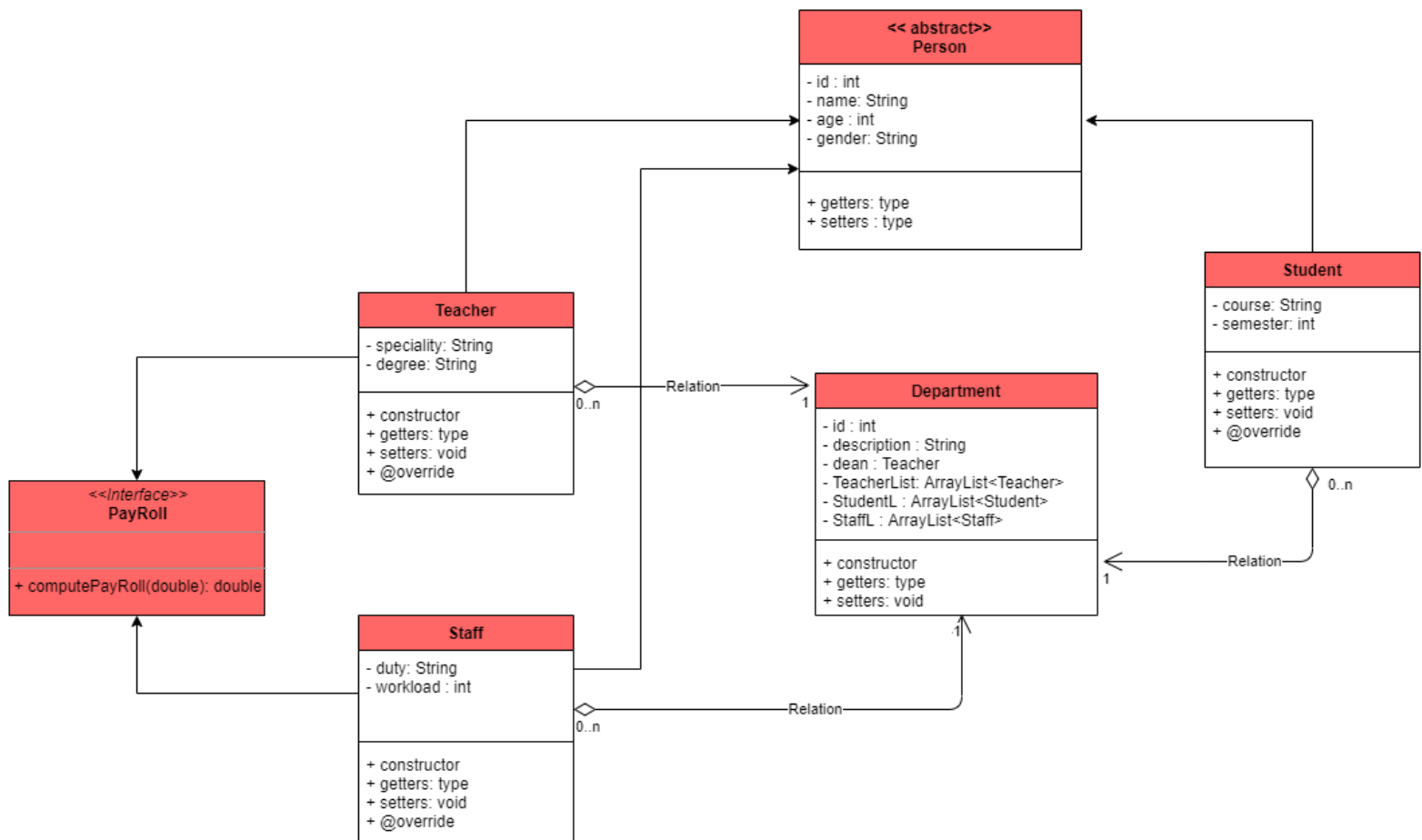


Topics: interface, abstract class, inheritance, polymorphism, i/o file, exception handling, and JUnit tests.

Consider the following UML diagram, implement the respective classes in Java following the description/instructions given below.



- A department contains lists of students, teachers, and staffs; each of which (a student, teacher, or staff) belonging exclusively to one department.
- Implement an abstract class Person (name, gender, age, nationality, etc..) that contains an abstract method to define a person's category (teacher, student, or staff).
- The interface PayRoll contains ComputePayRoll () method to be implemented as follows:
 - (i) For each teacher, the salary is computed as $(36 * \text{saldegree} * 2) * 0.76$, where saldegree is 112, 82, 42 for PhD, Master, and Bachelor, respectively.
 - (ii) For each staff, the salary is computed as $(\text{workload} * 32 * 2) * 0.85$, where workload is the weekly working hours. The working hours cannot exceed 36.
- Extend class Person with concrete classes, namely, Teacher, Staff, and Student, and override the toString() method of Person inside each class.
- Implement the method ComputePayRoll() inside Teacher and Staff classes.

Observations:

- A department has a dean, who should be a teacher of that department, otherwise an exception must be thrown.
- Teachers, students, and staffs are added/assigned to a department, first by loading/reading from a text file during the first execution of the application. Moreover, new teachers, students, and staff may be added/assigned using the graphical user interface.
- Trying to add a teacher, a student, or a staff member to an inexistent department (based on department id) should rise/throw an exception.
- Trying to add a teacher, a student, or a staff member that already exists/ added (based on the id) to department should throw an exception.
- Each new teacher, student, and staff added to a department should be stored to the text file before exiting the application, generating a new version of the text file. So, if the text file does exist (which is the case), new teachers, students, or staffs should be appended. There are files of teachers, students, and staffs.
- The customized exceptions handling for the cases above must be implemented.
- Test sets should be generated for testing the effectiveness of each method.
- Samples of teachers, staffs, and students are provided along with the present document.

Teams: at most two students.

Deliverable: Zip file containing the project codes, screenshots, and a demo (short recording) or a link to the video.

Deadline: Wednesday, December 15, 2021.