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Object Oriented Programming (SY BSc.IT)

Assignment I

1. Take a real-world problem, such as the task of sending flowers and describe its solution in terms of agents (objects) and responsibilities.
2. For a common game such as solitaire or twenty-one describe a software system that will interact with the user as an opposing player. Example components include the deck and the discard pile.
3. Describe the software system to control an ATM (Automated Teller machine). Give interaction diagrams for various scenarios that describe the most common uses of the machine.

Assignment II

1. Write a class description for complex numbers. Write methods for addition, subtraction, and multiplication of complex numbers.
2. Contrast the encapsulation provided by the class mechanism with the encapsulation provided by the module facility. How are they different? How are they same?
3. Write a short note arguing for or against automatic memory-management (garbage collection) systems.

Assignment III

1. Suppose we generalize the eighty-queen problem to N-queens problem, where the task is to place N-queens on an N by N chess board. How much the programs are change?
2. Consider the three geometric concepts at a line (infinite in both directions), a ray (fixed at a point in one direction) and a segment (a portion of a line with fixed end points). How might you structure classes representating three concepts in an inheritance hierarchy?
3. Describe various forms of Inheritance.

Assignment IV

1. What is reverse Polymorphism? Describe reverse Polymorphism problem.
2. Describe Static and Dynamic binding.
3. Discuss whether the error-checking facilities made possible by static typing are worth the loss in flexibility how important is the container class problem?

Assignment V

1. Describe Replacement. Describe principle of Substitutability.
2. What is refinement? Describe with suitable example
3. Although the systematic use of refinement semantics makes it more difficult to create subclasses that are not subtypes it is still possible. Illustrate this by giving an example subclass that uses retirement but is nevertheless not a subtype of a base class.

Assignment VI

1. Describe following terms: Equality, covariance, and Contra variance.
2. What is type conversion? Give suitable example.
3. What is name ambiguity in care of multiple inheritances? How it can be resolved?

Assignment VII

1. Discuss virtual inheritance in C++ from the point of view of Parma's principle on information hiding.
2. What is overloading? Give suitable example.
3. What is overriding? Give suitable example.

Assignment VIII

1. Describe virtual polymorphism with suitable example.
2. What is container class? Give Suitable example.
3. Write short note on Parameterized classes.

Assignment IX

1. Describe various types of coupling
2. Describe various types of cohesion
3. Write short note on control of access & visibility

Assignment X

1. Write short note of patters and frameworks
2. Write short note on compilers
3. Write short note on constructors & destructors.