Object Oriented Analysis and Design

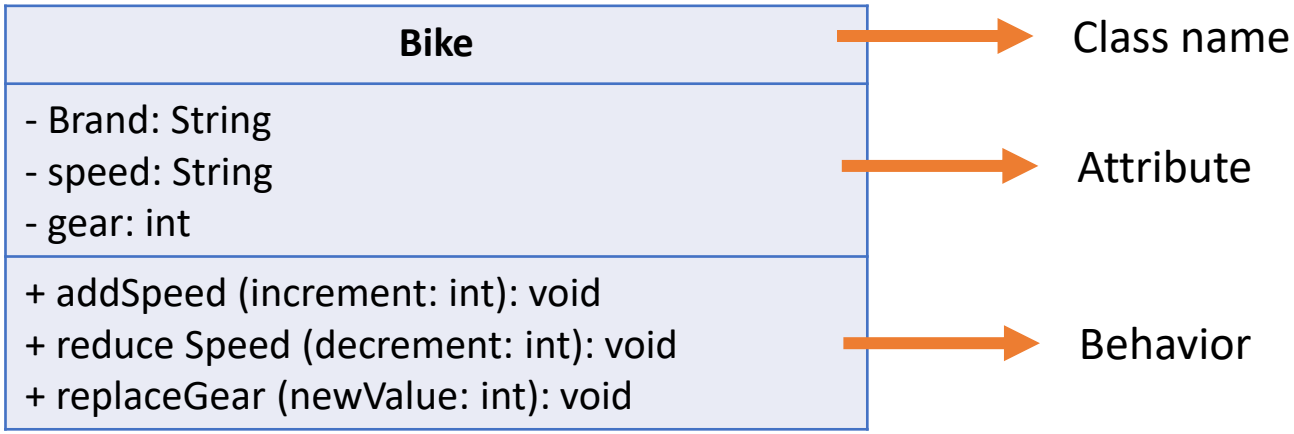
Class Diagram

Ridwan Rismanto

UML Class Diagram

In object-oriented programming, the class design is described by the UML Class Diagram.

For example the bicycle class, which has the brand state , speed, gear and behavior , increases speed, reduces speed, and changes gear, which is illustrated by the class diagram as follows:



Object Relations - Association

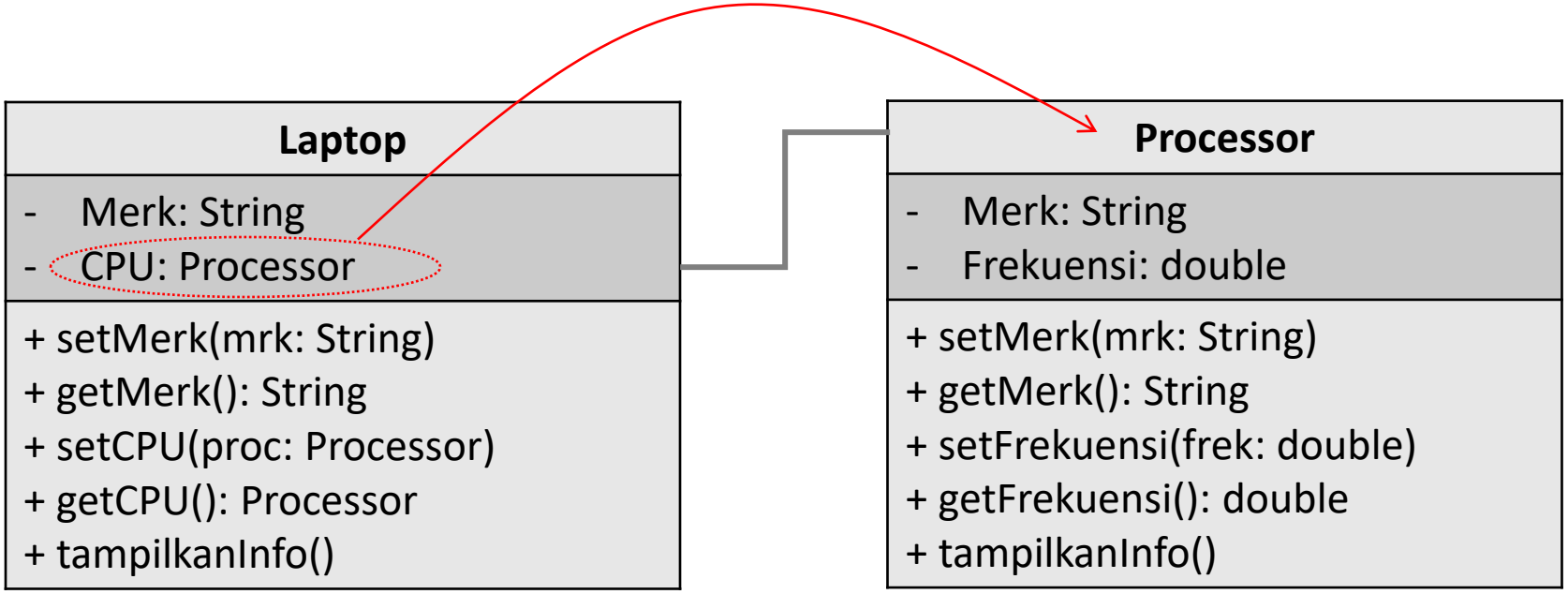
Also called the **Association**

Attributes of a class can also be objects

For example, the Flying Airplane class, in which there are engine, wing, fin and pilot objects.

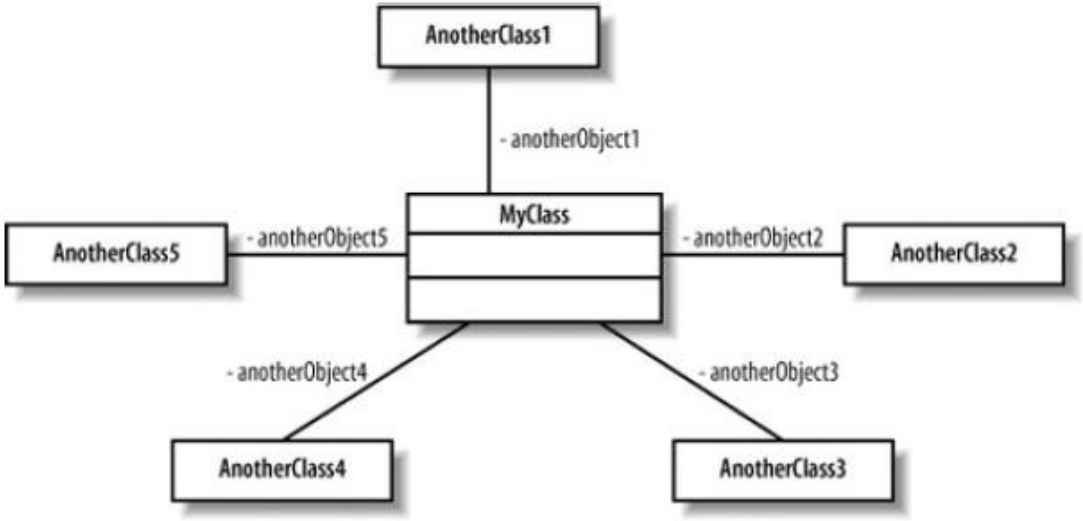
Another example: a laptop in which there is a processor

Object Relations - Association

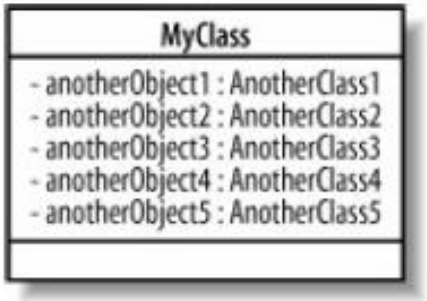


Object relations are represented with straight lines

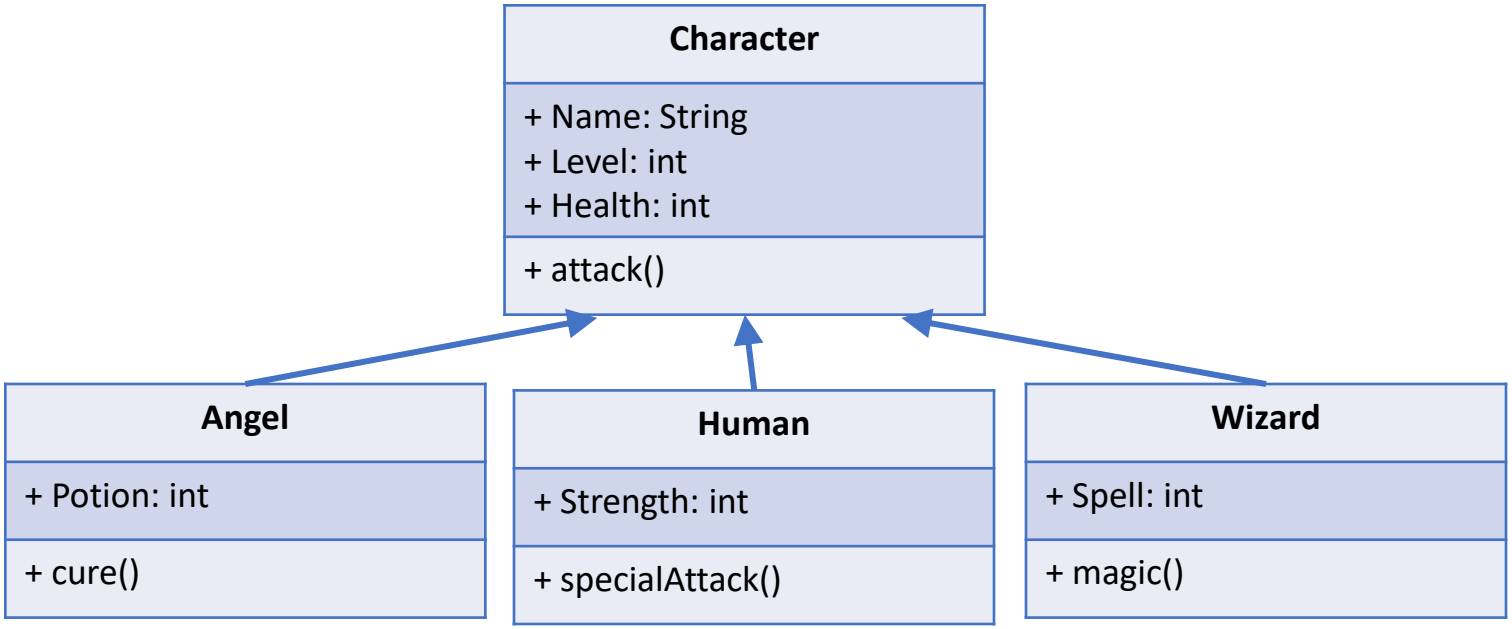
Example of Association



Inline Association:

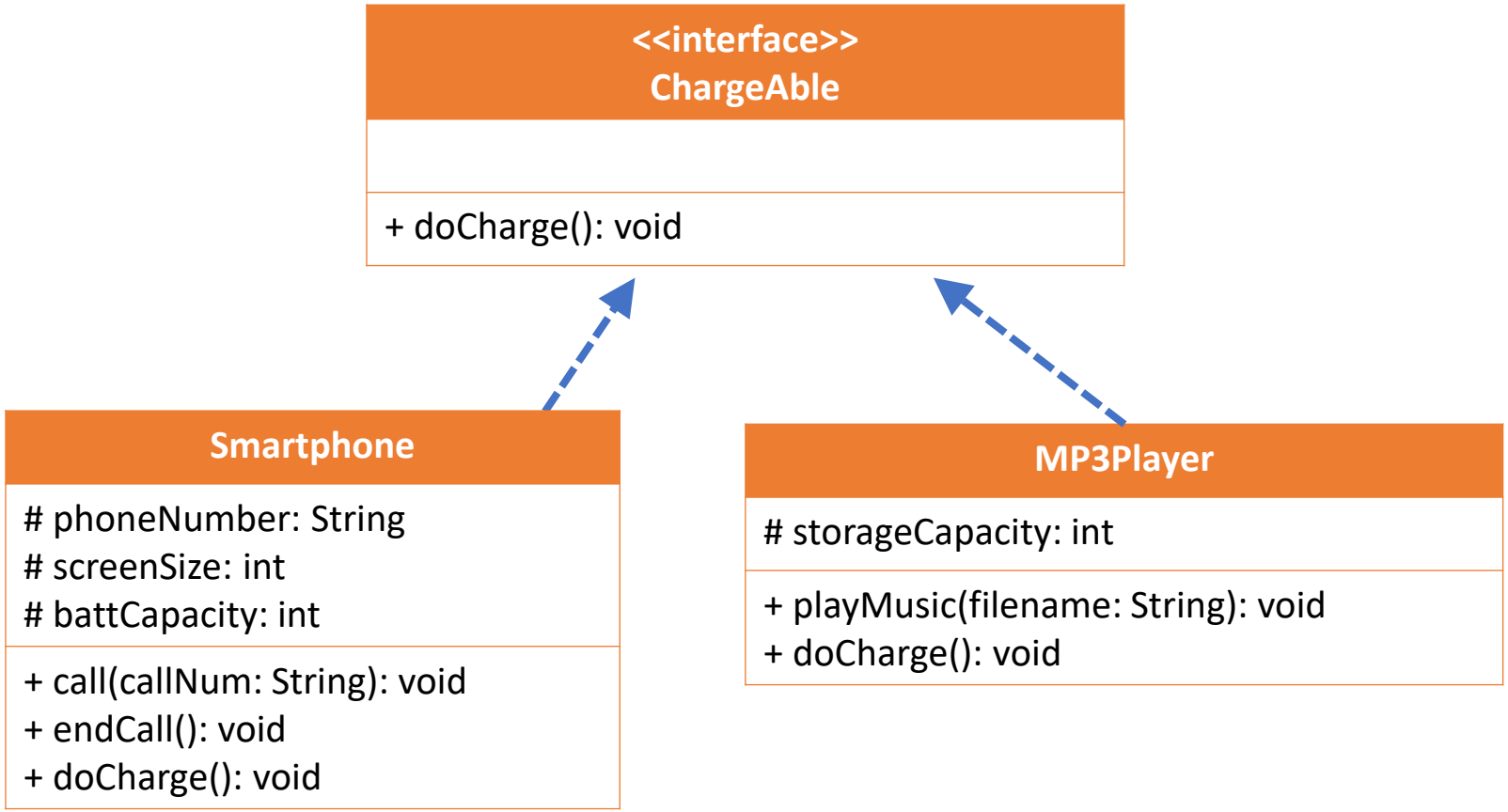


Inheritance



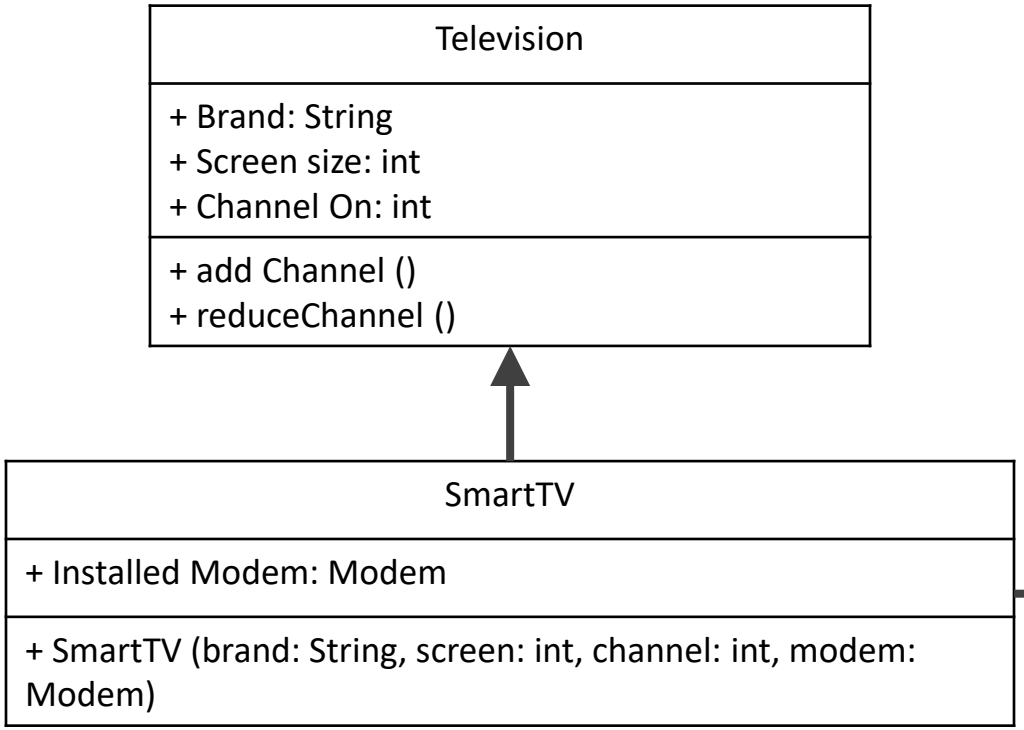
Inheritance is represented by an arrow pointing to the parent

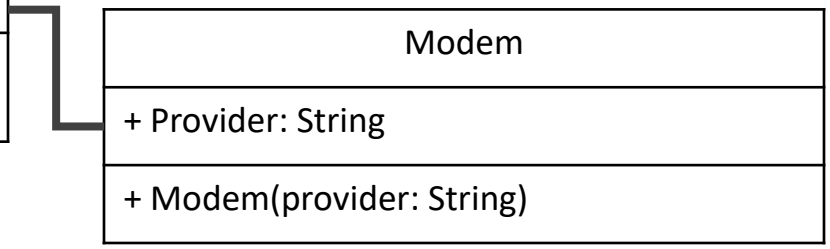
Interface



Interfaces are represented by dotted arrows pointing from the class implementing to the interface.

Example 1

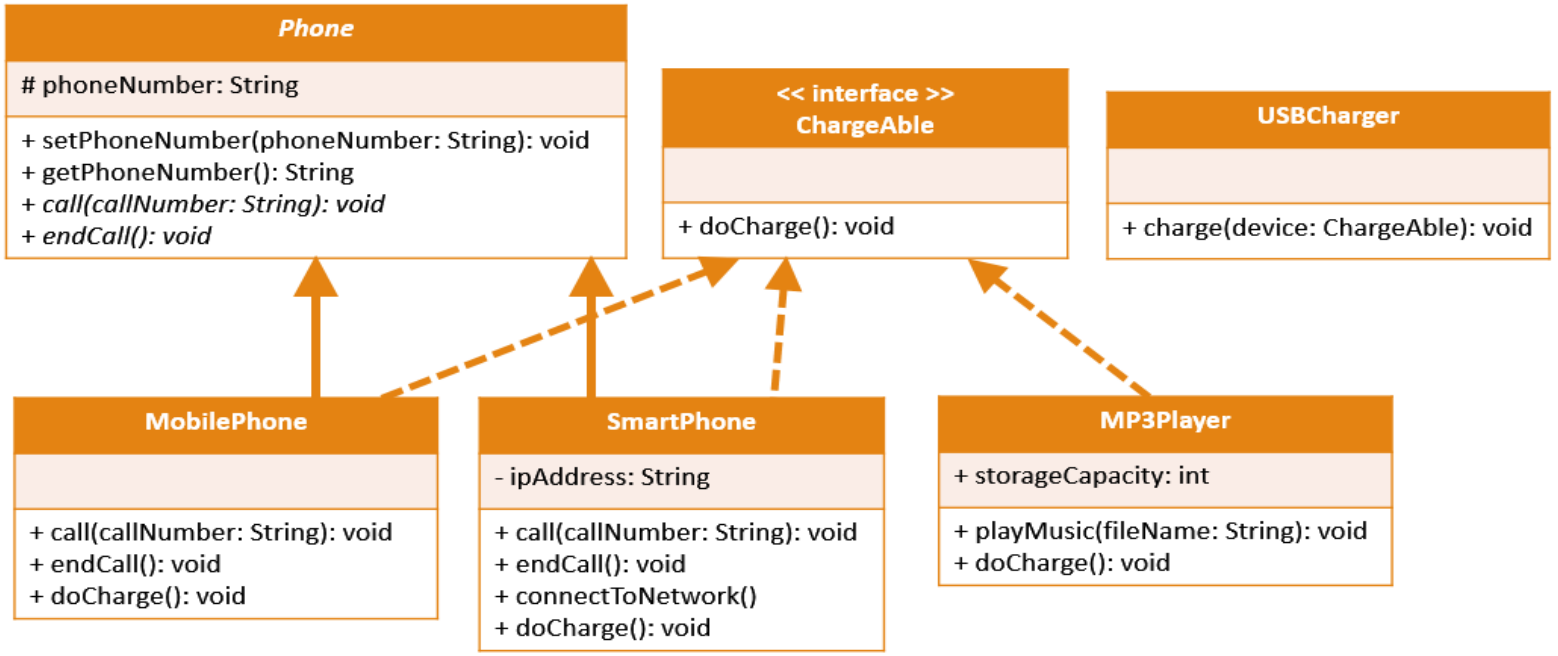




A television has attributes such as brand, layer size, active channel and can add and remove channels. Smart TV is another type of television but has the attributes of a modem. The modem itself has a provider attribute.

Example 2

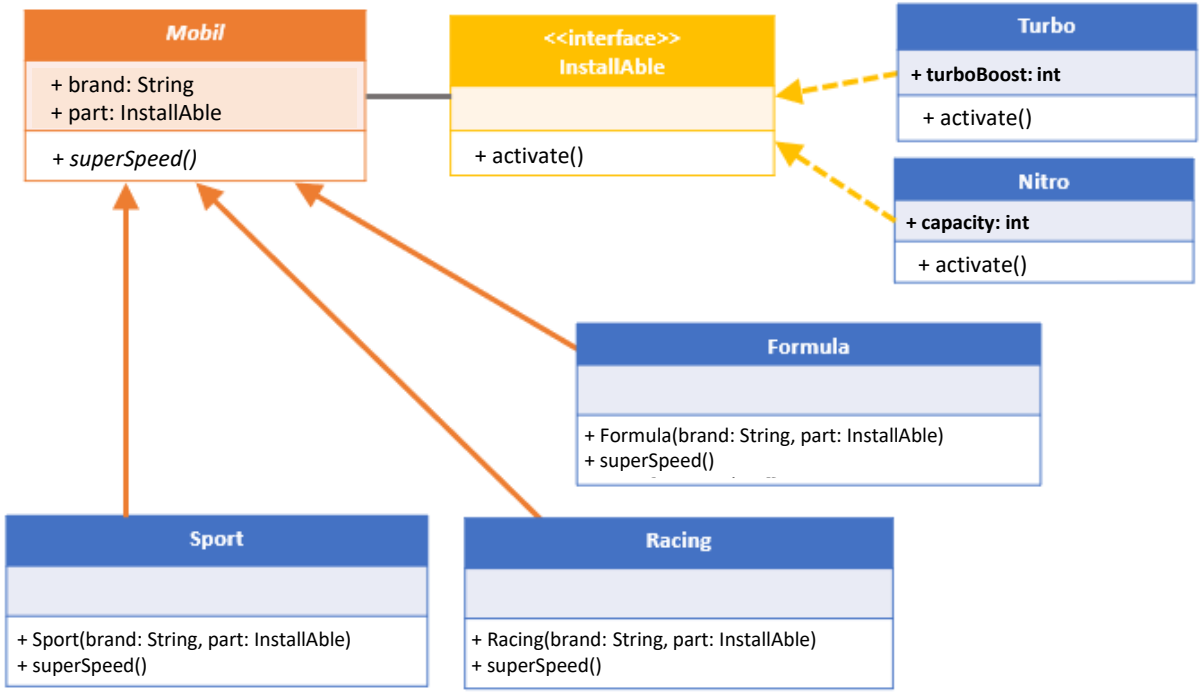
Mobile phones and smartphones are one type of phone, all of which have the phone number attribute, and can make and end calls. The difference is on mobile phones and smartphones, you can charge the battery. And on a smartphone there is an ip address attribute. All types of phones can be charged using a USB charger. There is also another object, namely an MP3 player that has a storage capacity attribute, and can also be charged using a USB charger.



Contoh 3

In a racing game, there are several types of cars, namely sports, racing and formulas. All three share the brand and part attributes, and a method for running a super speed. There are several kinds of parts that can be installed in all cars, namely turbo and nitro. Turbo has a turbo boost attribute, while nitro has a capacity attribute.

Create a class diagram so that all cars can install the part and activate it.

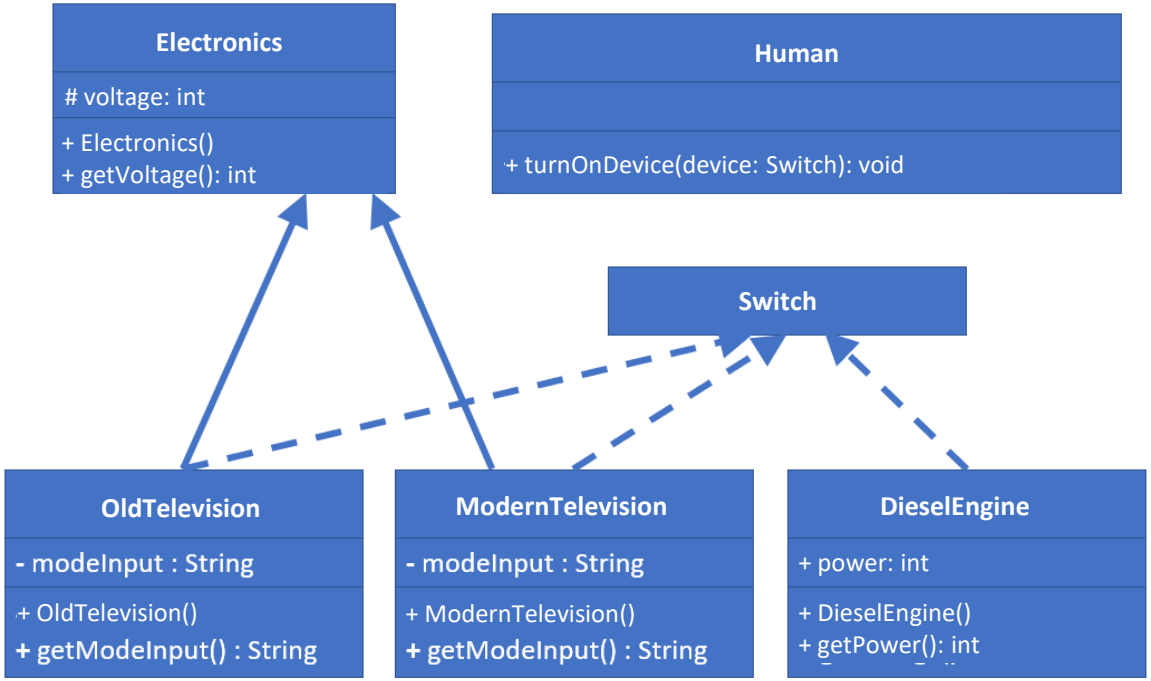


Contoh 4

In the real world, human can turn on any device, as long as it has an on / off switch.

Make a class diagram depicting how humans can turn on old televisions, modern televisions, and diesel engines. Old and modern televisions have something in common, namely that they both have a voltage attribute.

Diesel engines have power attributes.



Exercise 1

A washing machine has several attributes and methods. Its features are: washing, rinsing and drying.

This washing machine has several types, namely front load and top load. The difference between the two is the type of soap that can be used.

Front load uses special soap, while top load uses detergent soap. In addition, front load has a quick wash feature which top load does not have.

Make a class diagram. You are free to define attributes and methods according to the above narrative.

Exercise 2

An adventure game. There are several objects, namely a character that consists of several types: humans, monsters and robots. Each character can attack other characters.

Another object is the background which consists of several types: buildings, trees, mountains.

The next object is a weapon, which consists of missile and gun.

All objects can be destroyed by missile, except mountains. Whereas gun can only destroy humans and monsters.

Thanks!

Any questions?

You can find me at:
rismanto@polinema.ac.id