public class DroneCharacteristics **{**

**//essentials parameters in yellow**

**//grey parameters can be merged into one for simplification, which would be overallPowerTransmissionEfficiency (SI unit : s/m)**

**//All parameters are useful and changing one of them has a direct incidence on the simulation and on the performance measurement result.**

//maxspeed is a function of drag, propeller lift and motor power

private double maxLeaningAngle**;**//degrees, should be positive

private double radius**;**//m

private double motorEfficiency**;**//No unit

private double motorMaxConsumption**;**//W

private double propellerLift**;**//s/m

private double maxPayload**;**//Kg

private double dryWeight**;**//Kg //=empty weight

private double batteryCapacity**;**//W.h=Joules/3600

private double batteryRechargingRate**;**//W

private double communicationRange**;**//m

private double airDrag**;**//Kg/m //air resistance

//maxheight=communication range or map height bound

public DroneCharacteristics**()**

**{**

**this(**DroneType**.**Standard**);**

**}**

public DroneCharacteristics**(**DroneType dt**)**

**{**

setCharacteristics**(**dt**);**

**}**

public void setCharacteristics**(**DroneType dt**)**

**{**

//The max propeller force (=motormaxconso\*motorefficiency\*propellerlift) should at least be equal to 9.81\*dryWeight, otherwise your drone won't even takeoff.

//If you want to carry a payload of mass m, the recommended max propeller force is roughly 20\*(dryweight+m)

//The maxLeaningAngle should ideally be such that when the drone is leaning at that angle with max throttle, its vertical speed is zero.

//Set a smaller angle if you want safety, and a larger if you want fast horizontal speeds

//EXAMPLE FOR PARAMETERS VALUES

//based on DJI Spark

propellerLift**=**0.04**;**

airDrag**=**0.004**;**//airdrag will limit the maxspeed

propellerLift**=**0.035**;**

airDrag**=**0.012**;**

maxLeaningAngle**=**25**;**

radius**=**0.11**;**

motorEfficiency**=**0.85**;**

motorMaxConsumption**=**100**;**//around 10 min autonomy at max throttle

maxPayload**=**0.03**;**

dryWeight**=**0.3**;**

batteryCapacity**=**17**;**

batteryRechargingRate**=**29**;**

communicationRange**=**100**;**

**}**

/\*

\* We assume a linear charge/discharge model, and a potentially infinite instantaneous power delivered from the accumulators.

\*

\* Consumption takes only motors into account, and not electronic or communication components.

\*/

//TODO generate getters / setters

**}**