

UNIVERSITY OF ENGINEERING AND TECHNOLOGY (NAROWAL CAMPUS)



Object-Oriented Programming Lab Manual

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Topics: Unions, Classes and Objects,
Constructor and Destructor, Default Constructor and
Separate interface and implementation

Lab Manual

(Object-Oriented Programming Lab)

- **Task 1:**

Create a union and union variable in a C++ program:

Program:

```
1  #include <iostream>
2  using namespace std;
3  union casualtyMeter{
4      int initialCasualties;
5      int update;
6      int finalCasualties;
7  };
8  int main(){
9      casualtyMeter earthQuick;
10     earthQuick.initialCasualties = 10;
11     cout<<"Number of Casualties at initial is:      "<<earthQuick.initialCasualties<<endl;
12     earthQuick.update = 15;
13     cout<<"Number of Casualties at 1300 Hours is:    "<<earthQuick.update<<endl;
14     earthQuick.update = 20;
15     cout<<"Number of Casualties at 1600 Hours is:    "<<earthQuick.update<<endl;
16     earthQuick.update = 25;
17     cout<<"Number of Casualties at 1900 Hours is:    "<<earthQuick.update<<endl;
18     earthQuick.finalCasualties = earthQuick.update;
19     cout<<"Number of Casualties at Final is:        "<<earthQuick.finalCasualties<<endl;
20     return 0;
21 }
22
```

Output:

```
Number of Casualties at initial is:      10
Number of Casualties at 1300 Hours is:    15
Number of Casualties at 1600 Hours is:    20
Number of Casualties at 1900 Hours is:    25
Number of Casualties at Final is:         25
```

```
D:\UET Narowal\2nd Semester\Object Oriented Programming\Lab\OOP Lab\x64\Debug\OOP Lab.exe (process 8956) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

- **Task 2:**

Create a class and its data member and member functions, also create the object of the class in the C++ program

Program:

```
1 #include <iostream>
2 #include <string>
3 using namespace std;
4 class player
5 {
6 private:
7     string name, country;
8     int age, t20, odi, rank;    // t20 = Runs in T20, odi = Runs in ODI
9     float height, weight;
10
11 public:
12     player(string Name = "", string Country = "", int Age = 0, int T20 = 00, int Odi = 00, int Rank = 00, int Height = 00, int Weight = 00) {
13         name = Name;
14         country = Country;
15         age = Age;
16         t20 = T20;
17         odi = Odi;
18         rank = Rank;
19         height = Height;
20         weight = Weight;
21     }
22     void getInfo();
23     void printInfo();
24 };
25 int main()
26 {
27     player babarAzam;
28     babarAzam.getInfo();
29     babarAzam.printInfo();
30     player abDeville("Ab Deviller", "South Africa");
31     player viratKholi("Virat Kholi", "India", 34, 240, 525);
32     abDeville.printInfo();
33     viratKholi.printInfo();
34     return 0;
35 }
36
37 void player :: getInfo()
38 {
39     cout << " --: Player Information Entry :-- " << endl;
40     cout << "Enter Player Name: ";
41     getline(cin, name);
42     cout << "Enter Player Country: ";
43     getline(cin, country);
44     cout << "Enter Player Rank: ";
45     cin >> rank;
46     cout << "Enter Player Age: ";
47     cin >> age;
48     cout << "Enter Player Height: ";
49     cin >> height;
50     cout << "Enter Player Weight: ";
51     cin >> weight;
52     cout << "Enter Player T20 Runs: ";
53     cin >> t20;
54     cout << "Enter Player ODI Runs: ";
55     cin >> odi;
56 }
57 void player :: printInfo(){
58     cout << "Player Name: " << name << endl;
59     cout << "Player Country: " << country << endl;
60     cout << "Player Rank: " << rank << endl;
61     cout << "Player Age: " << age << endl;
62     cout << "Player Height: " << height << endl;
63     cout << "Player Weight: " << weight << endl;
64     cout << "Player T20 Runs: " << t20 << endl;
65     cout << "Player ODI Runs: " << odi << endl;
66 }
```

Output:

```
--: Player Information Entry :--
Enter Player Name: Babar Azam
Enter Player Country: Pakistan
Enter Player Rank: 1
Enter Player Age: 29
Enter Player Height: 5.9
Enter Player Weight: 67.9
Enter Player T20 Runs: 2215
Enter Player ODI Runs: 1904
--: Player Information :--
Player Name: Babar Azam
Player Country: Pakistan
Player Rank: 1
Player Age: 29
Player Height: 5.9
Player Weight: 67.9
Player T20 Runs: 2215
Player ODI Runs: 1904
--: Player Information :--
Player Name: Ab Deviller
Player Country: South Africa
Player Rank: 0
Player Age: 0
Player Height: 0
Player Weight: 0
Player T20 Runs: 0
Player ODI Runs: 0
--: Player Information :--
Player Name: Virat Kholi
Player Country: India
Player Rank: 0
Player Age: 34
Player Height: 0
Player Weight: 0
Player T20 Runs: 240
Player ODI Runs: 525

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To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```

• Task 3:

Create a class that contains a constructor and destructor in its definition

Program:

```
1  #include <iostream>
2  using namespace std;
3  class Data
4  {
5  private:
6      int *intptr = NULL, length = 0;
7
8  public:
9      Data(int n)
10     {
11         length = n;
12         intptr = new int[length];
13     }
14     void getData();
15     void search(int x);
16     void printData();
17     ~Data()
18     {
19         delete[] intptr;
20         intptr = NULL;
21         cout << endl << "CLEARED";
22     }
23 };
24 int main()
25 {
26     int a;
27     cout << "Enter Length/Quantity of data: ";
28     cin >> a;
29     Data d(a);
30     d.getData();
31     cout << "Enter a value to search in given data: ";
32     cin >> a;
33     d.search(a);
34     cout << " --: Data :-- " << endl;
35     d.printData();
36     return 0;
37 }
```

```

38 void Data ::getData()
39 {
40     for (int i = 0; i < length; i++)
41     {
42         cout << "Enter " << i + 1 << " Value: ";
43         cin >> *(intptr + i);
44     }
45 }
46 void Data ::search(int x)
47 {
48     for (int i = 0; i < length; i++)
49     {
50         if (x == *(intptr + i))
51         {
52             cout << "Yes it is in our record" << endl;
53             return;
54         }
55     }
56     cout << "No it is not in out record" << endl;
57     return;
58 }
59 void Data ::printData()
60 {
61     for (int i = 0; i < length; i++)
62     {
63         cout << *(intptr + i) << " ";
64     }
65 }

```

Output:

```

Enter Length/Quantity of data: 4
Enter 1 Value: 947
Enter 2 Value: 901
Enter 3 Value: 1904
Enter 4 Value: 2215
Enter a value to search in given data: 2583
No it is not in out record
--: Data :--
947 901 1904 2215
CLEARED
D:\UET Narowal\2nd Semester\Object Oriented Programming\Lab\OOP Lab\x64\Debug\OOP Lab.exe (process 13412) exited with code 0.
To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .

```

• Task 4:

Create a class that contains the default constructor in its definition in the C++ program

Program:

```
1  #include <iostream>
2  #include <string>
3  using namespace std;
4  class soldier{
5  private:
6      string name, fname, battalion, rank, course, idNumber, ww; //fname = Father Name , ww = War Wounded
7      int age;
8      float height, weight;
9  public:
10     soldier(string Name = "Muhammad Abdullah", string Fname = "Zahid Mehmood",
11             string Rank = "Lieutenant Colonel", string Battalion = "4th Commando Battalion",
12             string Course = "17th PMA L/C", string Id = "PA-1904", int Age = 30, double Height = 5.9, double Weight = 75.7, string WW = "Yes"){
13         name = Name;
14         fname = Fname;
15         rank = Rank;
16         battalion = Battalion;
17         course = Course;
18         idNumber = Id;
19         age = Age;
20         height = Height;
21         weight = Weight;
22         ww = WW;
23     }
24     void getData();
25     void printData();
26 };
27 int main(){
28     soldier Abdullah;
29     Abdullah.printData();
30     Abdullah.getData();
31     Abdullah.printData();
32     return 0;
33 }

34 void soldier :: getData(){
35     cout<<" --: Enter Soldier Information :-- "<<endl;
36     cout<<"Enter Soldier Name: ";
37     getline(cin>>ws,name);
38     cout<<"Enter Soldier Father Name: ";
39     getline(cin>>ws,fname);
40     cout<<"Enter Soldier Age: ";
41     cin>>age;
42     cout<<"Enter Soldier rank: ";
43     getline(cin>>ws,rank);
44     cout<<"Enter Soldier Army Number: ";
45     getline(cin>>ws,idNumber);
46     cout<<"Enter Soldier Battalion: ";
47     getline(cin>>ws,battalion);
48     cout<<"Enter Soldier Course: ";
49     getline(cin>>ws,course);
50     cout<<"Enter Soldier Height: ";
51     cin>>height;
52     cout<<"Enter Soldier Weight: ";
53     cin>>weight;
54     cout<<"Enter Soldier War Wounded Status: ";
55     getline(cin>>ws,ww);
56 }
57 void soldier :: printData(){
58     cout<<" --: Soldier Information :--"<<endl;
59     cout<<"Name: "<<name<<endl;
60     cout<<"Father Name: "<<fname<<endl;
61     cout<<"Age: "<<age<<endl;
62     cout<<"Rank: "<<rank<<endl;
63     cout<<"Army Number: "<<idNumber<<endl;
64     cout<<"Battalion: "<<battalion<<endl;
65     cout<<"Course: "<<course<<endl;
66     cout<<"Height: "<<height<<endl;
67     cout<<"Weight: "<<weight<<endl;
68     cout<<"War Wounded: "<<ww<<endl;
69 }
```

Output:

```
--: Solider Information :--
Name:      Muhammad Abdullah
Father Name: Zahid Mehmood
Age:       30
Rank:      Lieutenant Colonel
Army Number: PA-1904
Battalion: 4th Commando Battalion
Course:    17th PMA L/C
Height:    5.9
Weight:    75.7
War Wounded: Yes
--: Enter Solider Information :--
Enter Solider Name: Abdullah
Enter Solider Father Name: Zahid
Enter Solider Age: 19
Enter Solider rank: Captain
Enter Solider Army Number: PA-525
Enter Solider Battalion: Baloch Regiment
Enter Solider Course: TCC-34
Enter Solider Height: 5.9
Enter Solider Weight: 69
Enter Solider War Wounded Status: No
--: Solider Information :--
Name:      Abdullah
Father Name: Zahid
Age:       19
Rank:      Captain
Army Number: PA-525
Battalion: Baloch Regiment
Course:    TCC-34
Height:    5.9
Weight:    69
War Wounded: No

D:\UET Narowal\2nd Semester\Object Oriented Programming\Lab\OOP Lab\x64\Debug\OOP Lab.exe (process 9968) exited with code 0.
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Press any key to close this window . . .
```

• Task 5:

Create a class that has a separate interface and implementation in the C++ program

Separate File:

```
1  #ifndef Task5file
2      #define Task5file
3
4      #include <string>
5  class player
6  {
7      private:
8          std::string name, country;
9          int age, t20, odi, rank; // t20 = Runs in T20, odi = Runs in ODI
10         float height, weight;
11
12     public:
13         player(std::string n = "", std::string c = "", int a= 0, int t2= 00, int od= 00,int r=00, int h= 00, int w= 00);
14         void getInfo();
15         void printInfo();
16     };
17
18     #endif
```

Program:

```
1  #include <iostream>
2  #include "Task5File.h"
3  using namespace std;
4  int main()
5  {
6      player viratKholi;
7      viratKholi.getInfo();
8      viratKholi.printInfo();
9      return 0;
10 }
11 player::player(string Name, string Country, int Age, int T20, int Odi ,int Rank, int Height, int Weight) {
12     name = Name;
13     country = Country;
14     age = Age;
15     t20 = T20;
16     odi = Odi;
17     rank = Rank;
18     height = Height;
19     weight = Weight;
20 }
21 void player ::getInfo()
22 {
23     cout << " --: Player Information Entry :-- " << endl;
24     cout << "Enter Player Name: ";
25     getline(cin, name);
26     cout << "Enter Player Country: ";
27     getline(cin, country);
28     cout << "Enter Player Rank: ";
29     cin >> rank;
30     cout << "Enter Player Age: ";
31     cin >> age;
32     cout << "Enter Player Height: ";
33     cin >> height;
34     cout << "Enter Player Weight: ";
35     cin >> weight;
36     cout << "Enter Player T20 Runs: ";
37     cin >> t20;
38     cout << "Enter Player ODI Runs: ";
39     cin >> odi;
40 }
41 void player::printInfo()
42 {
43     cout << "Player Name:      " << name << endl;
44     cout << "Player Country:  " << country << endl;
45     cout << "Player Rank:     " << rank << endl;
46     cout << "Player Age:      " << age << endl;
47     cout << "Player Height:   " << height << endl;
48     cout << "Player Weight:   " << weight << endl;
49     cout << "Player T20 Runs: " << t20 << endl;
50     cout << "Player ODI Runs: " << odi << endl;
51 }
```


Output:

```
--: Player Information Entry :--
Enter Player Name: Babar Azam
Enter Player Country: Pakistan
Enter Player Rank: 1
Enter Player Age: 29
Enter Player Height: 5.
Enter Player Weight: 76
Enter Player T20 Runs: 2215
Enter Player ODI Runs: 1904
Player Name: Babar Azam
Player Country: Pakistan
Player Rank: 1
Player Age: 29
Player Height: 5
Player Weight: 76
Player T20 Runs: 2215
Player ODI Runs: 1904

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To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .
```
