Exercise_2_1

November 19, 2019

[1]:
```
from numpy import *
from IPython.display import Image
```

[2]:
```
Image('2_1_Theory.png')
```

[2]:

Fall time

We can solve for the time of fall by starting from Newtons 2nd law, and solving for the time when h(t)=0 if dropped from an initial height under the influence of gravity.

$$F_{net} = ma$$
$$F_g = ma$$
$$mg = ma$$
$$g = a = \frac{dv}{dt}$$
$$\int gdt = \int dv$$
$$v = gt + v_0,\ v_0 = 0$$
$$\frac{dh}{dt} = gt$$
$$\int dh = \int gtdt$$
$$h(t) = \frac{1}{2}gt^2 + h_0$$
$$h(t) = 0$$
$$t = \sqrt{\frac{2h_0}{g}}$$

[5]:
```
#declare variables
g = 9.81
h0 = float(input('Enter the initial height in meters:'))
```

```
Enter the initial height in meters: 100
```

[6]:
```
t = sqrt((2*h0)/g)
print('The fall time is:',t,'s')
```

```
The fall time is: 4.515236409857309 s
```