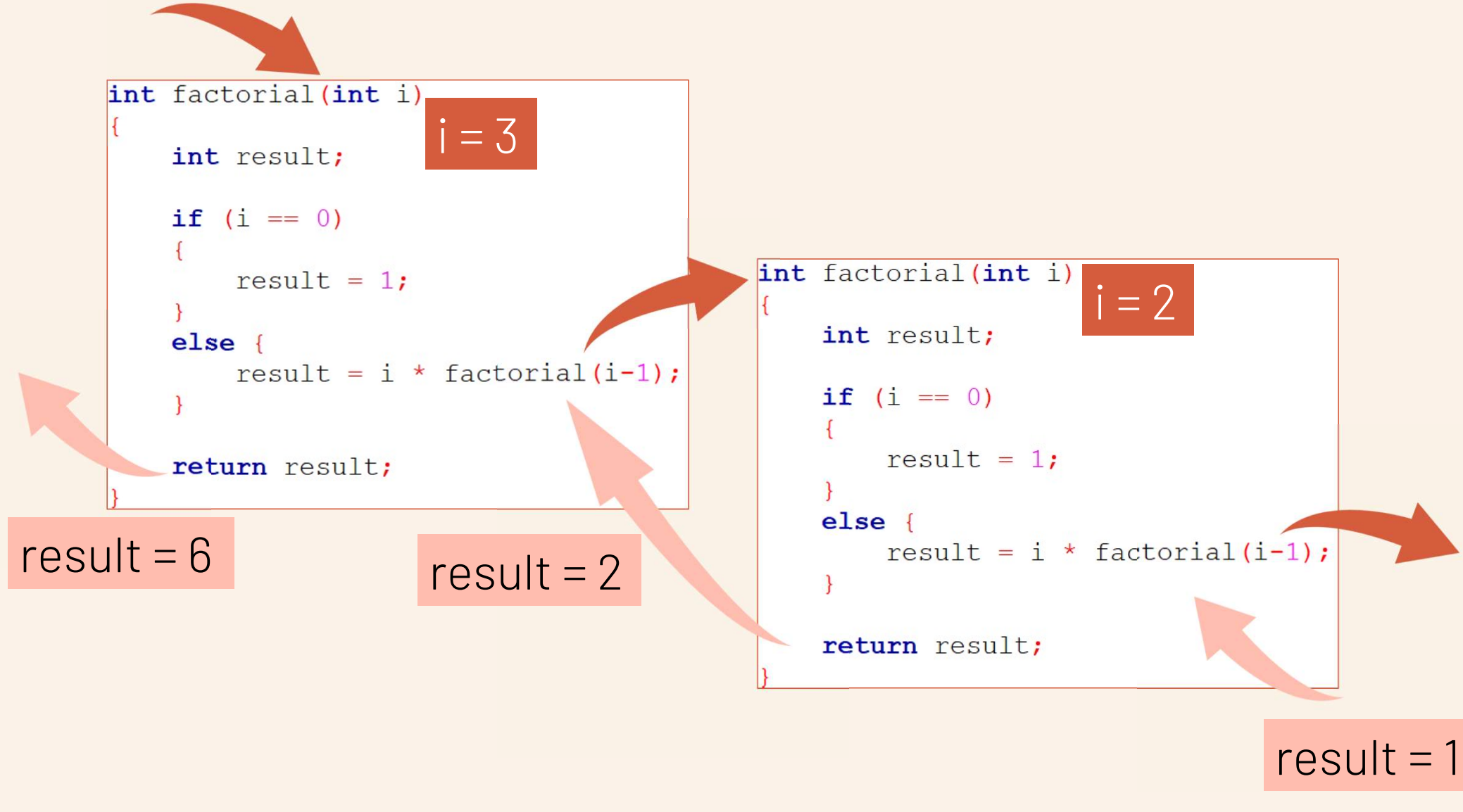
CONTOH

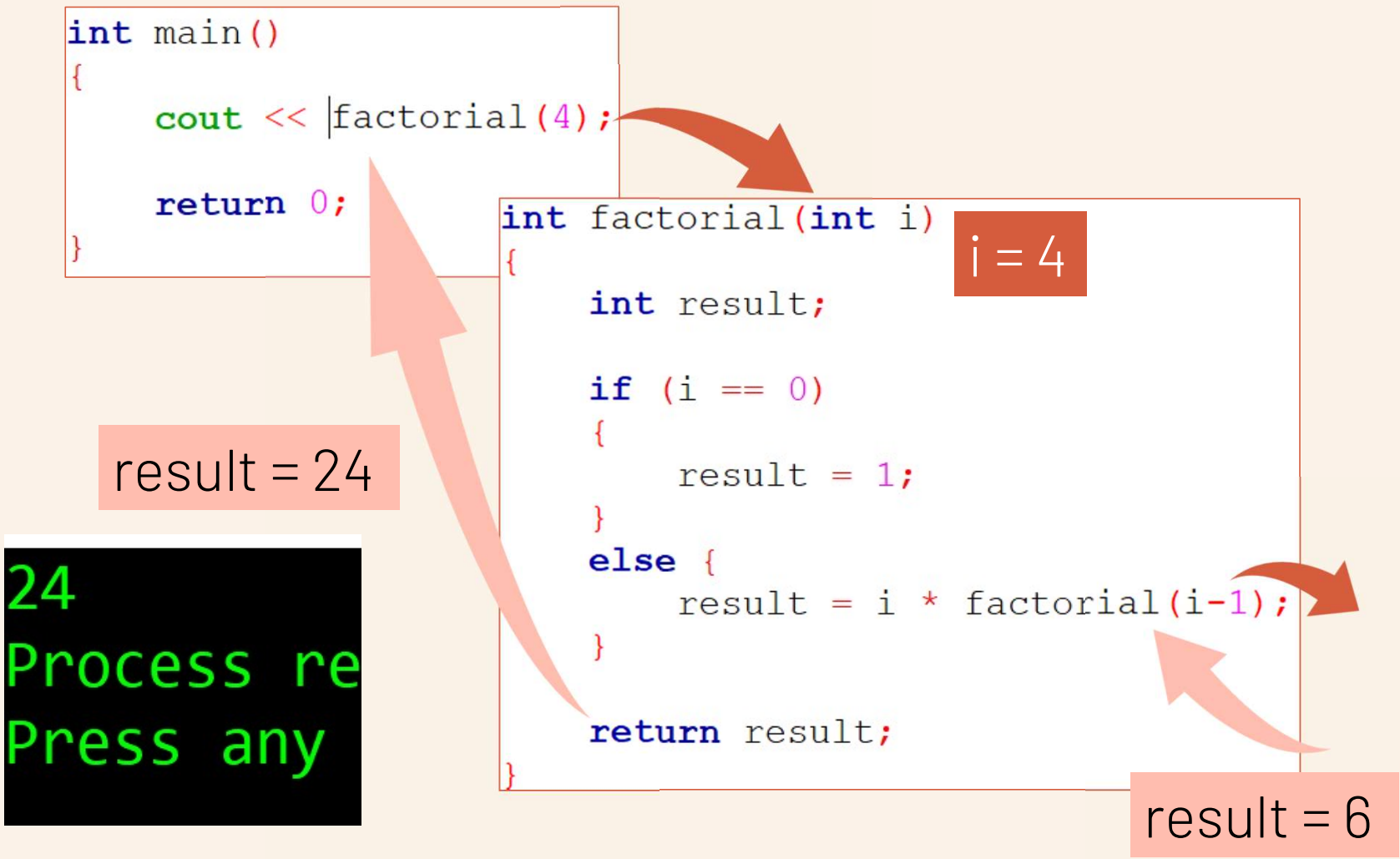
```
FACTORIAL (n)
1    if n = 0
2         result = 1
3    else
4      result = n * factorial(n-1)
5    return  result
```


int main()
{
cout << factorial(4);
return 0;
}
int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 4


int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 3
int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 2


int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 1
int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 0
result = 1
result = 1


int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 3
result = 6
int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 2
result = 2
result = 1


int main()
{
cout << factorial(4);
return 0;
}
int factorial(int i)
{
int result;
if (i == 0)
{
result = 1;
}
else {
result = i * factorial(i-1);
}
return result;
}
i = 4
result = 24
result = 6
24
Process re
Press any

LATIHAN SOAL

```cpp
#include <iostream>

using namespace std;

void cetak(int angka);

int main()
{
    cetak(4);

    return 0;
}

void cetak(int angka)
{
    if (angka == 1)
    {
        cout << "1";
    }
    else
    {
        cout << angka << " ";
        cetak(angka-1);
    }
}
```

LATIHAN 1

Telusuri program disamping!

```cpp
#include <iostream>

using namespace std;

int kali(int bilA, int bilB);

int main()
{
    cout << "6 x 3 = " << kali(6,3);

    return 0;
}

int kali(int bilA, int bilB)
{
    int hasil = 0;
    for (int i=bilB;i>0;i--)
    {
        hasil = hasil + bilA;
    }

    return (hasil);
}
```

LATIHAN 2

Telusuri program disamping!