JAVA LAB Exercises   Date : 03.02.2025
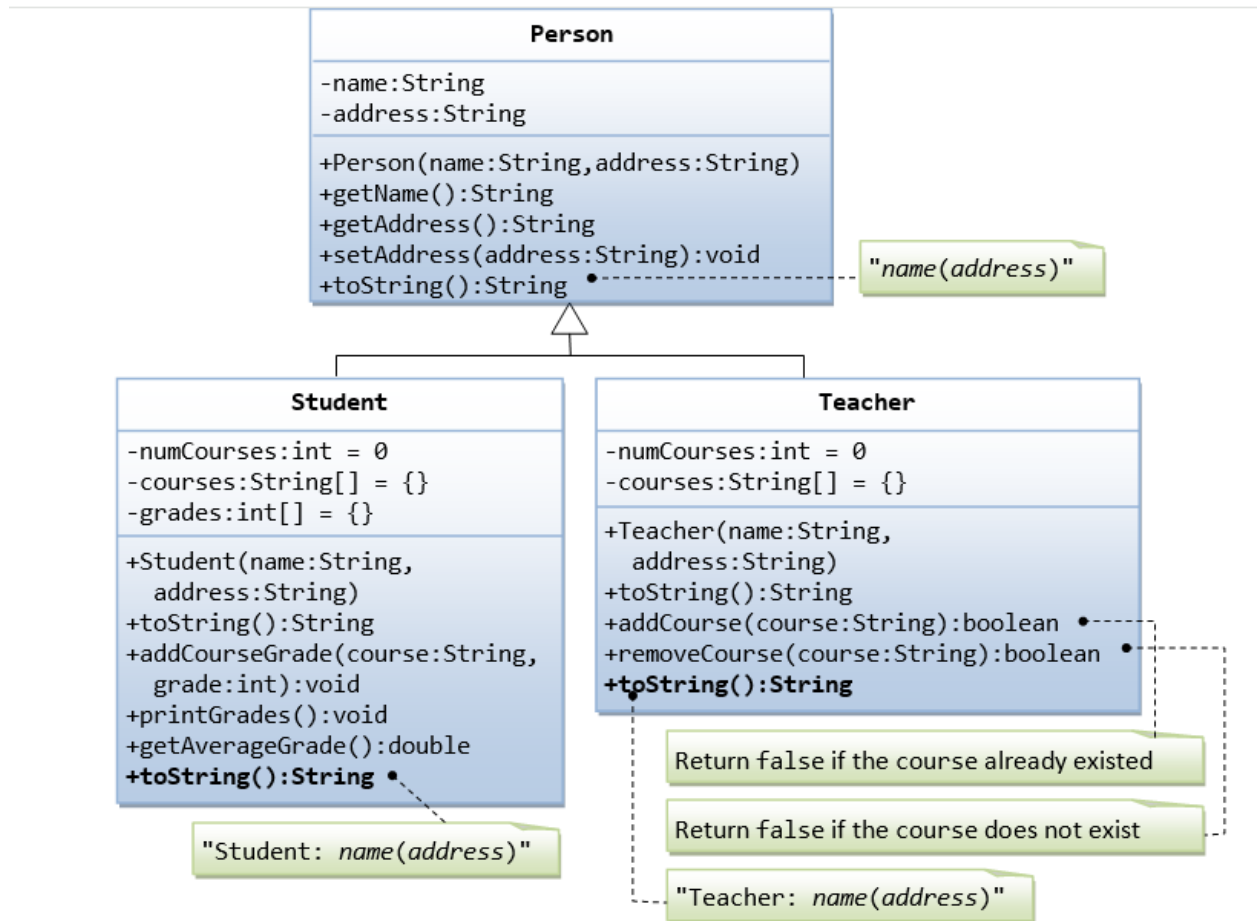
1. Write a Java application to demonstrate the following class hierarchy.

Person

-name:String
-address:String

+Person(name:String,address:String)
+getName():String
+getAddress():String
+setAddress(address:String):void
+toString():String

"*name(address)*"

Student

-numCourses:int = 0
-courses:String[] = {}
-grades:int[] = {}

+Student(name:String,
   address:String)
+toString():String
+addCourseGrade(course:String,
   grade:int):void
+printGrades():void
+getAverageGrade():double
+toString():String

"Student: *name(address)*"

Teacher

-numCourses:int = 0
-courses:String[] = {}

+Teacher(name:String,
   address:String)
+toString():String
+addCourse(course:String):boolean
+removeCourse(course:String):boolean
+toString():String

Return false if the course already existed

Return false if the course does not exist

"Teacher: *name(address)*"

2. Write a Java program to create an interface Sortable with a method sort (int[] array) that sorts an array of integers in descending order. Create two classes QuickSort and MergeSort that implement the Sortable interface and provide their own implementations of the sort() method.

3. Write a Java programming to create a banking system with three classes - Bank, Account, SavingsAccount, and CurrentAccount. The bank should have a list of accounts and methods for adding them. Accounts should be an interface with methods to deposit, withdraw, calculate interest, and view balances. SavingsAccount and CurrentAccount should implement the Account interface and have their own unique methods.