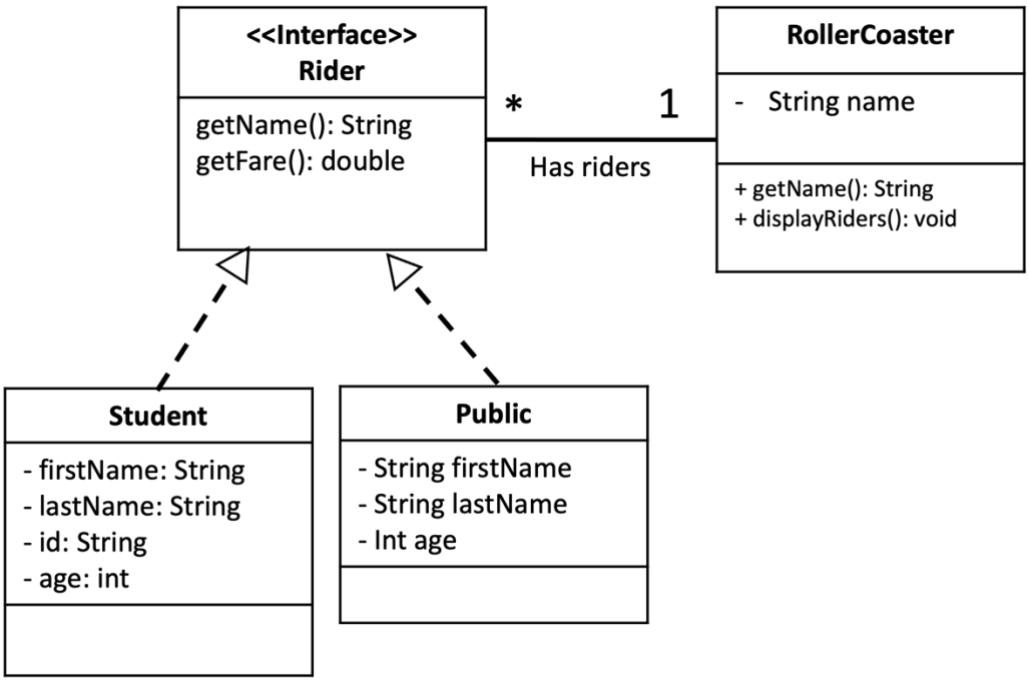
ACS-1904 W2024

Lab #7: The Amusement Park Interface Project

Due by Friday, March *1* at 11:59 pm

- Compress all of the .java files in this project into a .zip file called Lab7.zip.
- Submit the .zip file containing the Java classes for this project to the Nexus dropbox
- **Include your name and student number in each file as a comment.**

Develop the classes and interface represented in the following partial UML diagram:



Note that the `Student` and `Public` classes include both a first and last name, but the `Rider` interface requires a full name. The `fare` is the cost to ride the RollerCoaster and is determined by a passenger's age and is calculated differently for Student and Public objects:

Public: Adult fare is $8.99, Youth is $5.99 for children under the age of 18, and Senior is $6.50 for people over the age of 65.
Student: Under 25 years old pay $6.50, 25 and over, pay $7.50.

Add necessary features suggested for the `RollerCoaster` class such as the name of the coaster and a method to display the names of the riders and their fares. Include a field and method for the required association. Add a method called `displayRiders()` that lists the names of those riders along with their fare.

Include methods/fields/constructors as required.

Develop a `RollerCoasterDriver` class to test your code. You must add (hardcode) several `Riders` (both Public and Student) to the `RollerCoaster's` riders list. Display the Roller Coaster name and rider list using the `displayRiders()` method. (that is display the list of riders using the `displayRiders()` method, `displayRiders()` does not include the name of the Roller Coaster).

Sample output: if you want to include the formatting to print the fares to two decimal places you can but it is not required.

```
Coaster Name: Big Thunder
---------------------------------

Big Thunder Riders:
$5.99   Philip Fry
$6.5    Hermes Conrad
$6.5    Kif Kroker
$8.99   Zapp Branningan
$6.5    Bender Rodriguez
$6.5    Amorphous Blob
$7.5    Hubert Farnsworth
$7.5    Yancy Fry
$7.5    Turanga Leela
$8.99   Dwight Conrad
$5.99   Cubert Farnsworth

end of program
```

Submit your `Lab7.zip` file that includes all lab files `(Rider.java, Public.java, Student.java, RollerCoaster.java, RollerCoasterDriver.java)` via Nexus.

EXTRA WORK: Do not submit

* Note that the `Rider` interface and `RollerCoaster` class are not required for this part.

1. Have your `Public` class implement the `Comparable` interface. Work with the `compareTo()` method to return different results based on name:
   - Alphabetical order by first name
   - Reverse-alphabetical order by first name
   - Alphabetical by last name first, followed by first name.
     - E.g. Philp Fry would be ordered before Yancy Fry

   Test these in a new driver class by adding the list of `Public` instances to an array and using `Arrays.sort`.

2. Develop a `Comparator` for `Public` named `OrderByAge` that provides an ordering of `Public` objects based on their age (oldest to youngest).
   Test this in your driver class by adding the list of `Public` instances to an array and using `Arrays.sort` and an instance of this `Comparator`.