

Function overloading

- In a C++ program, several functions can have the same name
 - This is called **function overloading** or **overloading a function name**
- Two functions are said to have **different formal parameter lists** if both functions have:
 - A different number of formal parameters, or
 - If the number of formal parameters is the same, then the data type of the formal parameters, in the order you list them, must differ in at least one position
- The following functions all have different formal parameter lists:

```
void functionOne(int x)
void functionTwo(int x, double y)
void functionThree(double y, int x)
int functionFour(char ch, int x, double y)
int functionFive(char ch, int x, string name)
```

- The following functions have the same formal parameter list:

```
void functionSix(int x, double y, char ch)
void functionSeven(int one, double u, char firstCh)
```

- **Function overloading**: creating several functions with the same name
- The **signature** of a function consists of the **function name** and its **formal parameter list**
- Two functions have different signatures if they have either different names or different formal parameter lists
- Note that the signature of a function does not include the **return type of the function**
- Correct function overloading:

```
void functionXYZ ()
void functionXYZ (int x, double y)
void functionXYZ (double one, int y)
void functionXYZ (int x, double y, char ch)
```

- Syntax error:

```
void functionABC(int x, double y)
int functionABC(int x, double y)
```

PROGRAMMING EXAMPLE

```
#include <iostream>
using namespace std;
#include <string>
int max (int x1, int x2);
double max (double x1, double x2);
float max (float x1, float x2);
void Swap (int &x1, int &x2);
void Swap (double &x1, double &x2);
void Swap (char &x1, char &x2);
void Swap (string &x1, string &x2);
int main ()
{ char c1,c2;
  c1 = 'a';
  c2 = 'b';
  int x,y;
  x=10;
  y = 15;
  double d1,d2,dm;
  d1 = 56.6;
  d2=100;
  string s1,s2;
  s1 = "AAAAAA";
  s2 = "BBBBBBB";
  Swap(s1,s2);
  cout << s1 << "\t" << s2 << endl;
  Swap(d1,d2);
  cout << d1 << "\t" << d2 << endl;
  Swap(c1,c2);
  cout << c1 << "\t" << c2 << endl;
  cout << max(x,y) << endl;;
  dm = max(d1,d2);
  cout << dm << endl;
  //cout << max(s,d1) << endl; Error
  return 0;}
int max (int x1, int x2)
{
  if (x1 < x2 )
    return x2;
  else
    return x1;
}
double max (double x1, double x2)
{
  if (x1 < x2 )
    return x2;
  else
    return x1;
}
```

```

float max (float x1, float x2)
{
    if (x1 < x2 )
        return x2;
    else
        return x1;
}
void Swap (int &x1, int &x2)
{
    int temp;
    temp =x1;
    x1=x2;
    x2 = temp;
}
void Swap (double &x1, double &x2)
{
    double temp;
    temp =x1;
    x1=x2;
    x2 = temp;
}
void Swap (char &x1, char &x2)
{
    char temp;
    temp =x1;
    x1=x2;
    x2 = temp;
}
void Swap (string &x1, string &x2)
{
    string temp;
    temp =x1;
    x1=x2;
    x2 = temp;
}

```

PROGRAM RESULTS

```

c:\ "D:\Overload\Debug\overload.exe"
BBBBBBB AAAAAA
100 56.6
b a
15
100
Press any key to continue

```