**Tutorial- 2**

**Ques 1**

f=input('enter temperature in degrees F:-');

c=(5/9)\*(f-32);

disp('temperature in degee c');

disp(c);

Untitled2

enter temperature in degrees F:-45

temperature in degee c

7.2222

**Ques 2**

a. clc

m0=input('enter the initial mass of the rocket m0=');

u=input('Enter the exhaust velocity of burned fuel u=');

q=input('Enter the rate at which the rocket burns fuel q=');

g=9.81;

t=10;

v=u\*log(m0/(m0-(q\*t)))-(g\*t);

h=(u/g)\*(m0-(q\*t))\*log(m0-(q\*t))+(u\*(log(m0)+1))\*t-(g/2\*(t^2))-m0\*u\*log(m0)/q;

fprintf('%4s %4f%3s %6f\n','velocity at time ',t,'is',v);

fprintf('%4s %4f%3s %6f\n','Height at time ',t,'is',h);

Untitled3

enter the initial mass of the rocket m0=500

Enter the exhaust velocity of burned fuel u=25

Enter the rate at which the rocket burns fuel q=2

velocity at time 10.000000 is -97.079450

Height at time 10.000000 is -485.431967

b. m0=input('enter the initial mass of the rocket m0=');

u=input('Enter the exhaust velocity of burned fuel u=');

q=input('Enter the rate at which the rocket burns fuel q=');

g=9.81;

t=0:5:100;

v=u.\*log(m0./(m0-(q.\*t)))-(g.\*t);

h=(u/q).\*(m0-(q.\*t)).\*log(m0-(q.\*t))+(u\*(log(m0)+1)).\*t-(g/2.\*(t.^2))-m0\*u\*log(m0)/q;

a=[t;v;h];

fid=fopen('rocketmotion12.table','w');

fprintf(fid,'%25s\n','rocket motion');

fprintf(fid,'%4s %11s %13s\n','time','speed','height');

fprintf(fid,'%2.0f %12.2f %14.2f\n',a);

fclose(fid);

rocket motion

time speed height

0 0.00 0.00

5 -48.54 -121.37

10 -97.08 -485.43

15 -145.60 -1092.14

20 -194.12 -1941.44

25 -242.62 -3033.28

30 -291.10 -4367.58

35 -339.58 -5944.30

40 -388.04 -7763.36

45 -436.49 -9824.69

50 -484.92 -12128.22

55 -533.34 -14673.87

60 -581.74 -17461.58

65 -630.12 -20491.24

70 -678.49 -23762.77

75 -726.83 -27276.08

80 -775.16 -31031.07

85 -823.46 -35027.63

90 -871.74 -39265.65

95 -920.00 -43745.01

100 -968.23 -48465.60

Untitled4

enter the initial mass of the rocket m0=500

Enter the exhaust velocity of burned fuel u=25

Enter the rate at which the rocket burns fuel q=2

c. m0=input('enter the initial mass of the rocket m0=');

u=input('Enter the exhaust velocity of burned fuel u=');

q=input('Enter the rate at which the rocket burns fuel q=');

g=9.81;

t=0:5:100;

v=u.\*log(m0./(m0-(q.\*t)))-(g.\*t);

h=(u/q).\*(m0-(q.\*t)).\*log(m0-(q.\*t))+(u\*(log(m0)+1)).\*t-(g/2.\*(t.^2))-m0\*u\*log(m0)/q;

plot(t,v,t,h)

title('rocket motion')

xlabel('time')

ylabel('speed and height')

legend('speed','height')



d. m0=input('enter the initial mass of the rocket m0=');

u=input('Enter the exhaust velocity of burned fuel u=');

q=input('Enter the rate at which the rocket burns fuel q=');

g=9.81;

t=0:5:100;

v=u.\*log(m0./(m0-(q.\*t)))-(g.\*t);

a=v./t;

disp('the acceleration is');

disp(a')

Untitled8

enter the initial mass of the rocket m0=500

Enter the exhaust velocity of burned fuel u=25

Enter the rate at which the rocket burns fuel q=2

the acceleration is

NaN

-9.7090

-9.7079

-9.7069

-9.7058

-9.7046

-9.7035

-9.7023

-9.7010

-9.6997

-9.6984

-9.6971

-9.6957

-9.6942

-9.6927

-9.6911

-9.6895

-9.6878

-9.6860

-9.6842

-9.6823

m0=input('enter the initial mass of the rocket m0=');

u=input('Enter the exhaust velocity of burned fuel u=');

q=input('Enter the rate at which the rocket burns fuel q=');

g=9.81;

t=0:5:100;

v=u.\*log(m0./(m0-(q.\*t)))-(g.\*t);

a=diff(v);

disp('the acceleration is');

disp(a')

Untitled9

enter the initial mass of the rocket m0=500

Enter the exhaust velocity of burned fuel u=25

Enter the rate at which the rocket burns fuel q=2

the acceleration is

-48.5449

-48.5345

-48.5237

-48.5123

-48.5005

-48.4882

-48.4753

-48.4617

-48.4476

-48.4327

-48.4171

-48.4006

-48.3833

-48.3650

-48.3457

-48.3253

-48.3037

-48.2807

-48.2563

-48.2303