

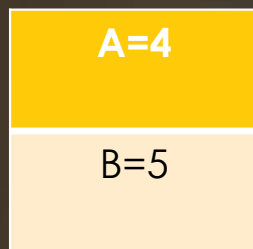
Call by value vs Call by reference

- ▶ Function can be invoked/called in two ways:
 - ▶ Call by value
 - ▶ Call by reference

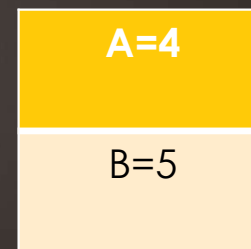
Call by value

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- ▶ In call by value:
 - ▶ Actual parameters are copied to functions formal parameters
 - ▶ There are two copies of parameters at different memory locations:



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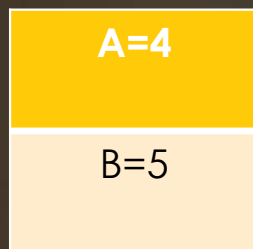


Function
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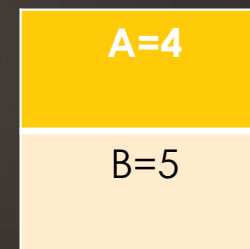
Call by value

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- ▶ In call by value:
 - ▶ Any changes made inside the function are made into the function copy
 - ▶ While original copy remains unaffected in the calling function



Original
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Function
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```
#include<iostream>
using namespace std;

void swap(int a,int b){
    int t;
    t=a;
    a=b;
    b=t;
    cout<<"Inside called function: "<<"a="<<a<<"", b="<<b<<endl;
}

int main(){
    int a=4;
    int b=5;
    swap(a,b);
    cout<<"Inside calling function: "<<"a="<<a<<"", b="<<b;

    return 0;
}
```

Example:
Swap
two
values

Call by Reference

- ▶ In call by reference:
 - ▶ Address of the actual parameters is passed to the formal parameters
 - ▶ Now formal and actual parameters have a single copy
 - ▶ Any changes made inside the function are also visible in the calling function

Example: Swap two values

```
#include<iostream>
using namespace std;

void swap(int* a,int* b){
    int t;
    t=*a;
    *a=*b;
    *b=t;
}

int main(){
    int a=4;
    int b=5;
    swap(a,b);
    cout<<a<<endl<<b;
    return 0;
}
```

Tasks

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- ▶ Define a function which takes value in kilometers as its parameter and converts it into meters and display it on console screen.
- ▶ Define a function which takes an array as its parameter and returns an array which contains two values, first value of the returned array is the sum of even numbers from the parameter array, and second value is the sum of the odd numbers from the parameter array.
- ▶ Define a function which calculates area of a square, pass appropriate parameters to this function
- ▶ Define a function which takes height of a person in feet and returns the height value in centimeter
- ▶ Define a function which takes two arrays as parameters, first names array and last names array and display the first name and last name concatenated on the screen,