

## Sandbox | CMU CS Academy

```
1 #Gravity
2 app.background= 'black'
3 app.keytime=0
4 for star in range(150):
5     Circle(randrange(10,391),randrange(10,391),1,fill='white')
6 RightTh=Polygon(190,200,200,195,210,198,225,200,210,202,200,205,fill=gradient
7 ('purple','white',start='left'),visible=False)
8 LeftTh=Polygon(210,200,200,195,190,198,175,200,190,202,200,205,fill=gradient
9 ('purple','white',start='right'),visible=False)
10 BottomTh=Polygon(200,190,195,200,198,210,200,225,202,210,205,200,fill=gradient
11 ('purple','white',start='top'),visible=False)
12 TopTh=Polygon(200,210,195,200,198,190,200,175,202,190,205,200,fill=gradient
13 ('purple','white',start='bottom'),visible=False)
14 Player=Circle(200,200,14,fill='gray')
15 Player.dx=0
16 Player.dy=0
17 lasers=Group()
18 app.newrand=0
19 lasers.time=0
20 lasers.int=70
21 death=Group()
22 app.rt=0
23 app.t=0
24 app.explode=False
25 Player.l=1
26 l=Label(app.t,200,50,fill='white',size=20)
27
28 #NEWSTUFF
29 results=Group(
30     Rect(150,275,100,50,fill='lightGrey',border='grey'),
31     Label('Results',200,300,size=20)
32 )
33 results.visible=False
34 Player.distance=0
35 app.dis=[0]
36
37 def addLaser(dir):
38     app.newrand=randrange(1,400)
39     if(dir==0):
40         lasers.add(Line(app.newrand,0,app.newrand,1,fill='red',lineWidth=3,dashes=(3,6)))
41     if(dir==1):
42         lasers.add(Line(0,app.newrand,1,app.newrand,fill='red',lineWidth=3,dashes=(3,6)))
43     if(dir==2):
44         lasers.add(Line(app.newrand,400,app.newrand,399,fill='red',lineWidth=3,dashes=(3,6)))
45     if(dir==3):
46         lasers.add(Line(400,app.newrand,399,app.newrand,fill='red',lineWidth=3,dashes=(3,6)))
47 def DeathTime(x,y):
48     if((x==0)or(x==400)):
49         death.add(Line(0,y,400,y,fill='red',lineWidth=2))
50     if((y==0)or(y==400)):
51         death.add(Line(x,0,x,400,fill='red',lineWidth=2))
52 def onKeyHold(keys):
53     if(('left' in keys)and(Player.dx>-7)):
54         Player.dx-=.2
55         if app.explode==False:
56             RightTh.visible=True
57     else:
58         RightTh.visible=False
59     if(('right' in keys)and(Player.dx<7)):
60         Player.dx+=.2
61         if app.explode==False:
62             LeftTh.visible=True
63     else:
64         LeftTh.visible=False
65     if(('up' in keys)and(Player.dy>-7)):
66         Player.dy-=.2
67         if app.explode==False:
68             BottomTh.visible=True
69     else:
70         BottomTh.visible=False
71     if(('down' in keys)and(Player.dy<7)):
72         Player.dy+=.2
73         if app.explode==False:
```

```

74         TopTh.visible=True
75     else:
76         TopTh.visible=False
77 def explode():
78     lasers.int=0
79     Player.visible=False
80     app.explode=True
81     Label('Game Over',200,200,fill='white',size=50)
82     Player.l=0
83     results.visible=True
84 def onStep():
85     app.rt+=1
86     l.value=app.t
87     if((app.rt>=30)and(Player.visible==True)):
88         app.rt=0
89         app.t+=1
90         app.dis.append(Player.distance)
91     app.keytime+=1
92     if(app.keytime==6):
93         app.keytime=0
94         onKeyHold('o')
95     lasers.time+=1
96     if(lasers.time>=lasers.int):
97         addLaser(randrange(0,4))
98         lasers.time=0
99         if(lasers.int>10):
100             lasers.int-=1
101     RightTh.left=Player.centerX
102     RightTh.centerY=Player.centerY
103     LeftTh.right=Player.centerX
104     LeftTh.centerY=Player.centerY
105     BottomTh.top=Player.centerY
106     BottomTh.centerX=Player.centerX
107     TopTh.bottom=Player.centerY
108     TopTh.centerX=Player.centerX
109     Player.centerX+=Player.dx
110     Player.centerY+=Player.dy
111
112     Player.distance+=abs(Player.dx)
113     Player.distance+=abs(Player.dy)
114
115     if((Player.centerX>=414)and(Player.dx>0)):
116         Player.centerX=-14
117     if((Player.right<=0)and(Player.dx<0)):
118         Player.centerX=414
119     if((Player.centerY>=414)and(Player.dy>0)):
120         Player.centerY=-14
121     if((Player.bottom<=0)and(Player.dy<0)):
122         Player.centerY=414
123     for laser in lasers.children:
124         if(laser.y1==0):
125             laser.y2+=5
126         if(laser.x1==0):
127             laser.x2+=5
128         if(laser.y1==400):
129             laser.y2-=5
130         if(laser.x1==400):
131             laser.x2-=5
132         if((laser.y2>=400)or(laser.x2>=400)or(laser.y2<=0)or(laser.x2<=0)):
133             DeathTime(laser.x1,laser.y1)
134             lasers.remove(laser)
135     for dead in death.children:
136         if((dead.lineWidth>1)and(dead.fill=='red')):
137             dead.lineWidth+=1
138             if(dead.lineWidth==15):
139                 dead.fill='crimson'
140         elif((dead.fill=='crimson')and(dead.lineWidth>1)):
141             dead.lineWidth-=1
142         elif(dead.lineWidth==1):
143             death.remove(dead)
144     if((Player.hitsShape(death)==True)and(Player.l==1)):
145         explode()
146         results.visible=True
147
148 def onMousePress(mouseX,mouseY):
149     if (results.hits(mouseX,mouseY)==True)and results.visible==True:

```

```
150 Rect(0,0,400,400,fill='white')
151 Label('Results',200,50,size=30)
152 Label('Time:',75,100)
153 Label(app.t,200,100)
154 Label('Total Distance:',75,120)
155 Label(rounded(Player.distance),200,120)
156 Label('Time (sec)',200,395)
157 Label('Distance Traveled (Pixels)',75,160)
158 for point in range(len(app.dis)):
159     Circle((380/len(app.dis))*point+30,380-
160            ((app.dis[point]/app.dis[len(app.dis)-1])*200),4)
161     Line((380/len(app.dis))*point+30,380,(380/len(app.dis))*point+30,180,
162          lineWidth=1)
163     Line(30,380-((app.dis[point]/app.dis[len(app.dis)-1])*200),
164          380,380-((app.dis[point]
165                 /app.dis[len(app.dis)-1])*200),lineWidth=1)
166     Label(point,(380/len(app.dis))*point+30,387)
167     Label(rounded(app.dis[point]),15,
168           380-((app.dis[point]/app.dis[len(app.dis)-1])*200))
```