Time to put all the knowledge from this tutorial together and make a perfect stabilizing E2.

Code:

```
@name Position Stabilizing
@inputs TargetPos:vector E:entity
@persist T [ITerm Error]:vector
@persist GainP GainI GainD

#TargetPos is the position we want to hold prop E at

runOnTick(1)

if(first()) {
    ITerm = vec()
    #those are the values that worked for me - adjust them, if they don't work for you
    GainP = 5
    GainD = 1
    GainI = 4
}

#this will let us calculate DeltaT ($T)
T = curtime()

#calculate error
Error = TargetPos - E:pos()

#calculate P and D terms
PTerm = GainP*Error
DTerm = GainD*$Error/$T

#use I cutoff
if(PTerm:length()<50 & DTerm:length()<10) {
    ITerm += GainI * Error * $T
} else {
    ITerm = vec()
}

#calculate PID output
Out = PTerm + ITerm + DTerm
```

> #apply force
> E:applyForce(Out*E:mass())
>
> I hope that now you understand how PID works and how to make your own self-stabilizing contraptions