

Back-end Training

Chap 6: Inheritance and Polymorphism

Programming Questions

	Programming Questions	Related Concept
Q.1)	<p>Class SalaryDetails: Salary, BasicPay, HRA, TA Constructor() - accepts only BasicPay Compute() - Computes Salary as BasicPay + HRA + TA (HRA is 30% of Basic and TA is 1600 Rs)</p> <p>Class Employee: EmployeeId, Name, Experience, Company, Age, Mobile Number, Object of SalaryDetails Constructor() CalculateSalary() Display()</p> <p>Manager inherits from Employee: Department, SpecialBonus CalculateSalary() - Needs to add special bonus in the earlier calculated salary Display()</p> <p>Associate inherits from Employee: Supervisor (which is EmployeeId of existing Employee) Grade - Will be any value out of 1, 2, 3 ContractEndDate PerformanceGrade - will be any value out of A, B, C RenewContract() - the contract can be renewed only if there are less than or equal to 10 days remaining for the completion of contract. The contract renewal will be as per the performance grade as follows: A - Renew by 300 days B - Renew by 150 days C - Renew by 75 days</p> <p>CalculateSalary() - Basic is 10000 Rs. the total salary is calculated as per the grade of the employee as follows: Grade 1 - Basic + 20 % Basic + TA (Rs 1600) Grade 2 - Basic + 15 % Basic + TA (Rs 1000) Grade 3 - Basic + 10 % Basic + TA (Rs 500)</p> <p>Display()</p> <p>Implement the above hierarchy and write main function for testing the same.</p>	Inheritance

Q.2)	<p>A class Shape represents a shape with two dimensions. It contains following functions: Constructor() - takes two values as arguments and assigns then to the dimensions FindArea() - returns the product of two dimensions as area A class Circle, Rectangle and Triangle (3 sides) are derived from Shape. Create necessary constructors. The function FindArea() can be used as it is or can be overridden.</p> <p>Create a class Compuation which contains a static function Compare() which accepts two Shape references and returns 1 if first shape has greater area, 2 if second shape has greater area and 0 if both areas are equal. Another function FindGreatest() takes three shape references and displays the appropriate message specifying which shape (Circle, Rectangle or Triangle) has a greatest area.</p> <p>Write suitable main to create objets of each type of shape and find the shape with the greatest area.</p>	Polymorphism
Q.3)	<p>Create a class Array which stores an array of integers and functions to read elements and display elements. Derive a class NewArray from Array which adds 'count' variable to store the number of elements currently stored in the array. Also create function 'Insert()' which adds the new element at the end of the array and increments count by one. Derive another class BetterArray from NewArray and redefine function 'Insert()' to expand the array with double the size, copy the old elements and then call super class insert for normal insertion.</p>	Polymorphism
Q.4)	<p>Create an Employee which stores the following information: Id, Name, Mobile Number, Date of Birth, Job Profile, Department, Business Unit, Date of Joining, RM_Id. Create a suitable constructors and override ToString().</p> <p>A class EmployeeRepo maintains a collection of Employees and provide the following functions. (1) AddNewEmployee() (2) RemoveEmployeeById() (3) UpdateMobileNumberOfEmployeeById() (4) GetAllEmployeesByDepartment() (5) GetAllEmployeesByJoiningDateRange() (6) RemoveAllEmployeesByDepartment() (7) GetAllEmployeesByRM() (8) GetRMDetailsByEmployeeId()</p> <p>Make use of files, so that at the end of every execution, the complete data will be stored in a file and at the beginning of every execution the whole data will be read from the file into the system.</p>	Class, Collections and Files