

C++ in depth

Functions in c++



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Agenda

- ① inline
- ② default argument
- ③ reference variable
- ④ call by value, call by address, call by reference

inline

Function in a program to save memory space which becomes appreciable when a function is likely to be called many times.

However, everytime a function is called, it takes lot of extra time in executing a series of instructions for tasks such as jumping to the functions, saving registers, pushing arguments into the stack and returning to the calling function.

So, when function is small it is worthless to spend so much extra time in such tasks in cost of saving comparatively small space.

To eliminate the cost of call to small functions, C++ proposes a new feature called **inline** function.

An inline function is a function that is expanded in a line when it is invoked.

Compiler replaces the function call with the corresponding function code

inline is a request not a command

So the compiler may ignore the request in some situations:

Few of them are:

- Function containing loops, switch or goto
- Function with recursion
- Containing static variable

inline int add(int, int);

```
int add(int x, int y)
{
    return x+y;
}
```

default arguments

- We can set default values to the arguments in a function to let them allow to invoke it without passing value to the corresponding receiving variable.

- It is not necessary that all arguments should have some default values.
- During declaration of function, you can set default values to the arguments.
- Function cannot have non default argument after a default argument.

Formal Arguments

- ① Ordinary variables
- ② Pointer variables
- ③ Reference variable

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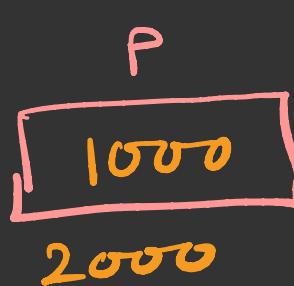
Reference Variable

int $x = 5;$



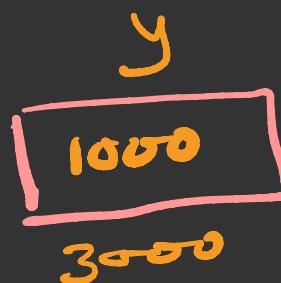
ordinary
variable

int *p;
 $p = \&x;$



pointer
variable

int &y = x;
 $y++;$



reference
variable

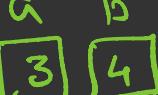
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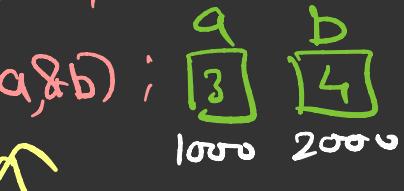
- ① declare करते समय & लगाना है,
पर उसे address of नहीं कोलना है।
- ② reference variable को declare
करते समय ordinary variable से
initialize करना compulsory है।
- ③ Reference variable जिसका reference
contain करता है, उसी को represent
करता है।

Call by value Call by address Call by reference

void f1(int, int);
 int a=3, b=4;
 f1(a, b); 
 ↪ call by value

void f1(int x, int y)
 { 

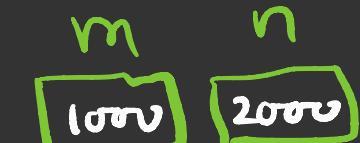
}

void f2(int*, int*);
 int a=3, b=4;
 f2(&a,&b); 
 ↪
call by reference
call by address

void f2(int *P, int *Q)
 { 

}

void f3(int&, int&);
 int a=3, b=4;
 f3(a,b); 
 ↪
call by reference

void f3(int &m, int &n)
 { 

}

```
scanf("%d", &x);
```

```
cin>>x;
```