C++ inline functions

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Outline

1. What is an inline function?
2. How to use inline functions
3. Advantages and disadvantages
4. Summary

Inline function – What is that?

- →a command for the compiler to substitute the call for a function by it‘s implementation = inline *expansion*
- →Compiler decides if function is substituted or executed

How to use inline functions

- Example:

```
inline int add(int x, int y)
{
   return x+y;
}
int calc()
{
 int p =3; int q=5;
 int result = add(p,q);
 return result;
 }
```

→

```
int result = add(p,q);
```

is substituted by:

```
int result = p+q;
```

How to inline a function (1)

1. Declaration and definition within class declaration → function is automatically `inline`:

```
 //Calculator.h
class Calculator
{
    private:
          int result;
     public:
          int getResult() const
          {
                return result;
          }
}
```

→ used when function is very short

How to inline a function (2)

2. Declaration and definition as inline function in header-file:

```
//Calculator.h
class Calculator
{
    private:
         int result;
    public:
         int getResult() const;
}

inline int Calculator::GetResult() const
{
          return result;
}
```

→ Used for longer, but still simple methods (no loops etc.)

Advantages

- Why should I use it?
  →Faster than ordinary function call, which goes as follows:
    - Put return adress on the stack
    - Put parameters on the stack
    - Execute function
    - Deallocate parameters
    - Jump back to starting point

Disadvantages

- Compiler decides in general itself which functions to inline → inline is a *recommendation* for the compiler
  - →Does not always result in gain in speed
  - →inline declaration is not always necessary
- Gain in speed is often very small, so that inlining is not needed
- inline breaks encapsulation because code is revealed, also the header-file is larger
- When changing an inline function, all the code, which uses the inline function, has to be recompiled

Summary

- Inline tells the compiler to substitute a function by its implementation, in case there is a gain in speed
- Used for short methods, which are frequently used, because it may be faster than an ordinary function call
- Should be used carefully, because it does not necessarily result in the desired way, because compiler decides itself when to inline a function

- Any Questions?

Soruce : http://1.bp.blogspot.com/_mbfqNmS63yQ/TAky5GWN2RI/AAAAAAAAA_0/49yXbk2ab_E/s1600/fragezeichen.gif

Thank you for your attention!

References

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