

Function and class template

Contents

- Need of generic programming.
- How to use template
- Function and class template.

Need of template

```
void swap(int &n1, int &n2)
{
    int temp;
    temp = n1;
    n1 = n2;
    n2 = temp;
}
```

```
void swap(float &n1 , float &n2)
{
    float temp;
    temp = n1;
    n1 = n2;
    n2 = temp;
}
```

```
void swap(double &n1 , double &n2)
{
    double temp;
    temp = n1;
    n1 = n2;
    n2 = temp;
}
```

Function overloading

1. Need to implement same behavior for different data type.
2. Can we provide common definition ??

Template

- Provides generic programming.
- Provides common definition which will work for different type of data which having same algorithm.
- There can be function templates or class templates.

Function Template

Syntax:

```
template < class type >
```

For e.g.

```
Template < class T >
void swap1(T &n1 , T &n2)
{
    T temp;
    temp = n1;
    n1 = n2;
    n2 = temp;
}
```

```
int main()
{
    int n1 = 10 , n2 =20;
    swap1 ( n1 , n2 );

    float no1=10.20 ,no2= 12.30;
    swap1 ( no1 , no2);
}
```

class template

```
template <class T>
```

```
class Swap
```

```
{
```

```
    T no1,no2;
```

```
    public:
```

```
    void accept();
```

```
    void swapNo();
```

```
};
```

Class Template

```
template <class T>
```

```
void Swap<T>::swapNo()
```

```
{
```

```
    cout<<"Before swapping No1= "<<no1<<"\tNo2="<<no2<<endl<<endl;
```

```
    T temp;
```

```
    temp=no1;
```

```
    no1 = no2;
```

```
    no2 = temp;
```

```
    cout<<"After swapping No1= "<<no1<<"\tNo2= "<<no2<<endl<<endl;
```

```
}
```

```
template <class T>
```

```
void Swap<T>::accept()
```

```
{
```

```
    cout<<"Enter the two no\n";
```

```
    cin>>no1>>no2;
```

```
}
```

Class Template

```
int main()
{

    Swap <int> s1;
    s1.accept();
    s1.swapNo();

    Swap <float> s2;
    s2.accept();
    s2.swapNo();
    getch();
}
```


Lab Assignments

- Write function template to add no.
- Write class template accept and display different types of array data.
- Write a program to perform stack operation using class template.