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Using comparator function with inbuilt sort function

```
String s = "bhavya";  
sort (s.begin(), s.end());  
cout << s;
```

The output of the above code will be aabhvy and this is sorted in the increasing order but what if we want to sort in decreasing order. Here we will use the custom comparator whose work is to compare.

```
bool cmp (char f, char s) {  
    return f > s;
```

```
}
```

```
sort (s.begin(), s.end(), cmp);  
cout << s;
```

Custom comparator

Output → yvhbaa

Note → In the custom comparator function, if  $f > s$ , then true will be returned else false will be returned.

We have used bool as return type as it is the part of syntax.



return f > s;

If f is greater than s, then true is returned & this means f will be placed first and then s will be placed.

Sorting vector with help of comparator function in decreasing order

```
vector<int> v {3, 4, 1, 2, 5};
```

```
sort(v.begin(), v.end(), cmp);
```

```
for (auto i : v) {
```

```
    cout << i << " ";
```

```
}
```

```
bool cmp (int a, int b) {
```

```
    return a > b; → Place a first if
```

```
}
```

it returns true else place b first.

Output

5 4 3 2 1

Note → The numbers which will go in the comparator function will be on the basis of the sorting algorithm.

HashMap

It is a data structure in which data is stored in the form of key-value pair.

Key

0

1

2

value

a

b

c

} Mappings  
are  
stored



Syntax

map <int, char> myMap;   
 ↗ data type of value  
 ↘ name of map  
 ↗ data type of key

Inserting values into map

myMap[0] = 'a';

↗ key ↘ value

Note → at, size, empty, insert, clear, erase, count are some functions that we use commonly.

auto keyword

This will automatically detect the data type of the variable.

```
vector<int>  
for (auto i : val) { vector<char>  
    cout << i << " "; vector<string>  
}
```