"""LFR controller."""

from controller import Robot

robot = Robot()

timestep = int(robot.getBasicTimeStep())

time\_step=32

max\_speed=3

left\_motor = robot.getDevice('left wheel motor')

left\_motor\_2 = robot.getDevice('left wheel motor 2')

right\_motor = robot.getDevice('right wheel motor')

right\_motor\_2 = robot.getDevice('right wheel motor 2')

left\_motor.setPosition(float('inf'))

left\_motor\_2.setPosition(float('inf'))

right\_motor.setPosition(float('inf'))

right\_motor\_2.setPosition(float('inf'))

left\_motor.setVelocity(0.0)

left\_motor\_2.setVelocity(0.0)

right\_motor.setVelocity(0.0)

right\_motor\_2.setVelocity(0.0)

right\_ir=robot.getDevice('RIGHT')

right\_ir.enable(time\_step)

mid\_ir=robot.getDevice('MID')

mid\_ir.enable(time\_step)

left\_ir=robot.getDevice('LEFT')

left\_ir.enable(time\_step)

proportional=integral=derivative=last\_propostional=error\_value=0

sensor\_average=sensor\_sum=position=last\_positon=0

last\_error=0

set\_point=761.6905530832811

kp=0.5

ki=0

kd=0.15

def calc\_turn(left\_motor\_speed, right\_motor\_speed):

right\_motor.setVelocity((right\_motor\_speed))

right\_motor\_2.setVelocity((right\_motor\_speed))

left\_motor.setVelocity((left\_motor\_speed))

left\_motor\_2.setVelocity((left\_motor\_speed))

while robot.step(timestep) != -1:

right\_ir\_val=right\_ir.getValue()

mid\_ir\_val=mid\_ir.getValue()

left\_ir\_val=left\_ir.getValue()

sensors=[left\_ir\_val,mid\_ir\_val,right\_ir\_val]

for i in range(3):

if sensors[i]>700:

sensors[i]=1

else:

sensors[i]=0

sensor\_average=0

sensor\_sum=0

i=0

sensor\_calculator=[-100,0,100]

while i<3:

sensor\_sum=sensor\_sum+(sensors[i]\*sensor\_calculator[i])

i=i+1

error=sensor\_sum

speed\_control= kp\*error+(ki/(error+last\_error+1))+kd\*(error-last\_error)

last\_error=error

left\_motor\_speed=max\_speed+((speed\_control/80)\*5)

right\_motor\_speed=max\_speed-((speed\_control/80)\*5)

calc\_turn(left\_motor\_speed, right\_motor\_speed)

print("left: {} mid: {} right:{}".format(sensors[0],sensors[1],sensors[2]))

pass