RACE TYRES

Statement of Work:

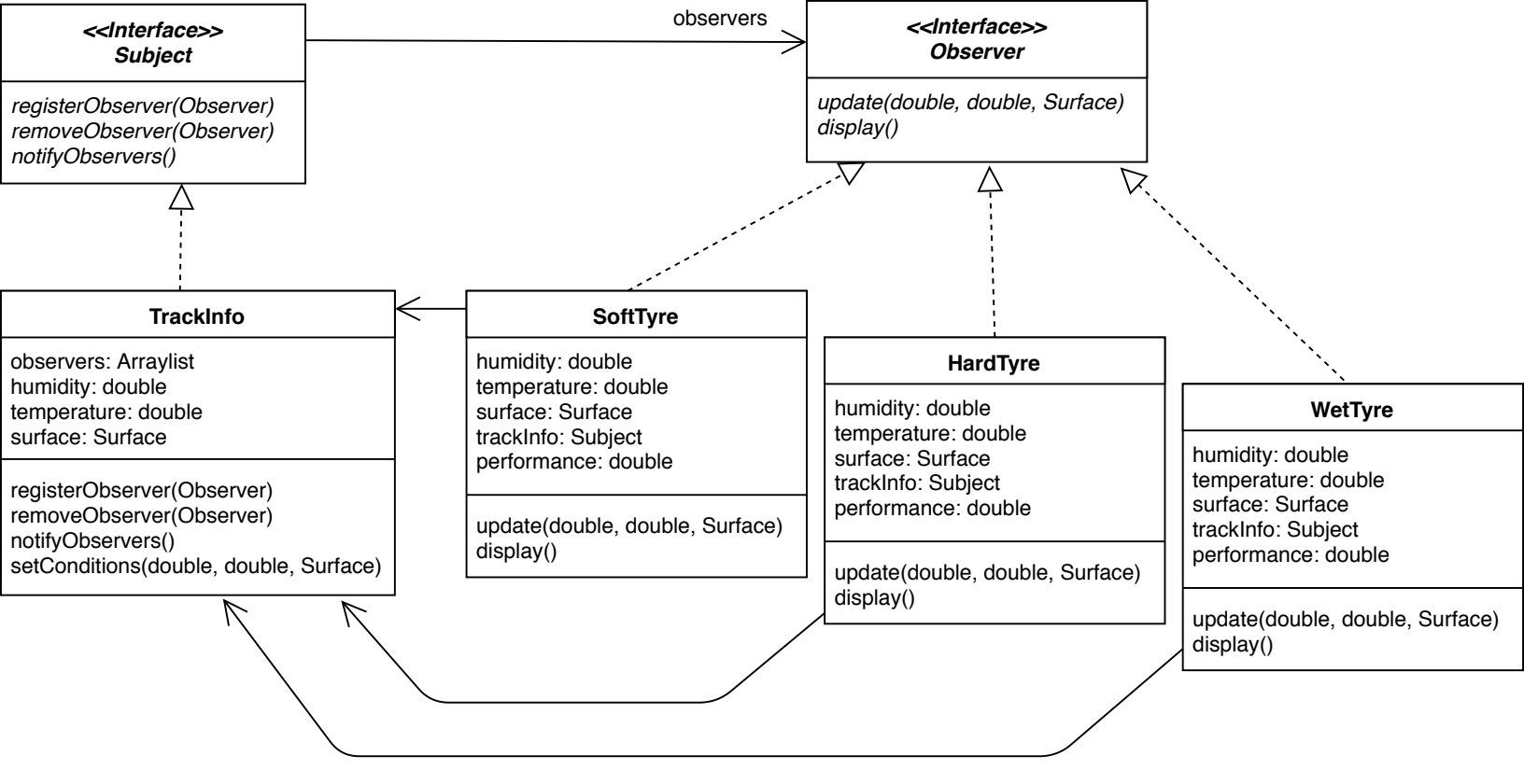
In this project, there are different race tyres to test in different conditions. The program should display each tyre's performance in the specified conditions. The same condition is applied to all tyres and each of them will give a different performance value. There is a displayer for each tyre. Tyres performance is based on track conditions like humidity, temperature and the surface of the track. For example, if humidity is high, wet tyre should have better performance. Or the surface is asphalt and temperature is high, soft tyre should have better performance. The higher performance value means the tyre is better in those conditions.

Design patterns:

Observer pattern is useful to solve this problem.

We can think tyre displayers as subscribers, and the track info class which will set the conditions can be the publisher. Track info can register tyre displayers as observers, and notify them when conditions are changed. Since same conditions are applied for all tyres, we can notify them through the observer interface. Then tyre displayers that implemented the observer interface, can do their own calculations according to the conditions.

UML:


<<Interface>>
Subject
registerObserver(Observer)
removeObserver(Observer)
notifyObservers()
observers
<<Interface>>
Observer
update(double, double, Surface)
display()
TrackInfo
observers: Arraylist
humidity: double
temperature: double
surface: Surface
registerObserver(Observer)
removeObserver(Observer)
notifyObservers()
setConditions(double, double, Surface)
SoftTyre
humidity: double
temperature: double
surface: Surface
trackInfo: Subject
performance: double
update(double, double, Surface)
display()
HardTyre
humidity: double
temperature: double
surface: Surface
trackInfo: Subject
performance: double
update(double, double, Surface)
display()
WetTyre
humidity: double
temperature: double
surface: Surface
trackInfo: Subject
performance: double
update(double, double, Surface)
display()