Assignment_5_SurajKale

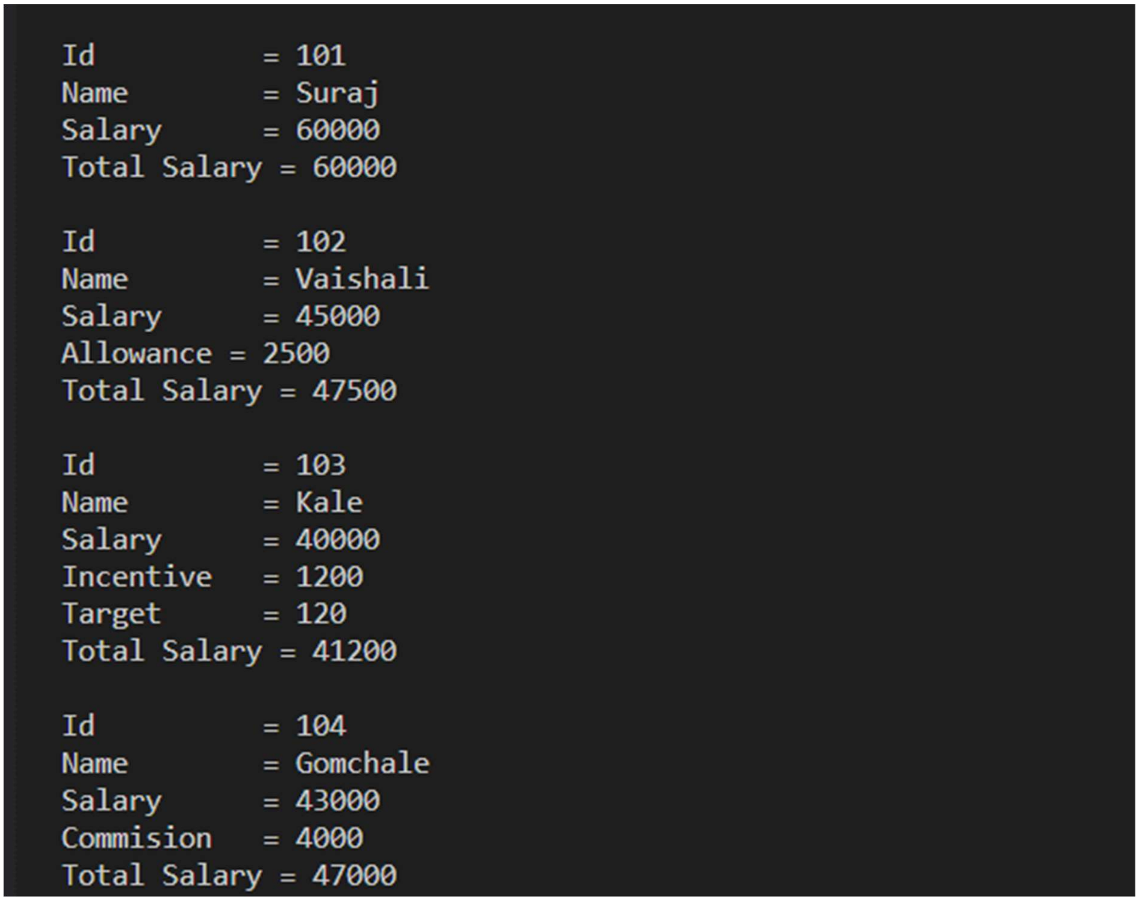
```
//Employee Hr Admin SalesManager Polymorphic behaviour


#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#include <cstdio>
#include <iostream>
#include <iomanip>
using namespace std;
struct Employee
{
    int id;
    char name[20];
    double salary;
    // default
    Employee()
    {
        this->id = 0;
        strcpy(this->name, "NotGiven");
        this->salary = 0;
    }
    // parameterised Constructor
    Employee(int id, const char *name, double salary)
    {
        this->id = id;
        strcpy(this->name, name);
        this->salary = salary;
    }

    // setters
    void setId(int id)
    {
        this->id = id;
    }
    void setName(const char *name)
    {
        strcpy(this->name, name);
    }
    void setSalary(double salary)
    {
        this->salary = salary;
    }

    // gettters
    int getId()
    {
        return this->id;
    }
    char *getName()
    {
        return this->name;
    }
    double getSalary()
    {
        return this->salary;
    }
    virtual double calculateSalary()
    {
        return this->salary;
    }
    virtual void display()
    {
        cout << "\nId       = " << this->id;
        cout << "\nName     = " << this->name;
        cout << "\nSalary   = " << this->salary;
    }
};
struct SalesManager : public Employee
{
    double Incentive;
    int target;

    // setter
    void setIncentive(double incentive)
    {
```

```
    this->Incentive = incentive;
}
void setTarget(int target)
{
    this->target = target;
}

// getters
double getIncentive()
{
    return this->Incentive;
}
int getTarget()
{
    return this->target;
}

// default
SalesManager() : Employee()
{
    this->Incentive = 0;
    this->target = 0;
}
// parameterised
```

```
    SalesManager(int id,const char *name, double salary, double incentive, int target) : Employee(id, name, salary)
    {
        this->Incentive = incentive;
        this->target = target;
    }
    double calculateSalary()
    {
        return this->Incentive + this->getSalary();
    }
    void display()
    {
        Employee::display();
        cout << "\nIncentive   = " << this->Incentive;
        cout << "\nTarget      = " << this->target;
    }
};
struct Admin : public Employee
{
    double allowance;

    void setAllowance(double allowance)
    {
        this->allowance = allowance;
    }
    double getAllowance()
    {
        return this->allowance;
    }

    Admin() : Employee()
    {
        this->allowance = 0;
    }
    Admin(int id,const char *name, double salary, double allowance) : Employee(id, name, salary)
    {
        this->allowance = allowance;
    }
    double calculateSalary()
    {
        return this->allowance + this->getSalary();
    }
    void display()
    {
        Employee::display();
        cout << "\nAllowance = " << this->allowance;
    }
};
struct HR : public Employee
```

```
{
    double commision;


    void setCommision(double commision)
    {
        this->commision = commision;
    }


    double getCommision()
    {
        return this->commision;
    }


    HR() : Employee()
    {
        this->commision = 0;
    }
    HR(int id,const char *name, double salary, double commision) : Employee(id, name, salary)
    {
        this->commision = commision;
    }
    double calculateSalary()
    {
        return this->commision + this->getSalary();
    }
    void display()
    {
        Employee::display();
        cout << "\nCommision   = " << this->commision;
    }
};

int main()
{
   Employee *emp;
   Employee emp1(101,"Suraj",60000);
   emp=&emp1;
   emp->display();
   cout<<"\nTotal Salary = "<<emp->calculateSalary();
   cout<<"\n";

   Admin ad1(102,"Vaishali",45000,2500);
   emp=&ad1;
   emp->display();
   cout<<"\nTotal Salary = "<<emp->calculateSalary();
   cout<<"\n";

   SalesManager sm1(103,"Kale",40000,1200,120);
   emp=&sm1;
```

```
  emp->display();

  cout<<"\nTotal Salary = "<<emp->calculateSalary();

  cout<<"\n";



  HR hr1(104,"Gomchale",43000,4000);

  emp=&hr1;

  emp->display();

  cout<<"\nTotal Salary = "<<emp->calculateSalary();

}
```



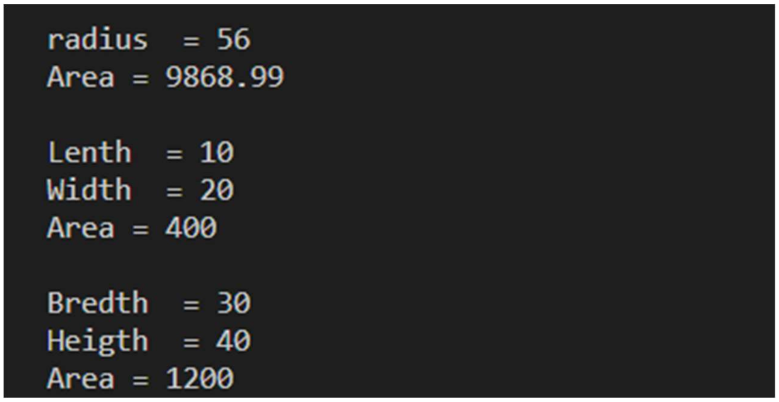
```
Id           = 101
Name         = Suraj
Salary       = 60000
Total Salary = 60000

Id           = 102
Name         = Vaishali
Salary       = 45000
Allowance = 2500
Total Salary = 47500

Id           = 103
Name         = Kale
Salary       = 40000
Incentive    = 1200
Target       = 120
Total Salary = 41200

Id           = 104
Name         = Gomchale
Salary       = 43000
Commision    = 4000
Total Salary = 47000
```

```
#include <iostream>
using namespace std;
float PI = 3.147;
struct Shape
{
    float area;
    Shape()
    {
        this->area=0;
    }
    Shape(float area)
    {
        this->area=area;
    }
    virtual float calculateArea()
    {
        return this->area;
    }
    virtual void display()
    {
        cout<<"\nArea = "<<area;
    }
};
struct circle : public Shape
{
```

```
float r;


void setRadius(float r)

{

    this->r = r;

}

float getRadius()

{

    return this->r;

}

circle()

{

    this->r = 0;

}

circle(float r)

{

    this->r = r;

}

void display()

{

    cout << "\nradius  = " << this->r;

}

float calculateArea()

{

    return this->area = PI * this->r * this->r;
    }
};
struct tringle : public Shape
{
    float b, h;

    void setBredth(float b)
    {
        this->b = b;
    }
    void setHeight(float h)
    {
        this->h = h;
    }
    float getBredth()
    {
        return this->b;
    }
    float getHeigth()
    {
        return this->h;
    }

    tringle()
    {
        this->b = 0;

        this->h = 0;

    }

    tringle(float b, float h)

    {

        this->b = b;

        this->h = h;

    }

    void display()

    {

        cout << "\nBredth  = " << this->b;

        cout << "\nHeigth  = " << this->h;

    }

    float calculateArea()

    {

        return this->b * this->h;

    }

};

struct rectangle : public Shape

{

    float l, w;

    rectangle()

    {

        this->l = 0;

        this->w = 0;
```

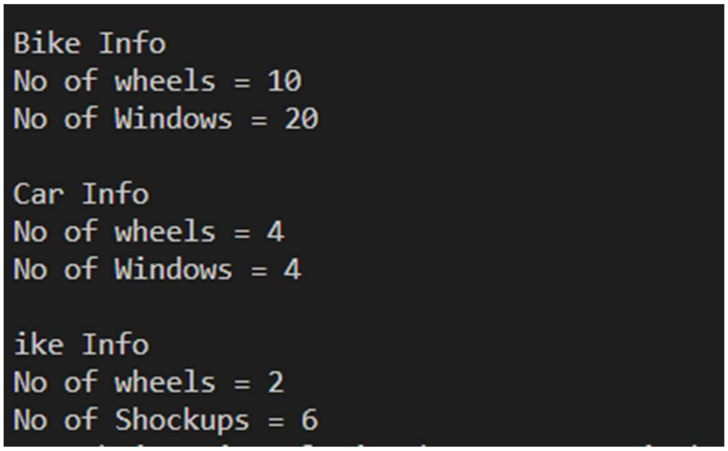
```
}

rectangle(float l, float w)

{

   this->l = l;

   this->w = w;

}

void setLength(float l)

{

   this->l = l;

}

void setWidth(float w)

{

   this->w = w;

}

float getLength()

{

   return this->l;

}

float getWidth()

{

   return this->w;

}


void display()

{
        cout << "\nLenth  = " << l;
        cout << "\nWidth  = " << w;
    }
    float calculateArea()
    {
        area = 2 * l * w;
        return area;
    }
};
int main()
{
    Shape *sh;
    circle c1(56);
    sh=&c1;
    sh->display();
    cout<<"\nArea = "<<sh->calculateArea();

    rectangle r1(10, 20);
    sh=&r1;
    cout<<"\n";
    sh->display();
    cout<<"\nArea = "<<sh->calculateArea();

    tringle t1(30, 40);
    sh=&t1;
    cout<<"\n";

    sh->display();

    cout<<"\nArea = "<<sh->calculateArea();

}
```

OUTPUT -



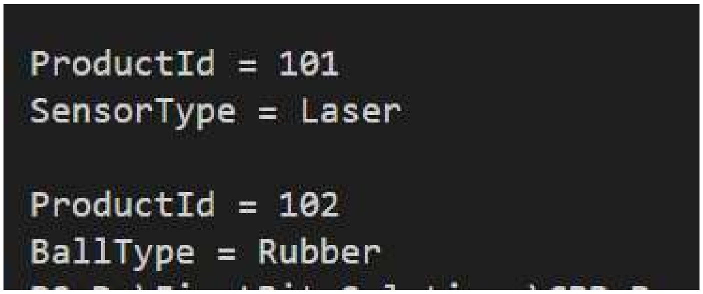
```
radius   = 56
Area = 9868.99

Lenth   = 10
Width   = 20
Area = 400

Bredth   = 30
Heigth   = 40
Area = 1200
```

```
// 3. Write a code to implement inheritance where vehicle is base class and derived
// classes like bike, car, bus etc.

#include <iostream>
using namespace std;

struct vehicle
{
    int noOfWheels;

    vehicle()
    {
        this->noOfWheels=0;
    }
    vehicle(int wheel)
    {
        this->noOfWheels=wheel;
    }
    void setWheels(int wheel)
    {
        this->noOfWheels = wheel;
    }
    int getWheels()
    {
        return this->noOfWheels;
    }
    virtual void display()
    {
        cout << "\nNo of wheels = " << this->noOfWheels;
    }
};
struct bus : public vehicle
{
    int noofWindow;
    bus():vehicle()
    {
        this->noofWindow=0;
    }
    bus(int wheel, int window):vehicle(wheel)
    {
        this->noofWindow=window;
    }
    void setWindows(int window)
    {
        this->noofWindow=window;
    }
    int getWindows()
    {
        return this->noofWindow;
    }
    void display()
    {
        vehicle::display();
        cout<<"\nNo of Windows = "<<this->noofWindow;
    }
};
struct car : public vehicle
{
    int noofWindow;
    car():vehicle()
    {
        this->noofWindow=0;
    }
    car(int wheel, int window):vehicle(wheel)
    {
        this->noofWindow=window;
    }
    void setWindows(int window)
    {
        this->noofWindow=window;
    }
    int getWindows()
    {
        return this->noofWindow;
    }
    void display()
    {
        vehicle::display();
        cout<<"\nNo of Windows = "<<this->noofWindow;
    }
};
struct bike : public vehicle
{
    int noofShockups;
    bike():vehicle()
    {
        this->noofShockups=0;
    }
    bike(int wheel,int shockup):vehicle(wheel)
    {
        this->noofShockups=shockup;
    }
    void setShockup(int shockup)
    {
        this->noofShockups=shockup;
    }
    int getShockup()
    {
        return this->noofShockups;
    }
    void display()
    {
        vehicle::display();
        cout<<"\nNo of Shockups = "<<this->noofShockups;
    }
};
int main()
{
    vehicle * v;
    bus b1(10,20);
    v=&b1;
    cout<<"\n\nBike Info";
    v->display();

    car c1(4,4);
    v=&c1;
    cout<<"\n\nCar Info";
    v->display();

    bike bk1(2,6);
    v=&bk1;
    cout<<"\n\nike Info";
    v->display();
}
```



```
Bike Info
No of wheels = 10
No of Windows = 20

Car Info
No of wheels = 4
No of Windows = 4

ike Info
No of wheels = 2
No of Shockups = 6
```

```
//mouse heirarchy


#include<iostream>
#include<string.h>
using namespace std;


class mouse
{
   protected:
   int productId;
   public:
   mouse()
   {
      this->productId=0;
   }
   mouse(int id)
   {
      this->productId=id;
   }
   void setProductId(int id)
   {
      this->productId=id;
   }
   int getProductId()
   {
      return this->productId;

   }

   virtual void display()

   {

      cout<<"\nProductId = "<<this->productId;

   }


};

class opticalMouse:public mouse

{

   protected:

   const char *sensorType;

   public:

   opticalMouse():mouse()

   {

      // strcpy(this->sensorType,"NotGiven");

      this->sensorType="NotGiven";

   }

   opticalMouse(int id,const char* sensorType):mouse(id)

   {

      // strcpy(this->sensorType,sensorType);

      this->sensorType=sensorType;

   }

   void setSensorType(const char* sensorType)

   {
      // strcpy(this->sensorType,sensorType);
      this->sensorType=sensorType;
   }
   const char* getSensorType()
   {
      return sensorType;
   }
   void display()
   {
      mouse::display();
      cout<<"\nSensorType = "<<this->sensorType;
   }
};
class ballMouse:public mouse
{
   protected:
   const char *ballType;

   public:
   ballMouse():mouse()
   {
      // strcpy(this->ballType,"NotGiven");
      this->ballType="NotGiven";
   }
   ballMouse(int id,const char* ballType):mouse(id)
   {
      // strcpy(this->ballType,ballType);
      this->ballType=ballType;
   }
   void setBallType(const char* ballType)
   {
      // strcpy(this->ballType,ballType);
      this->ballType=ballType;
   }
   const char* getBallType()
   {
      return this->ballType;
   }
   void display()
   {
      mouse::display();
      cout<<"\nBallType = "<<this->ballType;
   }

};
int main()
{
   const char *sensor="Laser";
   const char* ballType="Rubber";
   mouse *mouse;
   opticalMouse op1(101,sensor);

   // op1.setProductId(101);

   // op1.setSensorType(sensor);

   mouse=&op1;

   mouse->display();



   ballMouse b1(102,ballType);

   cout<<"\n";

   mouse=&b1;

   mouse->display();



   return 0;

}
```

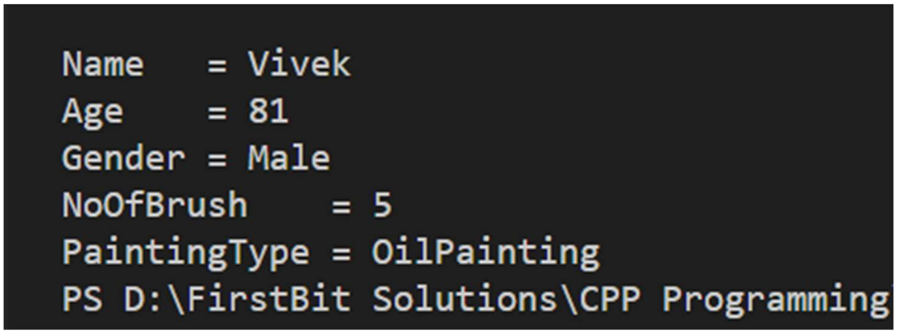


```
ProductId = 101
SensorType = Laser

ProductId = 102
BallType = Rubber
```

```
// artist painter musician

#include <iostream>
#include <string.h>
using namespace std;

class artist
{
protected:
    const char *name;
    int age;
    const char *gender;

public:
    // Default constructor suru
    artist()
    {
        // strcpy(this->name, "NotGiven");
        this->name="NotGiven";
        this->age = 0;
        // strcpy(this->gender, "NotDefine");
        this->gender="NotDefine";
    }
    // Parameterised constructor suru
    artist(const char *name, int age,const  char *gender)
```

```
{
   // strcpy(this->name, name);
   this->name=name;
   this->age = age;
   // strcpy(this->gender, gender);
   this->gender=gender;
}
// setters
void setName(const char *name)
{
   // strcpy(this->name, name);
   this->name=name;
}
void setAge(int age)
{
   this->age = age;
}
void setGender(const char *gender)
{
   // strcpy(this->gender, gender);
   this->gender=gender;
}
// getters
const char *getName()
{
        return this->name;
    }
    int getAge()
    {
        return this->age;
    }
    const char *getGender()
    {
        return this->gender;
    }

    // Display
    void display()
    {
        cout << "\nName   = " << this->name;
        cout << "\nAge    = " << this->age;
        cout << "\nGender = " << this->gender;
    }
};
class Painter : public artist
{
protected:
    int noOfBrush;
    char paintingType[20];
```

```
public:
    Painter() : artist()
    {
        this->noOfBrush = 0;
        strcpy(this->paintingType, "NotSpecified");
        // this->paintingType=
    }
    Painter(const char *name, int age,const  char *gender, int noOfBrush, const char *paintingType) : artist(name, age, gender)
    {
        this->noOfBrush = noOfBrush;
        strcpy(this->paintingType, paintingType);
        // this->paintingType=paintingType;
    }
    void setBrush(int noOfBrush)
    {
        this->noOfBrush = noOfBrush;
    }
    void setPaintingType(const char *paintingType)
    {
        strcpy(this->paintingType, paintingType);
        // this->paintingType=paintingType;
    }
    int getBrush()
    {
        return this->noOfBrush;
    }
    char *getPaintingType()
    {
        return this->paintingType;
    }

    void display()
    {
        artist::display();
        cout << "\nNoOfBrush    = " << this->noOfBrush;
        cout << "\nPaintingType = " << this->paintingType;
    }
};
int main()
{
    artist a1;
    const char name[10] = "Vivek";
    const char gender[10] = "Male";
    const char name1[10] = "Shubham";
    const char paintingType[20] = "OilPainting";
    Painter p1(name, 81, gender, 5, paintingType);

    p1.display();
}
```



```
Name   = Vivek
Age    = 81
Gender = Male
NoOfBrush    = 5
PaintingType = OilPainting
PS D:\FirstBit Solutions\CPP Programming
```