

# Chapter # 7

## Arrays & Strings



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# Objectives

- Array definitions.
- *Accessing array elements.*
- Arrays as class members.
- Arrays of objects.
- Strings.
- String input/output.



# Array Definition

## Syntax

```
Array_type array_name[array_size];
```



# Example



```
#include<iostream>
#include<conio.h>
using namespace std;
int main ()
{
int age[5]; //Definition
for(int i=0;i<5;i++)
{
cout<<"Enter an age:";
cin>>age[i]; //accessing
array elements
}
}
```

```
double total=0;
for(int i=0;i<5;i++)
{
total+=age[i]; //accessing array
elements
cout<<"\nYou entered:"
<<age[i]<<endl;
}
cout<<"\nAverage="<<total/5;
getche();
return 0;
}
```

# Array Initialization



```
#include<iostream>
#include<conio.h>
using namespace std;
int main ()
{
int days_month[12]=
{31,28,31,30,31,30,31,31,30,3
1,30,31}; //array initialization
int month,day,total;
cout<<"\nEnter month (1-12)";
cin>>month;
cout<<"\nEnter day(1-31)";
```

```
cin>>day;
total=day;
for(int i=0;i<month-1;i++)
total+=days_month[i];
cout<<"\nTotal days from start
of year="<<total<<endl;
getche();
return 0;
}
```

# Multidimensional Arrays

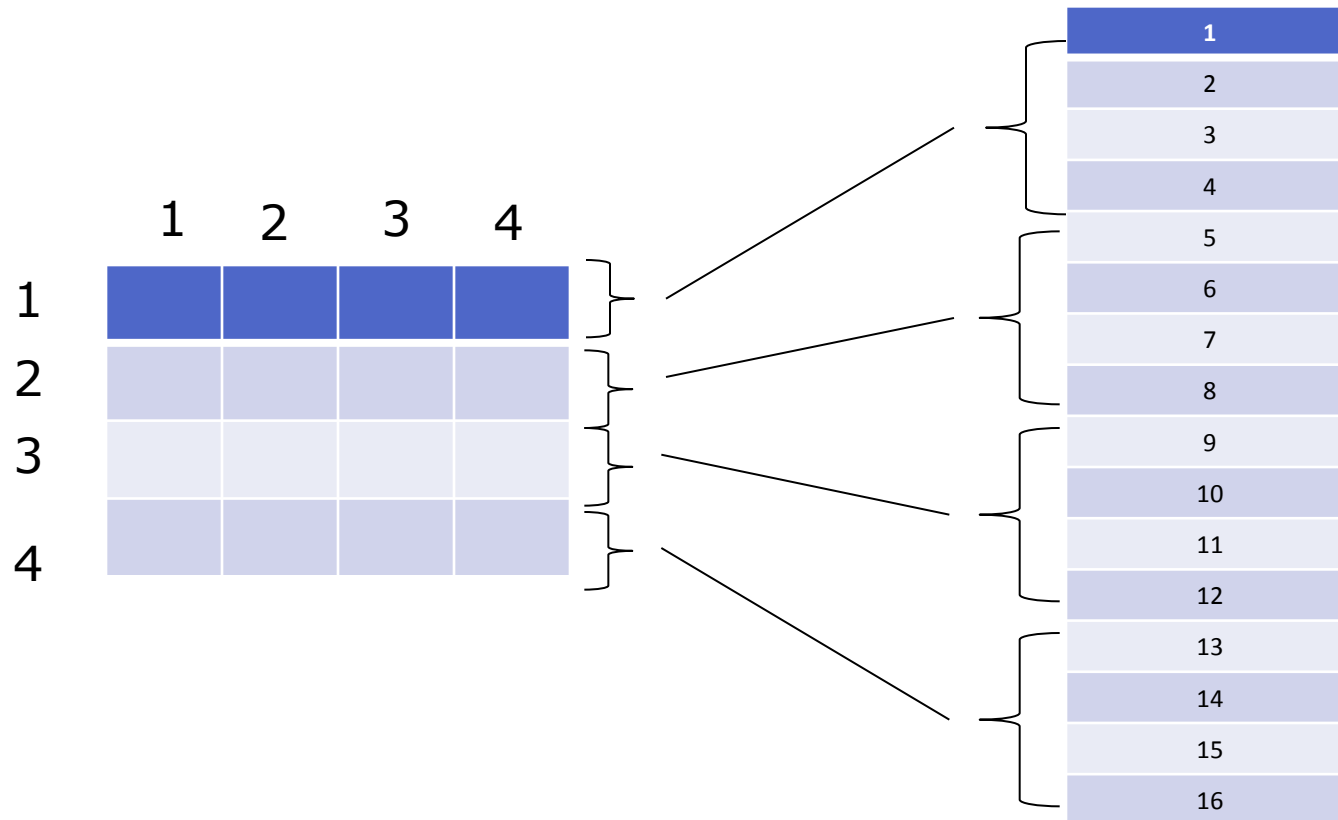


Syntax (nth dimensional array)

array\_type

array\_name[array\_size][array\_size]...[array\_size]

# Contd...



# Example



```
#include<iostream>
#include<conio.h>
using namespace std;
int main ()
{
    int record[5][4];
    for(int i=0;i<5;i++)
    {
        cout<<"Enter marks for student:
        "<<i+1;
        for(int j=0;j<4;j++)
        {
            cout<<"\nEnter subject
            "<<j+1<<" marks:";
            cin>>record[i][j];
        }
    }
}
```

```
cout<<"\n\t\t\tSubjects";
cout<<"\n\t\t1\t2\t3\t4"<<endl
;
cout<<"\n*****
*****
";
for(int i=0;i<5;i++)
{
    cout<<"\nStudent "<<i+1<<"\t";
    for(int j=0;j<4;j++)
        cout<<record[i][j]<<"\t";
    cout<<endl;
}
getche();
return 0;
}
```



# Passing Arrays to Functions



```
#include<iostream>
#include<conio.h>
using namespace std;
const int n=3,m=3;
void avg_marks(int[n][m]); //declaration
int main ()
{
int sub_marks[n][m];
for(int i=0;i<n;i++)
{
cout<<"Enter Student "<<i+1<<"
Marks\n";
for(int j=0;j<m;j++)
{
cout<<"Enter Subject "<<j+1<<"
marks\n";
cin>>sub_marks[i][j];
}
}
```

```
avg_marks(sub_marks); //function
call
getche();
return 0;
}
void avg_marks(int marks[n][m])
//function definition
{
int sum=0;
for(int i=0;i<n;i++)
{
cout<<"\nStudent "<<i+1<<endl;
for(int j=0;j<m;j++)
sum+=marks[i][j];
cout<<"Average="<<sum/m<<endl;
}
}
```

# Arrays of Structures



```
#include<iostream>
#include<conio.h>
using namespace std;
const int size=4;
struct emp
{
int age;
int salary;
};
int main ()
{
emp record[size];
for(int i=0;i<size;i++)
{
cout<<"\nEnter employee "<<i+1<<"
record\n";
```

```
cout<<"Enter age"<<endl;
cin>>record[i].age;
cout<<"Enter salary"<<endl;
cin>>record[i].salary;
}
for(int j=0;j<size;j++)
{
cout<<"Record of employee "<<j+1<<"
is"<<endl;
cout<<"Age="<<record[j].age<<"\nSalary="
"<<record[j].salary<<endl;
}
getche();
return 0;
}
```

# Array as Class Member Data



```
#include<iostream>
#include<conio.h>
using namespace std;
class stack
{
private:
int st[10];
int top;
public:
stack(): top(0)
{}
void push(int item)
{
st[++top]=item;
}
```

```
int pop()
{
return st[top--];
};
int main ()
{
stack s1;
s1.push(20);
s1.push(30);
s1.push(12);
cout<<"\n1st element=" <<s1.pop();
cout<<"\n2nd element="<<s1.pop();
getche();
return 0;
}
```

# Arrays of Objects



```
#include<iostream>
#include<conio.h>
using namespace std;
class Distance
{
private:
int feet;
float inches;
public:
void getdist()
{
cout<<"\n Enter feet:"; cin>>feet;
cout<<"\n Enter Inches:";
cin>>inches;
}
void showdist()
{ cout<<feet<<"'-"<<inches<<"\''"; }
};
```

```
int main ()
{
Distance dist[20]; //array of object
int n=0; char ans;
do
{
cout<<"Enter distance # "<<n+1;
dist[n++].getdist();
cout<<"\nDo you wish to continue:(y or n)";
cin>>ans;
}
while(ans!='n');
for(int i=0;i<n;i++)
{ cout<<"Distance # "<<i+1<<" is: ";
dist[i].showdist();
cout<<endl; }
getche();
return 0; }
```

# C-Strings



```
#include<iostream>
#include<conio.h>
using namespace std;
int main ()
{
const int MAX=80;
char str[MAX];
cout<<"Enter a string";
cin.get(str,MAX);
cout<<"You entered "<<str;
getche();
return 0;
}
```

# Reading Multiple Lines



```
#include<iostream>
#include<conio.h>
using namespace std;
int main ()
{
const int MAX=80;
char str[MAX];
cout<<"Enter a string";
cin.get(str,MAX,'$');
cout<<"You entered "<<str;
getche();
return 0;
}
```

# String Copy



```
#include<iostream>
#include<cstring>
#include<conio.h>
using namespace std;
int main ()
{
const int MAX=30;
char str[]="I am Nauman";
char str1[MAX];
strcpy(str1,str);
cout<<str1;
getche();
return 0;
}
```

# Arrays of Strings



```
#include<iostream>
#include<cstring>
#include<conio.h>
using namespace std;
int main ()
{
const int days=7;
const int MAX=10;
char day[days][MAX]=
{"Sunday", "Monday", "Tuesday", "Wedn
esday", "Thursday", "Friday"};
```

```
for(int j=0;j<days;j++)
cout<<day[j]<<endl;
getche();
return 0;
}
```



# String as Class Member



```
#include<iostream>
#include<conio.h>
using namespace std;
class part
{
char name[30];
int number;
public:
void setpart(char pname[],int
pnumber)
{
strcpy(name,pname);
number=pnumber;
}
void showpart()
{
```

```
cout<<"\nName:"<<name;
cout<<"\nNumber:"<<number;
}
};
int main ()
{
part p1,p2;
p1.setpart("Handle bolt",1);
p2.setpart("Start lever",2);
p1.showpart();
p2.showpart();
getche();
return 0;
}
```

# Standard C++ String Class



```
#include<iostream>
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
string s1("Man"); //initialize
string s2="Beast"; //initialize
string s3;
s3=s1; //assign
cout<<"s3="<<s3<<endl;
s3="Neither "+s1+" Nor ";
//concatenate
```

```
s3+=s2; //concatenate
cout<<"s3="<<s3<<endl
;
s1.swap(s2); //swap
cout<<s1<<" Nor "<<s2;
getche();
return 0;
}
```

# Input/output with String Objects



```
#include<iostream>
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
string name,nickname,address;
cout<<"Enter your name\n";
//read blanks
getline(cin,name);
cout<<"Enter address\n";
```

```
getline(cin,address,'$'); //read
multiple lines
cout<<"Enter your nick\n";
cin>>nickname;
cout<<"\nYour name ="<<name;
cout<<"\nYour nickname="
<<nickname;
cout<<"\nYour address="
<<address;
getche();
return 0;
}
```

# Finding String Objects



```
#include<iostream>
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
string s1="There are seven days in a
week";
int n;
n=s1.find("seven");
cout<<"Seven found at: "<<n<<endl;
```

```
n=s1.find_first_of("sdw");
cout<<"First of sdw found at: "
<<n<<endl;
n=s1.find_first_not_of("teio");
cout<<"First not of teio found at:
" <<n<<endl;
getche();
return 0;
}
```

# Modifying String Objects



```
#include<iostream>
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
string s1="There are seven days
in a week";
string s2("Interrupt");
string s3="Don't";
s1.erase(0,5);
```

```
s1.replace(10,14,"Four");
s3.insert(0,s2);
s2.append(3,'!');
getche();
return 0;
}
```

# Comparing String Objects



```
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
string s1="Ayesha";
string s2;
cout<<"Enter your name";
cin>>s2;
if(s1==s2)
cout<<"Equal\n";
else if(s1>s2)
cout<<"s1>s2\n";
else if(s1<s2)
cout<<"s1<s2\n";
```

```
int n;
n=s1.compare(0,3,s2,0,3);
//compare function
if(n==0)
cout<<"Equal\n";
else if(n>0)
cout<<"come after\n";
else if(n<0)
cout<<"come before\n";
cout<<s2.substr(0,2);
getche();
return 0;
}
```

# Accessing Characters in String Objects



```
#include<iostream>
#include<conio.h>
#include<string>
using namespace std;
int main ()
{
char ch[80];
string s1;
cout<<"Enter a word\n";
cin>>s1;
int l=s1.length();
```

```
for(int j=0;j<l;j++)
cout<<s1[j]; //cout<<s1.at(j)
s1.copy(ch,l,0);
ch[l]=0;
cout<<"\nCharacter array="<<ch;
getche();
return 0;
}
```