OOPS Lab File

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Compiler: GCC Compiler TDM-GCC 4.9.2 64-bit release with commands "-g -std=c++11" while calling the compiler

Google Drive Link with all assignment source files:
https://drive.google.com/drive/folders/1i2RUg7n1_B-QprabjQPSCsY2VaFhukvv?usp=sharing

1. Write a program to multilevel Inheritance Class A> Class B > Class C through Public Derivation. [Inheritance]

```
#include<bits/stdc++.h>
using namespace std;

class animals {
	public:
		string Animal = "Dog" ;
		void animal_name() {
			cout << "It's a " << Animal << '\n' ;
		}
};

class category : public animals {
	public:
		string Category = "Pet" ;
		void category_type(){
			cout << "It's used as a "<< Category << '\n' ;
		}
};

class breed : public category {
	public:
		string Breed = "German Shepherd";
		void breed_name(){
			cout<<"It's breed is " << Breed << '\n' ;
		}
};

int main()
{
	breed a ;
```

```
    cout << "Type of animal is: " << a.Animal << '\n' ;
    cout << "Category of animal: " << a.Category << '\n' ;
    cout << "Breed: "<< a.Breed << '\n' ;
    a.animal_name();
    a.category_type();
    a.breed_name();

}
```

Input	**Output**
-	Type of animal is: Dog Category of animal: Pet Breed: German Shepherd It's a Dog It's used as a Pet It's breed is German Shepherd

2. Write a program to multilevel Inheritance Class A> Class B > Class C through Private Derivation. [Inheritance]

```
#include<bits/stdc++.h>
using namespace std;

class animals {
	private:
		string Animal = "Dog" ;
	public:
		void animal_name() {
			cout << "It's a " << Animal << '\n' ;
		}

};

class category : private animals {
	private:
		string Category = "Pet" ;
	public:
		void category_type(){
			cout << "It's used as a "<< Category << '\n' ;
			animals::animal_name() ;
		}
};

class breed : private category {
	private:
		string Breed = "German Shepherd";
	public:
		void breed_name(){
			cout<<"It's breed is " << Breed << '\n' ;
			category::category_type() ;
		}
};

int main()
{
```

```
        breed a ;
        a.breed_name() ;
}
```

Input	Output
-	It's breed is German Shepherd It's used as a Pet It's a Dog

3. Write a program to demonstrate the multiple inheritance. [Inheritance]

```
#include <iostream>
using namespace std;

class Human {
	public:
		Me() {
			cout << "I'm a human" << '\n' ;
		}
};
class AwesomeGuy {
	public:
		AwesomeGuy() {
			cout << "I'm an awesome guy" << '\n' ;
		}
};

class Prabhav: public Me, public AwesomeGuy {
};

int main() {
	Prabhav prabhav;
	return 0;
}
```

Input	**Output**
-	I'm a human I'm an awesome guy

4. Write a program to demonstrate the virtual derivation of a class. [Inheritance]

```
#include <iostream>
using namespace std;

class A {
        public:
                int var = 10 ;
};
class B : public virtual A {
};
class C : public virtual A {
};
class Object : public B, public C {
};
int main() {
        Object o ;
        cout << o.var << '\n' ;
        return 0;
}
```

Input	**Output**
-	10

5. Create a base class shape used to compute area of figures. Derive three class triangle & rectangle & circle Function Getdata()& display area(). [Inheritance]

```
#include<iostream>
#include<bits/stdc++.h>
#include<stdio.h>
using namespace std;
class Shape {
	public:
	Shape() {
		cout << "Shape declared" << '\n' ;
	}
};
class Triangle : public Shape{
	public:
		int side ;
		void getInput() {
			cout << "Enter side length: " ;
			cin >> side ;
		}
		void display(){
			cout << "Area of the Triangle is " << sqrt(3.0/4.0) *
pow(side, 2) << '\n' ;
		}
};
class Circle : public Shape{
	public:
		int radius ;
		void getInput() {
			cout << "Enter radius: " ;
			cin >> radius ;
		}
		void display(){
			cout<<"Area of the Circle is: " << (3.14) * pow(radius, 2) <<
'\n' ;
		}
};
```

```
class Rectangle : public Shape{
	public:
		int length ;
		int breadth ;
		void getInput() {
			cout << "Enter length and breadth: " ;
			cin >> length ;
			cin >> breadth ;
		}
		void display(){
			cout << "Area of the rectangle is: " << length * breadth <<
'\n' ;
		}
};
int main(){
	Circle circle ;
	Rectangle rectangle ;
	Triangle triangle ;

	circle.getInput();
	rectangle.getInput();
	triangle.getInput();

	circle.display();
	rectangle.display();
	triangle.display();
}
```

Input and Output
Shape declared Shape declared Shape declared Enter radius: 1 Enter length and breadth: 2 3 Enter side length: 2 Area of the Circle is: 3.14 Area of the rectangle is: 6 Area of the Triangle is 3.4641