KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY (KIIT)

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OBJECT ORIENTED PROGRAMMING

LAB 6

- Name :HITU RAJ
- Roll no. :2005025
- Branch :CSE


```
/*Q1.Create a class student which stores name_025, roll_025 number a
nd age_025 of a student. Derive a class
test from student class, which stores marks in 5 subjects. Input and
 display the details of
a student.*/
#include <iostream>
#include <string.h>
using namespace std;
class student
{
    char name_025[50];
    int roll_025, age_025;

public:
    void inputd(char *n, int rol, int ag)
    {
```

```
        strcpy(name_025, n);
        roll_025 = rol;
        age_025 = ag;
    }
    void displayd()
    {

        cout << "name , roll , age is" << name_025 <<" " << roll_025
<<" " << age_025<<"\n";
    }

};
class test : public student
{
    int marks[5];

public:
    void inputm(int *mark)
    {
        for (int i = 0; i < 5; i++)
        {
            marks[i] = *mark++;
        }
    }
    void displaym()
    {

        cout << "marks in 5 subject is" <<"\n";
        for (int i = 0; i < 5; i++)
        {
            cout<<marks[i]<<" ";
        }

    }
};
int main()
{
    int roll_025, age_025, marks[5];
    char name_025[100];

    cout << "enter name_025 roll_025 age_025 : ";
    gets(name_025);
    cin >> roll_025>>age_025;
```

```cpp
    cout << "enter the marks in 5 subject";
    for (int i = 0; i < 5; i++)
    {
        cin >> marks[i];
    }

    //CREATING OBJECT OF ONLY THE DERIVED CLASS
    test t;
    t.inputd(name_025, roll_025, age_025);
    t.inputm(marks);

    cout << "the entered details of student are\n";
    t.displayd();

    t.displaym();

    return 0;
}
```

OUTPUT-1

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q1_STUD_.cpp -o q1_STUD_ } ; i
f ($?) { .\q1_STUD_ }
enter name_025 roll_025 age_025 : Hitu Raj
20050254
20
enter the marks in 5 subject98
97
99
94
93
the entered details of student are
name , roll , age isHitu Raj 20050254 20
marks in 5 subject is
98 97 99 94 93
PS D:\my codes\OOPS\lab6_inheritance>
```

```
/*Q2.Extend the program i. to derive a class from result from class
‘test’ which includes
member function to calculate total marks and percentage of a student
. Input the data for a
student and display his/her grade..*/
#include <iostream>
#include <string.h>
using namespace std;
class student
{
    char name_025[50];
    int roll_025, age_025;

public:
    void inputd(char *n, int rol, int ag)
    {
        strcpy(name_025, n);
        roll_025 = rol;
        age_025 = ag;
    }
    void displayd()
    {

        cout << "name_025 , roll_025 , age_025 is" << name_025 << "
" << roll_025 << " " << age_025 << "\n";
        cout << "\n.....................................................
.....\n";
    }
};
class test : public student
{

public:
    int marks[5];
    void inputm(int *mark)
    {
        for (int i = 0; i < 5; i++)
        {
            marks[i] = *mark++;
        }
    }
    void displaym()
```

```
    {

        cout << "marks in 5 subject is"
             << "\n";
        for (int i = 0; i < 5; i++)
        {
            cout << marks[i] << " ";
        }
        cout << "\n";
        cout << "\n.....
.....\n";
    }
};
class result : public test
{
    float perc;
    int total_marks = 0;
    char grade;

public:
    void gradecal()
    {

        for (int i = 0; i < 5; i++)
        {
            total_marks = total_marks + marks[i];
        }
        perc = total_marks / 5.0;
        if (perc >= 90)
        {
            cout << "grade O";
            grade = 'O';
        }
        else if (perc >= 80)
        {
            cout << "grade A";
            grade = 'A';
        }
        else if (perc >= 60)
        {
            cout << "grade B";
            grade = 'B';
        }
```

```
        else if (perc >= 40)
        {
            cout << "grade C";
            grade = 'C';
        }
        else
        {
            cout << "you are fail";
            grade = 'F';
        }
    }
};
int main()
{
    int roll_025, age_025, marks[5];
    char name_025[100];

    cout << "enter name_025 roll_025 age_025 : ";
    gets(name_025);
    cin >> roll_025 >> age_025;

    cout << "enter the marks in 5 subject";
    for (int i = 0; i < 5; i++)
    {
        cin >> marks[i];
    }

    //CREATING OBJECT OF ONLY THE DERIVED CLASS
    result t;
    t.inputd(name_025, roll_025, age_025);
    t.inputm(marks);

    cout << "the entered details of student are\n";
    t.displayd();

    t.displaym();
    t.gradecal();

    return 0;
}
```

OUTPUT-2

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ Q2_PERC.CPP -o Q2_PERC } ; if
($?) { .\Q2_PERC }
enter name_025 roll_025 age_025 : Hitu Raj
2005025
20
enter the marks in 5 subject99
98
96
93
92
the entered details of student are
name_025 , roll_025 , age_025 isHitu Raj 2005025 20

.....
marks in 5 subject is
99 98 96 93 92

.....
grade O
PS D:\my codes\OOPS\lab6_inheritance>
```

```cpp
/*Q3.Extend the program ii. to include a class sports, which stores
the marks_025 in sports activity. Derive the result class from the c
lasses ‘test’ and ‘Activities’. Calculate the total marks_025
and percentage of a student.*/

#include <iostream>
#include <string.h>
using namespace std;
class student
{
    char name_025[50];
    int roll_025, age_025;

public:
    void inputd(char *n, int rol, int ag)
    {
        strcpy(name_025, n);
        roll_025 = rol;
        age_025 = ag;
```

```
    }
    void displayd()
    {

        cout << "name_025 , roll_025 , age_025 is" << name_025 << "
" << roll_025 << " " << age_025 << "\n";
        cout << "\n.....................................................
.............\n";
    }
};
class test : virtual public student
{

public:
    int marks_025[3];
    void inputm(int *mark)
    {
        for (int i = 0; i < 3; i++)
        {
            marks_025[i] = *mark++;
        }
    }
    void displaym()
    {

        cout << "marks_025 in 3 subject is"
             << "\n";
        for (int i = 0; i < 3; i++)
        {
            cout << marks_025[i] << " ";
        }
        cout << "\n";
        cout << "\n.....................................................
.............\n";
    }
};
class sport : virtual public student
{

public:
    int activity[2];
    void inputa(int *activ)
    {
```

```
        for (int i = 0; i < 3; i++)
        {
            activity[i] = *activ++;
        }
    }
    void displaya()
    {

        cout << "marks_025 in Activity  is"
             << "\n";
        for (int i = 0; i < 2; i++)
        {
            cout << activity[i] << " ";
        }
        cout << "\n";
        cout << "\n.....
.....\n";
    }
};
class result : public test,public sport
{
    float perc;
    int total_marks = 0;
    char grade;

public:
    void gradecal()
    {

        for (int i = 0; i < 3; i++)
        {
            total_marks = total_marks + marks_025[i];
        }
        for (int i = 0; i < 2; i++)
        {
            total_marks = total_marks + activity[i];
        }
        perc = total_marks / 5.0;
        if (perc >= 90)
        {
            cout << "grade O";
            grade = 'O';
        }
```

```
        else if (perc >= 80)
        {
            cout << "grade A";
            grade = 'A';
        }
        else if (perc >= 60)
        {
            cout << "grade B";
            grade = 'B';
        }
        else if (perc >= 40)
        {
            cout << "grade C";
            grade = 'C';
        }
        else
        {
            cout << "you are fail";
            grade = 'F';
        }
    }
};
int main()
{
    int roll_025, age_025, marks_025[3],activ_marks[2];
    char name_025[100];

    cout << "enter name_025 roll_025 age_025 : ";
    gets(name_025);
    cin >> roll_025 >> age_025;

    cout << "enter the marks_025 in 3 subject";
    for (int i = 0; i < 3; i++)
    {
        cin >> marks_025[i];
    }
     cout << "enter the marks_025 in 2 Activity ";
    for (int i = 0; i < 2; i++)
    {
        cin >> activ_marks[i];
    }

    //CREATING OBJECT OF ONLY THE DERIVED CLASS
```

```
    result t;
    t.inputd(name_025, roll_025, age_025);
    t.inputm(marks_025);
    t.inputa(activ_marks);

    cout << "the entered details of student are\n";
    t.displayd();

    t.displaym();
    t.displaya();
    t.gradecal();

    return 0;
}
```

OUTPUT-3

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q3_sport.cpp -o q3_sport } ; i
f ($?) { .\q3_sport }
enter name_025 roll_025 age_025 : Hitu Raj
2005025
20
enter the marks_025 in 3 subject99
94
91
enter the marks_025 in 2 Activity 95
92
the entered details of student are
name_025 , roll_025 , age_025 isHitu Raj 2005025 20

.............................................................
marks_025 in 3 subject is
99 94 91

.............................................................
marks_025 in Activity  is
95 92

.............................................................
grade O
PS D:\my codes\OOPS\lab6_inheritance>
```

```
/*Q4.Create a class ‘shape’. Derive three classes from it: Circle, T
riangle and Rectangle. Include the relevant data members and functio
ns in all the classes. Find the area of each
shape and display it.*/

#include <iostream>
```

```cpp
#include <string.h>
#include<math.h>
using namespace std;
class area
{
public:
    void acircle(int r_025)
    {
        cout << "area of circle is " << 3.14 * r_025 * r_025 << "squ
nit";
    }
    void arectangle(int l_025, int b_025)
    {
        cout << "area of rectangle is " << l_025 * b_025 << "squnit"
;
    }
    void atriangle(int a, int b_025, int c)
    {
        float s = (a + b_025 + c) / 2.0 ;
        float area = pow((s*(s-a)*(s-b_025)*(s-c)),1.0/2);
        cout << "area of triangle is " <<area<< " squnit";
    }
};
class circle : public area
{

public:
    int r_025;
    void inputc(int r_025)
    {
        r_025 = r_025;
    }
};
class rectangle : public area
{
    int l_025, b_025;

public:
    int r_025;
    void inputr(int l_025, int b_025)
    {
        ;
    }
```

```
};
class triangle : public area
{

public:
    int r_025;
    void inputc(int r_025)
    {
        r_025 = r_025;
    }
};
int main()
{ int n;
    cout << "Press 1 to calculate the area of circle\n";
    cout << "Press 2 to calculate the area of rectangle\n";
    cout << "Press 3 to calculate the area of traingle\n";
    cin>>n;

    switch (n)
    {
    case 1:
    {
        circle t;
        int r_025;
        cout << "enter the radius";
        cin >> r_025;

        t.acircle(r_025);
        break;
    }
    case 2:
    {
        int l_025, b_025;
        rectangle t;
        cout << "enter the length and breadth";
        cin >> l_025 >> b_025;
        t.arectangle(l_025, b_025);
        break;
    }
    case 3:
    {
        triangle t;
        int a, b_025, c;
```

```
        cout << "enter the  3 sides";
        cin >> a >> b_025 >> c;
        t.atriangle(a,b_025,c);
        break;
    }

    default:
        break;
    }

    return 0;
}
```

OUTPUT-4

```
Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q4_shape.cpp -o q4_shape } ; i
f ($?) { .\q4_shape }
Press 1 to calculate the area of circle
Press 2 to calculate the area of rectangle
Press 3 to calculate the area of traingle
1
enter the radius32
area of circle is 3215.36squnit
PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q4_shape.cpp -o q4_shape } ; i
f ($?) { .\q4_shape }
Press 1 to calculate the area of circle
Press 2 to calculate the area of rectangle
Press 3 to calculate the area of traingle
2
enter the length and breadth3
4
area of rectangle is 12squnit
PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q4_shape.cpp -o q4_shape } ; i
f ($?) { .\q4_shape }
Press 1 to calculate the area of circle
Press 2 to calculate the area of rectangle
Press 3 to calculate the area of traingle
3
enter the  3 sides3
4
5
area of triangle is 6 squnit
```

/*Q5.Create a class which stores employee name,id and salary Derive two classes from
‘Employee’ class: ‘Regular’ and ‘Part-
Time’. The ‘Regular’ class stores DA, HRA and

```
basic salary. The ‘Part-
Time’ class stores the number of hours and pay*/
#include <iostream>
#include <string.h>
using namespace std;
class employee
{
    char name_025[20];
    int id_025;

protected:
    float sal_025;

public:
    void input(char *nam, int ide)
    {

        strcpy(name_025, nam);
        id_025 = ide;
    }
    void display()
    {
        cout << "\nname of employee: " << name_025;
        cout << "\nid of employee: " << id_025;
    }
};
class regular : public employee
{
    int basic_sal_025;
    float da, hra, sal_025;

public:
    void tot_sal(int basic_sal1)
    {
        basic_sal_025 = basic_sal1;

        da = 0.8 * basic_sal_025;
        hra = 0.1 * basic_sal_025;
        sal_025 = basic_sal_025 + da + hra;
    }
    void displayem()
    {
         display();
```

```
        cout << "the total salary of the employee is " << sal_025;
    }
};
class part_time : public employee
{
    int hours_025, pay_per_hour_025, sal_025;

public:
    void tot_sal(int hr, int pph)
    {
        hours_025 = hr;
        pph = pay_per_hour_025;

        sal_025 = hours_025 * pay_per_hour_025;
    }
    void displaypt()
    {    display();
        cout << "\nsalary per hours_025: " << sal_025;
    }
};
int main()
{
    int basic_sal_025, hours_025, pay_per_hour_025, n,id_025;
    char name_025[100];
    cout << "press1 if u have employee\n";
    cout << "press 2 if u have partime employee\n ";
    cin >> n;
    switch (n)
    {
    case 1:regular r;
        cout << "\nfor regular employees: ";
         cout << "\nenter the name_025 and id_025 of employee respec
tively: ";
       cin>>name_025>>id_025;
        r.input(name_025,id_025);
        cout << "\nenter the basic salary of employee: ";
        cin >> basic_sal_025;
        r.tot_sal(basic_sal_025);
        r.displayem();
        break;

    case 2:
        cout << "\nfor part-time employees: ";
```

```
        cout << "\nenter the name_025 and id_025 of employee respect
ively: ";
       cin>>name_025>>id_025;
        part_time p;
        p.input(name_025,id_025);
        cout << "\nenter the total no. of working hours_025 of emmpl
oyee and pay per hour:";
        cin >> hours_025 >> pay_per_hour_025;
        p.tot_sal(hours_025, pay_per_hour_025);
        p.displaypt();
        break;
    default:
        break;
    }

    return 0;
}
```

OUTPUT-5

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL                                  Code

Windows PowerShell
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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q5_employw.cpp -o q5_employw }
 ; if ($?) { .\q5_employw }
press1 if u have employee
press 2 if u have partime employee
 1

for regular employees:
enter the name_025 and id_025 of employee respectively: Ramesh
29203

enter the basic salary of employee: 23000

name of employee: Ramesh
id of employee: 29203the total salary of the employee is 43700
PS D:\my codes\OOPS\lab6_inheritance> cd "d:\my codes\OOPS\lab6_inheritance\" ; if ($?) { g++ q5_employw.cpp -o q5_employw }
 ; if ($?) { .\q5_employw }
press1 if u have employee
press 2 if u have partime employee
 2

for part-time employees:
enter the name_025 and id_025 of employee respectively: HIMESHIYA
23223

enter the total no. of working hours_025 of emmployee and pay per hour:32
2000

name of employee: HIMESHIYA
id of employee: 23223
salary per hours_025: 4096
PS D:\my codes\OOPS\lab6_inheritance>

Ln 12, Col 11  Spaces: 4  UTF-8  CRLF  C++  Win32
```
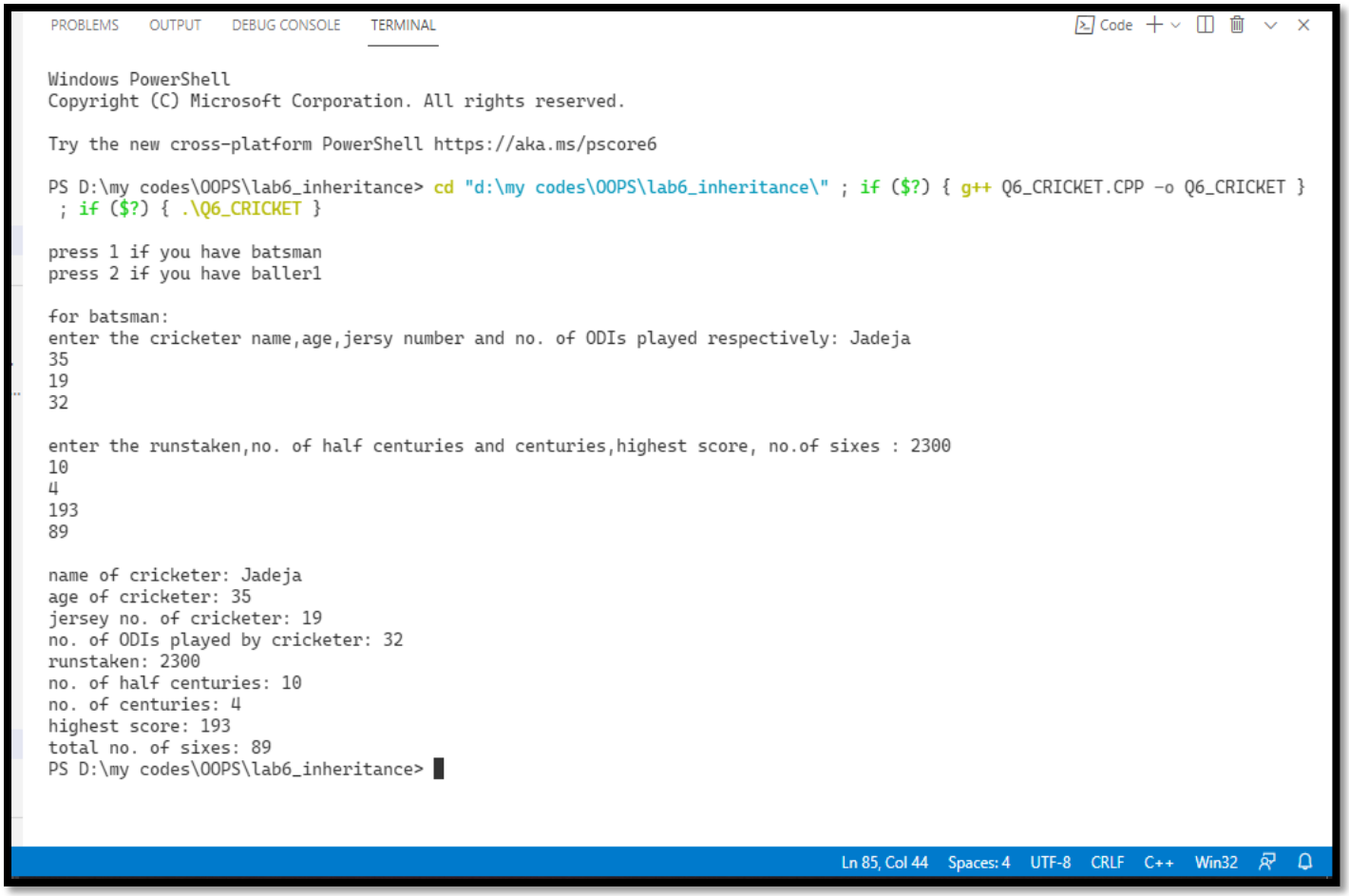

```
/*Q6. Cricketer problem(Hierarchial inheritance)*/
#include <iostream>
#include <string.h>
using namespace std;
class cricketer
{
    char name_025[20];
    int age_025;
    int jursey_no_025;
    int odi_025;

public:
    void input(char *name1, int age1, int jn1, int odi1)
    {
        strcpy(name_025, name1);
        age_025 = age1;
        jursey_no_025 = jn1;
        odi_025 = odi1;
    }
    void display()
    {
        cout << "\nname of cricketer: " << name_025;
        cout << "\nage of cricketer: " << age_025;
        cout << "\njersey no. of cricketer: " << jursey_no_025;
        cout << "\nno. of ODIs played by cricketer: " << odi_025;
    }
};
class batsman : public cricketer
{
    int run_taken_025, high_score_025, century_025, high_score_025,
no_of_six_025;

public:
    void input(int rt1, int hc1, int c1, int hs1, int ns1)
    {
        run_taken_025 = rt1;
        high_score_025 = hc1;
        century_025 = c1;
        high_score_025 = hs1;
        no_of_six_025 = ns1;
    }
    void display()
```

```
    {
        cricketer::display();
        cout << "\nrunstaken: " << run_taken_025;
        cout << "\nno. of half centuries: " << high_score_025;
        cout << "\nno. of centuries: " << century_025;
        cout << "\nhighest score: " << high_score_025;
        cout << "\ntotal no. of sixes: " << no_of_six_025;
    }
};
class baller : public cricketer
{
    char type_025[5];
    int wiket_taken_025, speed_025;

public:
    void input(char *type1, int wt1, int s1)
    {
        strcpy(type_025, type1);
        wiket_taken_025 = wt1;
        speed_025 = s1;
    }
    void display()
    {
        cricketer::display();
        cout << "\nballer type_025: " << type_025;
        cout << "\ntotal no. of wickets taken: " << wiket_taken_025;
        cout << "\nspeed of baller: " << speed_025 << "km/h";
    }
};
int main()
{
    int age_025, jursey_no_025, odi_025, run_taken_025, high_score_0
25, century_025, high_score_025, no_of_six_025, wiket_taken_025, spe
ed_025, n;
    char name_025[50], type_025[10];

    batsman bt;
    baller bl;
    cout << "\npress 1 if you have batsman";
    cout << "\npress 2 if you have baller";
    cin >> n;
    switch (n)
    {
```

```
    case 1:
        cout << "\nfor batsman: ";
        cout << "\nenter the cricketer'speed_025 name_025,age_025,je
rsy number and no. of ODIs played respectively: ";
        cin >> name_025 >> age_025 >> jursey_no_025 >> odi_025;

        cout << "\nenter the runstaken,no. of half centuries and cen
turies,highest score, no.of sixes : ";
        cin >> run_taken_025 >> high_score_025 >> century_025 >> hig
h_score_025 >> no_of_six_025;
        bt.cricketer::input(name_025, age_025, jursey_no_025, odi_02
5);
        bt.input(run_taken_025, high_score_025, century_025, high_sc
ore_025, no_of_six_025);

        bt.display();

        break;

    case 2:
        cout << "\n\nfor baller: ";
        cout << "\nenter the cricketer'speed_025 name_025,age_025,je
rsy number and no. of ODIs played respectively: ";
        cin >> name_025 >> age_025 >> jursey_no_025 >> odi_025;

        cout << "\nenter the type_025 of baller,total no. of wickets
 taken and speed of baller:";
        cin >> type_025 >> wiket_taken_025 >> speed_025;
        bt.cricketer::input(name_025, age_025, jursey_no_025, odi_02
5);
        bl.input(type_025, wiket_taken_025, speed_025);
        bl.display();

    default:
        break;
    }

    return 0;
}
```

OUTPUT-6



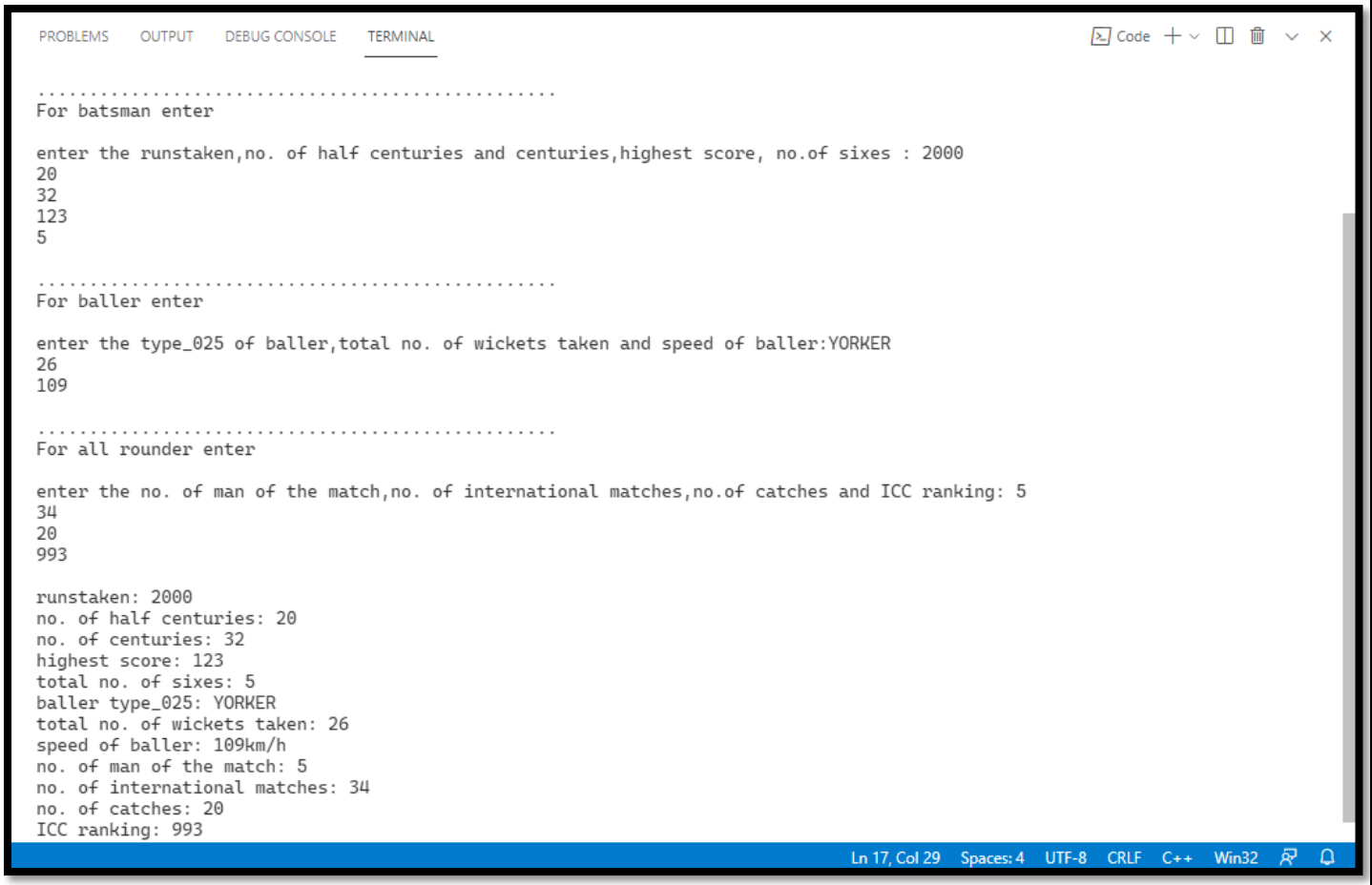

```cpp
/*Q7. Cricketer problem(Multiple  inheritance)*/
#include <iostream>
#include <string.h>
using namespace std;
class batsman
{
    int run_taken_025, half_cen_025, centur_025, high_score_025, no_
of_six_025;

public:
    void input_bt(int rt1, int hc1, int c1, int hs1, int ns1)
    {
        run_taken_025 = rt1;
        half_cen_025 = hc1;
        centur_025 = c1;
        high_score_025 = hs1;
        no_of_six_025 = ns1;
```

```
    }
    void display_bt()
    {

        cout << "\nrunstaken: " << run_taken_025;
        cout << "\nno. of half centuries: " << half_cen_025;
        cout << "\nno. of centuries: " << centur_025;
        cout << "\nhighest score: " << high_score_025;
        cout << "\ntotal no. of sixes: " << no_of_six_025;
    }
};
class baller
{
    char type_025[5];
    int wik_taken_025, speed_025;

public:
    void input_bl(char *type1, int wt1, int s1)
    {
        strcpy(type_025, type1);
        wik_taken_025 = wt1;
        speed_025 = s1;
    }
    void display_bl()
    {

        cout << "\nballer type_025: " << type_025;
        cout << "\ntotal no. of wickets taken: " << wik_taken_025;
        cout << "\nspeed of baller: " << speed_025 << "km/h";
    }
};
class allrounder : public batsman, public baller
{
    int man_of_match_025, inter_match_025, catches_025, icc_ran_025;

public:
    void input_all(int mm1, int im1, int cat1, int icc1)
    {
        man_of_match_025 = mm1;
        inter_match_025 = im1;
        catches_025 = cat1;
        icc_ran_025 = icc1;
    }
```

```
    void display_all()
    {
        cout << "\nno. of man of the match: " << man_of_match_025;
        cout << "\nno. of international matches: " << inter_match_02
5;
        cout << "\nno. of catches: " << catches_025;
        cout << "\nICC ranking: " << icc_ran_025;
    }
};
int main()
{
    int age, jn, odi, run_taken_025, half_cen_025, centur_025, high_
score_025, no_of_six_025, wik_taken_025, speed_025, n, man_of_match_
025, inter_match_025, catches_025, icc_ran_025;
    char name[50], type_025[10];

    cout << "\n.....\n"
;
    cout << "For batsman enter\n";
    cout << "\nenter the runstaken,no. of half centuries and centuri
es,highest score, no.of sixes : ";
    cin >> run_taken_025 >> half_cen_025 >> centur_025 >> high_score
_025 >> no_of_six_025;
    cout << "\n.....\n"
;
    cout << "For baller enter\n";
    cout << "\nenter the type_025 of baller,total no. of wickets tak
en and speed of baller:";
    cin >> type_025 >> wik_taken_025 >> speed_025;
    cout << "\n.....\n"
;
    cout << "For all rounder enter\n";
    cout << "\nenter the no. of man of the match,no. of internationa
l matches,no.of catches and ICC ranking: ";
    cin >> man_of_match_025 >> inter_match_025 >> catches_025 >> icc
_ran_025;

    allrounder a;

    a.input_bt(run_taken_025, half_cen_025, centur_025, high_score_0
25, no_of_six_025);
    a.input_bl(type_025, wik_taken_025, speed_025);
```

```
    a.input_all(man_of_match_025, inter_match_025, catches_025, icc_
ran_025);
    a.display_bt();
    a.display_bl();
    a.display_all();

    return 0;
}
```

OUTPUT-7



2005025_Hitu raj