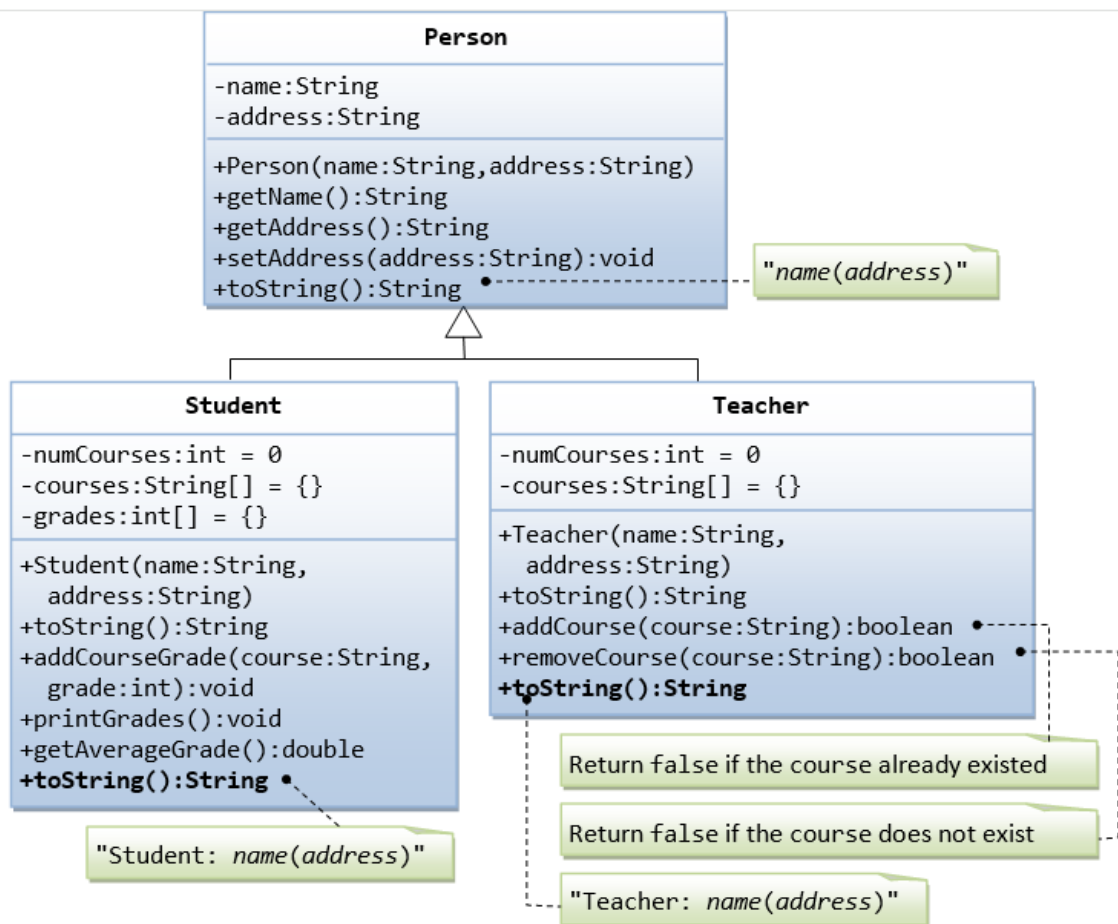


Java Programming Lab – Week 4

1. Write a Java application to demonstrate the following class hierarchy.



2. Books can come in various formats, like paper books, audio books, ebooks, etc. Create a generic class **Book** that has as common attributes the title, the year of publication, and the author. The constructor of this class should instantiate all three attributes. Override the `toString` method of class **Book** that returns a string that contains the values of its attributes. Create a subclass **PrintBook** that extends **Book** with attributes **Publisher** and **ISBN**. Create another subclass **AudioBook** which has the book's size (in MB), its play length and the playback artist's name as attributes. Both **PrintBook** and **AudioBook** classes override the `toString` method inherited from **Book**. Write a Java application to demonstrate the usage of this hierarchy.

3. Write a program that randomly fills in 0s and 1s into an n-by-n matrix, prints the matrix, and finds the rows and columns with the most 1s. (Hint: Use two ArrayLists to store the row and column indices with the most 1s.) Here is a sample run of the program:

```
Enter the array size n: 4 
The random array is
0011
0011
1101
1010
The largest row index: 2
The largest column index: 2, 3
```