```
%Name: Pawan Raju Baisane
%Class: TY - A - 03
%Runge Kutta 2nd Order Method
clc;
clear all;
close all;
f=input('\nEnter the function (dy/dx)= ');
x0=input('\nEnter the initial value x0= ');
y0=input('\nEnter the initial value y0= ');
h=input('\nEnter the step size h= ');
xg=input('\nEnter the final value xg= ');

n=(xg-x0)/h;
for i=1:n
    k1=h*f(x0,y0);
    k2=h*f(x0+h,y0+k1);
    k=(k1+k2)/2;
    yg=y0+k;
    x0=x0+h;
    y0=yg;
    fprintf('\nyg=%f ',yg);
end
```

Output:

```
Enter the function (dy/dx)=
@(x,y)(x*x+y*y)
Enter the initial value x0=
0
Enter the initial value y0=
0
Enter the step size h=
0.2
Enter the final value xg=
0.4
yg=0.004000
yg=0.024016

[x,y]=ode45(f,[0:0.2:0.4],0)

x =

         0
    0.2000
    0.4000

y =
         0
    0.0027
    0.0214
```