***LAHORE COLLEGE FOR WOMEN UNIVERSITY***

**Name: LINTA AFFAF**

**Department: BSSE**

**Roll no:23251652010**

**Submitted to: Miss AASMA AKRAM**

**Assignment: OOP lab 2**

***Lab 3***

***1)Friend function:***

**Headerfile:**

#ifndef MYROOM\_H

#define MYROOM\_H

class MyRoom {

private:

int privateData;

public:

MyRoom(int data);

friend void showPrivateData(const MyRoom& obj);

};

#endif

**Source file:**

#include "myroom.h"

#include <iostream>

using namespace std;

MyRoom::MyRoom(int data) : privateData(data) {}

void showPrivateData(const MyClass& obj) {

cout << "Private data: " << obj.privateData << endl;

}

**Mainfile:**

#include "myclass.h"

using namespace std;

int main() {

MyRoom obj(42);

showPrivateData(obj);

return 0;

}

***2)Friend classes:***

**Headerfile:**

#ifndef CLASSES\_H

#define CLASSES\_H

class ClassB;

class ClassA {

private:

int dataA;

public:

ClassA(int data);

void display();

friend class ClassB;

};

class ClassB {

private:

int dataB;

public:

ClassB(int data);

void display(ClassA obj);

};

#endif

**Sourcefile:**

#include "classes.h"

#include <iostream>

using namespace std;

ClassA::ClassA(int data) : dataA(data) {}

void ClassA::display() {

cout << "Data in ClassA: " << dataA << endl;

}

ClassB::ClassB(int data) : dataB(data) {}

void ClassB::display(ClassA obj) {

cout << "Data in ClassB: " << obj.dataA << endl;

cout << "Data in ClassB: " << dataB << endl;

}

**Main file:**

#include "classes.h"

int main() {

ClassA objA(12);

ClassB objB(56);

objA.display();

objB.display(objA);

return 0;

}

***3)Function overloading:***

**Headerfile:**

#ifndef FUNCTIONS\_H

#define FUNCTIONS\_H

class Calculator {

public:

int add(int a, int b);

float add(float a, float b);

};

#endif

**Source file:**

#include "functions.h"

int Calculator::add(int a, int b) {

return a + b;

}

float Calculator::add(float a, float b) {

return a + b;

}

**Main file:**

#include <iostream>

#include "functions.h"

using namespace std;

int main() {

Calculator calc;

int sum\_int = calc.add(3, 1);

float sum\_float = calc.add(5.4f, 2.3f);

cout << "Sum of integers: " << sum\_int << endl;

cout << "Sum of floats: " << sum\_float << endl;

return 0;

}

***4)Function overriding:***

**Header file:**

#ifndef SHAPES\_H

#define SHAPES\_H

#include <iostream>

class Shape {

public:

virtual void draw() const;

};

class Circle : public Shape {

public:

void draw() const override;

};

#endif

**Source file:**

#include "shapes.h"

using namespace std;

void Shape::draw() const {

cout << "Drawing a generic shape." << endl;

}

void Circle::draw() const {

cout << "Drawing a circle." << endl;

}

**Main file:**

#include "shapes.h"

int main() {

Shape\* shape = new Circle();

shape->draw();

delete shape;

return 0;

}

***5)Abstract class***

**Header file:**

#ifndef ANIMALS\_H

#define ANIMALS\_H

#include <iostream>

class Animal {

public:

virtual void makeSound() const = 0;

};

class Dog : public Animal {

public:

void makeSound() const override;

};

class Cat : public Animal {

public:

void makeSound() const override;

};

#endif

**Source file:**

#include "animals.h"

using namespace std;

void Dog::makeSound() const {

cout << "Dog says: Woof!" << endl;

}

void Cat::makeSound() const {

cout << "Cat says: Meow!" << endl;

}

**Main file:**

#include "animals.h"

int main() {

Dog dog;

Cat cat;

dog.makeSound();

cat.makeSound();

return 0;

}