Branch : MCA
Semester : Spring Semester 2022-23
Course Code : CA3205
Laboratory Name : Numerical Computing using C++
Assignement No. : ASSIGNMENT – 7
Assignment Title : Polymorphism

1) Implement the following class hierarchy using virtual function. Create base class pointers to hold address of base class as well as derived class objects and call the corresponding about() function of the assigned object.

Class : FamilyMember

Members : name, familyname, origin

Functions: constructor, destructor, about() //prints about father object

Class : Citizen

Members : name, country, year

Functions: constructor, destructor, about() //prints about mother object

Class : Employee (inherits FamilyMember and Citizen)

Members : name

Functions: constructor, destructor, about() //prints all about the child including parent info

2) Implement the abstract class and override the functions of the abstract class in the provided derived classes.

Class : ProbDistribution

Members: (none)

Functions: getExpectedVal()=0, getVariance()=0

Class: BinomailDistribution (inherits ProbDistribution)

Members: p, n, k

Functions: getExpectedVal(), getVariance()

Class: GeometricDistribution (inherits ProbDistribution)

Members: p, k

Functions: getExpectedVal(), getVariance()

3) Implement the abstract class and override the functions of the abstract class in the provided derived classes.

Class : Shape2D

Members: type

Functions: area()=0, perimeter()=0

Class: Circle (inherits Shape2D)

Members: center, radius

Functions: area(), perimeter(), print()

Class: Triangle (inherits Shape2D)

Members: base, height

Functions: area(), perimeter(), print()

4) Implement the diamond shaped inheritance hierarchy for Student, Sport, Exam, and Results classes as demonstrated in lecture notes. Resolve ambiguity using the virtual base class inheritance.