```
clc
clear all
y0=.5;a=0;h=.2;b=2;n=(b-a)/h;e=a:h:b;
for i=1:4
    [~,y1]=RK2(y0,a,b,h);
    [~,y2]=RK2(y0,a,b,h);
    [t,y3]=RK2(y0,a,b,h);
end

for i=4:n
    y1(i+1)=y1(i) +h/24*(    55*f(t(i),y1(i))  -59*f(t(i-1),y1(i-1))+37*f(t(i-2),y1
    y2(i+1)=y2(i) +h/24*(9*f(t(i+1),y2(i+1))  +19*f(t(i),y2(i))    -5*f( t(i-1),y2
    y3(i+1)=y3(i) +h/24*(9*f(t(i+1),y2(i+1))  +19*f(t(i),y3(i))    -5*f( t(i-1),y3
end
disp('    t              Ex            AB            AM            CP')
disp('============================================================')
for i=1:n+1
    e(i)=(t(i)+1)^2-exp(t(i))/2;
    e1(i)=abs(e(i)-y1(i));
    e2(i)=abs(e(i)-y2(i));
    e3(i)=abs(e(i)-y3(i));
    fprintf('%f      %f      %f      %f      %f\n',t(i),e(i),y1(i),y2(i),y3(i))
end
plot(t,y1,'.',t,y2,'d-',t,y3,'o-')
hold on
disp('============================================================')
disp('    t              Ex            AB            AM            CP')
disp('============================================================')
for i=1:n+1
    fprintf('%f      %f      %f      %f      %f\n',t(i),e(i),e1(i),e2(i),e3(i))
end
plot(t,e,t,e1,'*-',t,e2,'d-',t,e3,'o-')
gtext('Values');
gtext('Errors');
hold off

%%%%%%%%%%%%%%Output%%%%%%%%%%%%%%%
```
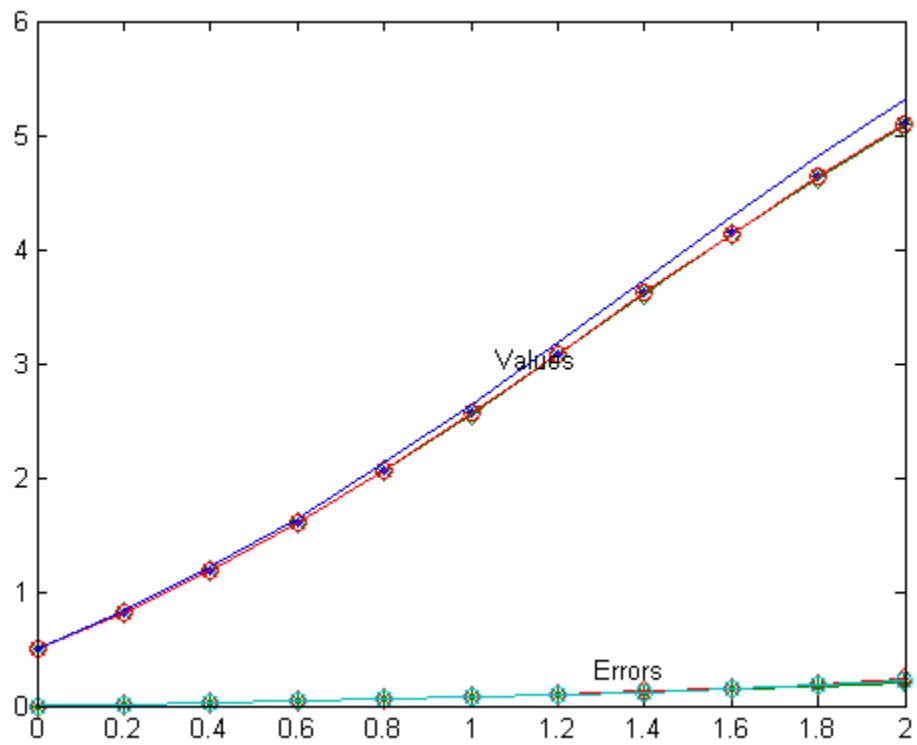
```
          t           Ex           AB           AM           CP
     ============================================================
     0.000000    0.500000    0.500000    0.500000    0.500000
     0.200000    0.829299    0.814000    0.814000    0.814000
     0.400000    1.214088    1.181540    1.181540    1.181540
     0.600000    1.648941    1.597063    1.597063    1.597063
     0.800000    2.127230    2.062944    2.062856    2.063532
     1.000000    2.640859    2.563828    2.560892    2.562960
     1.200000    3.179942    3.085781    3.080327    3.084448
     1.400000    3.732400    3.617176    3.608478    3.615194
     1.600000    4.283484    4.143000    4.129874    4.139513
     1.800000    4.815176    4.643925    4.625723    4.638269
     2.000000    5.305472    5.096611    5.073218    5.088133
     ============================================================
```

t	Ex	AB	AM	CP
0.000000	0.500000	0.000000	0.000000	0.000000
0.200000	0.829299	0.015299	0.015299	0.015299
0.400000	1.214088	0.032548	0.032548	0.032548
0.600000	1.648941	0.051877	0.051877	0.051877
0.800000	2.127230	0.064286	0.064373	0.063698
1.000000	2.640859	0.077031	0.079967	0.077899
1.200000	3.179942	0.094160	0.099615	0.095494
1.400000	3.732400	0.115224	0.123922	0.117206
1.600000	4.283484	0.140484	0.153610	0.143971
1.800000	4.815176	0.171252	0.189453	0.176907
2.000000	5.305472	0.208861	0.232254	0.217339

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