

Assignment 7
Vaibhav Sharma
200365101

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58
59 def euler(f,y0,a,b,h):
60     t,y = a,y0
61     while t <= b:
62         print ("%6.3f %6.3f" % (t,y))
63         t += h
64         y += h * f(t,y)
65
66
67
68 def rk4(f, x0, y0, x1, n):
69     vx = [0] * (n + 1)
70     vy = [0] * (n + 1)
71     h = (x1 - x0) / float(n)
72     vx[0] = x = x0
73     vy[0] = y = y0
74     for i in range(1, n + 1):
75         k1 = h * f(x, y)
76         k2 = h * f(x + 0.5 * h, y + 0.5 * k1)
77         k3 = h * f(x + 0.5 * h, y + 0.5 * k2)
78         k4 = h * f(x + h, y + k3)
79         vx[i] = x = x0 + i * h
80         vy[i] = y = y0 + (k1 + k2 + k2 + k3 + k3 + k4) / 6
81     return vx, vy
82
83 def f(x, y):
84     return x * sqrt(y)
85
86 vx, vy = rk4(f, 0, 1, 10, 100)
87 for x, y in list(zip(vx, vy))[:10]:
88     print("%4.1f %10.5f %12.4e" % (x, y, y - (4 + x * x)**2 / 16))
89
```

Answer - 1

I took this code from https://rosettacode.org/wiki/Runge-Kutta_method#Alternate_solution.
It's their original work. I am unable to figure out how to cite code otherwise

Answer 2 -

IN Forceball.py

I applied gravity on mobject by
g = Vector(0,0,-9.8)
mobject.applyForce(g)

And ran it twice by euler and rk4 but for some reason my log function was not population the data.txt file(macUser). I check the path was correct so I am just submitting this without the graph for now.