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Function in C++

Problem statement

let
a = 6
b = 8

suppose we have to calculate
(i) prime or not for a
(ii) factorial of a
(iii) prime or not for b
(iv) factorial of b
(v) prime no b-a
(vi) factorial b-a

```
int main()
{
  int a, b;
  cin>>a>>b;
  [prime] - a
  [factorial] - a
  [prime] - b
  [factorial] b
  :
}
```

In above problem, for, prime no. we have to write 3 times with different number, in the same way we have to write factorial program three times. for the same work we have to write same code for multiple times. so here function came into picture.

Function :

function says don't write some piece of code multiple times, write once and reuse it when ever required.

- Reusibility.
- Code Readability.

Syntax :

```
return_type function_name (parameters)
{
    // code

    return value;
}
```

Return Type

- int
- float
- char
- double
- void

eg

```
bool prime(int n)
{ if(n<2)
    return 0;
  for(i=2; i<n; i++)
  {
    if(n%i==0)
      return 0;
  }
  return 1;
}
```

Argument ↓ function

```
int factorial (int n) // declaration
{
    int ans = 1;
    for(int i = 1; i <= n; i++)
        ans = ans * i;
    return ans;
}
```

function defination

```
int main()
{
    int a, b;
    cin >> a >> b;
    cout << prime(a);
    cout << factorial(a);
    cout << Prime(b);
    cout << factorial(b);
    cout << prime(b-a);
    cout << factorial(b-a);
}
```

function call

e.g (11)

```
int Sum(int a, int b)
{
    int ans = a+b;
    return ans;
}
int main()
{   int m=4, n=5;
    cout << sum(m, n);
}
```

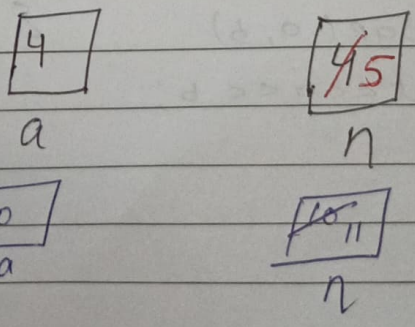
```
int fact(int n=3) // Default parameter.
{
    // code
}
```

in case of function call of default parameterized function. if you we pass some parameter during function call then that function will work on passed parameter, but if we do not pass any parameter that that function will do operation on default parameter which was given during function declaration/definition.

pass by value

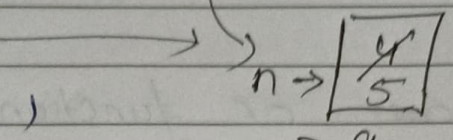
```
int main()
{ int a = 10;
  incr(a);
  cout<< a; // a=10
}
```

```
void incr(int n)
{
  n++);
}
```

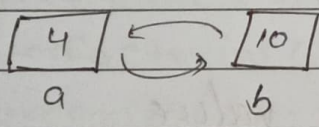


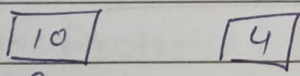
pass by reference

```
int incr(int &n)
{
    n++;
}
int main()
{
  int a = 4;
  incr(a);
  cout<<a; //5
}
```



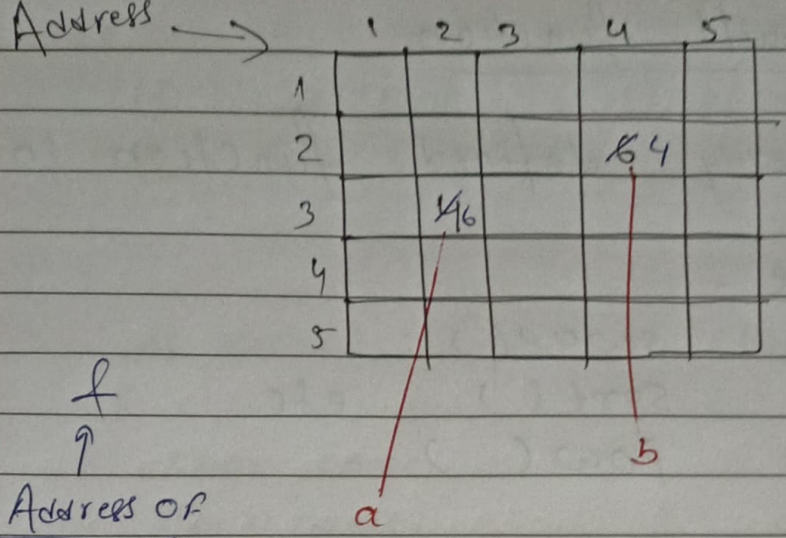
swap






```
int main()
{
  int a, b;
  cin>>a>>b;
  swap(a, b)
  cout<<a<<b;
}
```

```
// call by value
swap(int a, int b)
{
    int c;
    c = a;
    a = b;
    b = c;
} // will not swap.
// pass by reference.
swap(int &a, int &b)
{ int c;
  c = a;
  a = b
```



& → Address of.

function overloading

function with same name but with different parameter.

```
void swap (int &a, int &b)
{


}
void swap(float &x, float &y)
{


}.
```

Inbuilt. function.

Already defined function in c++.

Like -

swap( );
sqrt( ) .... etc.
pow( ) ..