Assignment – 35

A Job Ready Bootcamp in C++, DSA and IOT

Templates

Name: Tushar Maliye Date:21/12/2022

User id: [tusharmaliye59@gmail.com](mailto:tusharmaliye59@gmail.com)

1. Write a C++ program to demonstrate the addition of multiple types of data using

generic functions or templates.

PROGRAM:

#include<iostream>

using namespace std;

template <class T,class F,class P>

P add(T x, F y)

{

return (x+y);

}

int main()

{

float sum1=add<int,float,float>(5,2.5);

int sum2=add<int,int,int>(4,8);

cout<<"Addition of number is : "<<sum1<<endl;

cout<<"Addition of number is : "<<sum2<<endl;

return 0;

}

OUTPUT:

Addition of number is : 7.5

Addition of number is : 12

--------------------------------

Process exited after 0.3362 seconds with return value 0

Press any key to continue . . .

2. Write a C++ Program to find Largest among two numbers using function template.

PROGRAM:

#include<iostream>

using namespace std;

template<class T>

T maxi(T x, T y)

{

return x>y?x:y;

}

int main()

{

int x,y;

cout<<"Enter two numbers : "<<endl;

cin>>x>>y;

cout<<"maximum number is "<<maxi<int>(x,y);

cout<<endl;

return 0;

}

Output:

Enter two numbers :

8 6

maximum number is 8

--------------------------------

Process exited after 11.9 seconds with return value 0

Press any key to continue . . .

3. Write a C++ program to find the largest of three elements using a template.

PROGRAM:

#include<iostream>

using namespace std;

template<class T>

T maxi(T x, T y,T z)

{

if(x=y=z)

return x;

else if(x>y && x>z)

return x;

else if(y>x && y>z)

return y;

else if(z>x && z>y)

return z;

}

int main()

{

int x,y,z;

cout<<"Enter three numbers : "<<endl;

cin>>x>>y>>z;

cout<<"maximum number is "<<maxi<int>(x,y,z);

cout<<endl;

return 0;

}

OUTPUT:

Enter three numbers :

8 1 9

maximum number is 9

--------------------------------

Process exited after 4.362 seconds with return value 0

Press any key to continue . . .

4. Write a C++ Program to Swap data using function template.

PROGRAM:

#include<iostream>

using namespace std;

template< typename T>

void Swap(T &x,T &y)

{

T temp;

temp= x;

x=y;

y=temp;

}

int main()

{

int x=2, y=25;

float f1=2.3, f2=8.7;

char c1='a', c2='b';

cout<<"before passing the data to swap: "<<endl;

cout<<" i1 = "<<x<<", i2 = "<<y<<endl;

cout<<" f1 = "<<f1<<", f2 = "<<f2<<endl;

cout<<" c1 = "<<c1<<", c2 = "<<c2<<endl;

cout<<"after swapping: "<<endl;

Swap<int>(x,y);

Swap<float> (f1,f2);

Swap<char> (c1,c2);

cout<<" i1 = "<<x<<", i2 = "<<y<<endl;

cout<<" f1 = "<<f1<<", f2 = "<<f2<<endl;

cout<<" c1 = "<<c1<<", c2 = "<<c2<<endl;

}

Output:

before passing the data to swap:

i1 = 2, i2 = 25

f1 = 2.3, f2 = 8.7

c1 = a, c2 = b

after swapping:

i1 = 25, i2 = 2

f1 = 8.7, f2 = 2.3

c1 = b, c2 = a

--------------------------------

Process exited after 0.287 seconds with return value 0

Press any key to continue . . .

5. Write a C++ Program to Add two numbers using function template.

PROGRAM:

#include<iostream>

using namespace std;

template< typename T>

T additon( T x,T y)

{

return x+y;

}

int main ()

{

int x,y;

cout<<"Enter the two numbers :"<<endl;

cin>>x>>y;

cout<<" Addtion of two number is "<<additon<int>(x,y);

cout<<endl;

return 0;

}

OUTPUT:

Enter the two numbers :

5 9

Addtion of two number is 14

--------------------------------

Process exited after 2.949 seconds with return value 0

Press any key to continue . . .

6. Write a C++ Program to find Sum of Array using function template.

PROGRAM:

#include<iostream>

using namespace std;

template<class T>

T sum( T a[], int size)

{

T sum=0;

for(int i=1;i<=size;i++)

{

sum=sum+a[i];

}

return sum;

}

int main()

{

int size;

cout<<"Enter the size of the array:"<<endl;

cin>>size;

int a[size];

cout<<"Enter the values: "<<endl;

for(int i=1; i<=size;i++)

{

cin>>a[i];

}

cout<<"sum of the values is "<<sum<int>(a,size);

return 0;

}

Output:

Enter the size of the array:

5

Enter the values:

10 20 30 40 50

sum of the values is 150

--------------------------------

Process exited after 8.158 seconds with return value 0

Press any key to continue . . .

PROGRAM:

8. Write a C++ Program to implement push and pop methods from stack using

template.

PROGRAM:

#include<iostream>

#include<string>

using namespace std;

template<class T>

class stack

{

int top;

T s[100];

public:

stack()

{

top=-1;

}

~stack()

{

top=-1;

}

void push(T value)

{

if(is\_stack\_full())

{

cout<<"stack overflow"<<endl;

}

else

{

s[++top]=value;

}

}

int is\_stack\_empty()

{

if(top==-1)

return 1;

else

return 0;

}

int is\_stack\_full()

{

if(top==99)

return 1;

else

return 0;

}

T pop()

{

if(is\_stack\_empty())

cout<<"stck undderflow"<<endl;

else

return s[top--];

}

T Top ()

{

if(is\_stack\_empty())

{

cout<<"stack is under flow"<<endl;

return 0;

}

else

return s[top];

}

};

int main()

{

stack <int> int\_s;

stack <string> str\_s;

int\_s.push(2);

int\_s.push(8);

int\_s.push(28);

cout<<int\_s.Top()<<endl;

str\_s.push("tushar");

str\_s.push("maliye");

str\_s.push("great");

cout<<str\_s.Top()<<endl;

cout<<int\_s.pop()<<endl;

cout<<str\_s.pop()<<endl;

cout<<str\_s.pop()<<endl;

return 0;

}

Output:

28

great

28

great

maliye

--------------------------------

Process exited after 0.09227 seconds with return value 0

Press any key to continue . . .