**Q1:-** The population of a certain country is 50 million and is expected to double in 20 years. Calculate the population 5, 10, and 15 years from now by defining a vector t with 3 elements and using element by element calculation. Population growth can be modeled by the equation P=P02t/d, where P is the population at time t, P0 is the population at t=0, and d is the doubling time.

Solution:-

**%Create a script file with name population.m**

p0=50;

t=[5,10,15];

d=20;

yr=2012:5:2022;

P = p0.\*(2.^(t./d));

p=fix(P);

table(:,1)=yr';

table(:,2)=p';

disp(' Year Population(million)')

disp('')

disp(table)

**>> population**

## Output:-

Year Population(million)

2012 59

2017 70

2022 84

**Q2**:- Write a script file that determines the balance in a saving account at the end of every year for the first 10 years. The account has an initial investment of 1000 and interest rate of 6.5% that compounds annually. Display the information in a table. For an initial investment of A, and interest rate of r, the balance B after n year is given by:

# B=A(1+r/100)n

Solution:-

**%Create a script file with name balance.m**

yr=1:10;

A = 1000;

r=6.5;

B=A.\*(1+(r/100)).^n;

fprintf('\tYears(s)\tBalance')

fprintf('\n\t%d\t\t\t%.4f',[yr;B])

disp(' ')

**>> balance**

## Output:-

Years(s) Balance

1 1065.0000

2 1134.2250

3 1207.9496

4 1286.4664

5 1370.0867

6 1459.1423

7 1553.9865

8 1654.9957

9 1762.5704

10 1877.1375

**Q3:-** The velocity, v, and the distance, d, as a function time, of a car that accelerates from rest at constant acceleration, a, are given by:

v(t)= at and *d*(*t*) = 1/2 *at2*

Determine **v** and **d** as every second for the first 10 seconds for a car with acceleration of a=1.55 m/s2. Display the results in a three-column table in which the first column is time (s), the second distance (m), and the third is velocity (km/h).

Solution:-

**%Create a script file with name velocity.m**

a=1.55;

t=1:10;

v=a.\*t;

d=((1/2)\*a).\*(t.^2);

kmh = v.\*3.6;

fprintf('\n\tTime(s)\tDistance(m)\tVelocity(km/h)')

fprintf('\n\t%d\t\t%.2f\t\t%.4f',[t;d;kmh])

disp(' ')

**>> velocity**

## Output:-

Time(s) Distance(m) Velocity(km/h)

1 0.78 5.5800

2 3.10 11.1600

3 6.98 16.7400

4 12.40 22.3200

5 19.38 27.9000

6 27.90 33.4800

7 37.98 39.0600

8 49.60 44.6400

9 62.77 50.2200

10 77.50 55.8000