

2.4 Visualizing the collisions of molecules each other

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from visual import*
ball1=sphere(pos=vector(-5,-5,0),color=color.red,radius=0.5)
ball2=sphere(pos=vector(5,5,0),color=color.blue,radius=0.5)
wallR=box(pos=(7,0,0),size=(0.2,12,12),color=color.white)
wallL=box(pos=(-5,0,0),size=(0.2,12,12),color=color.white)
wallA=box(pos=(0,0,-3),size=(13,12,0.2),color=color.white)
wallB=box(pos=(0,0,6),size=(12,12,0.2),color=color.white,opacity=0.05)
wallU=box(pos=(1,6,0),size=(12,0.2,12),color=color.white)
wallD=box(pos=(1,-6,0),size=(12,0.2,12),color=color.white)##define walls
ball1.velocity=vector(15,20,10)
ball2.velocity=vector(-15,-10,10) ##define balls
delta_t=0.005
t=0
ball1.trail=curve(color=ball1.color)
ball2.trail=curve(color=ball2.color)##add the trajectory
scene.autoscale=False
while t<10:
    rate(10)
    if ball1.pos.x>wallR.pos.x:
        ball1.velocity.x=-ball1.velocity.x
    if ball1.pos.x<wallL.pos.x:
        ball1.velocity.x=-ball1.velocity.x
    if ball1.pos.y<wallD.pos.y:
        ball1.velocity.y=-ball1.velocity.y
    if ball1.pos.y>wallU.pos.y:
        ball1.velocity.y=-ball1.velocity.y
    if ball1.pos.z<wallA.pos.z:
        ball1.velocity.z=-ball1.velocity.z
    if ball1.pos.z>wallB.pos.z:
        ball1.velocity.z=-ball1.velocity.z
    ball1.pos=ball1.pos+ball1.velocity*delta_t

    if ball2.pos.x>wallR.pos.x:
        ball2.velocity.x=-ball2.velocity.x
    if ball2.pos.x<wallL.pos.x:
        ball2.velocity.x=-ball2.velocity.x
    if ball2.pos.y<wallD.pos.y:
        ball2.velocity.y=-ball2.velocity.y
    if ball2.pos.y>wallU.pos.y:
        ball2.velocity.y=-ball2.velocity.y
    if ball2.pos.z<wallA.pos.z:
        ball2.velocity.z=-ball2.velocity.z
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if ball2.pos.z>wallB.pos.z:
    ball2.velocity.z=-ball2.velocity.z
ball2.pos=ball2.pos+ball2.velocity*delta_t
t=t+delta_t##continuous operation
ball1.trail.append(pos=ball1.pos)
ball2.trail.append(pos=ball2.pos)
if
abs((ball1.pos.x-ball2.pos.x)**2+(ball1.pos.y-ball2.pos.y)**2+(ball1.pos.z-ball2.pos.z)**2)<0.1:
    ball1.velocity,ball2.velocity=ball2.velocity,ball1.velocity##define collision
```