Contents

Forward Euler

```
clc;
clear;
close all;
```

Forward Euler

```
dt = 0.01;
t = 0;
d=10;
x(1) = 1;
y(1) = 1;
z(1) = 1;
Nsteps = 100;
fprintf('t\tx\ty\n')
for i = 1:Nsteps-1
   fprintf('%f\t%f\t%f\t%f\n',t(i),x(i),y(i),z(i));
       x(i+1) = x(i) + dt*((x(i)-d)/((x(i)-d) + y(i) + z(i)));
       y(i+1) = y(i) + dt*(y(i)/((x(i)-d) + y(i) + z(i)));
        z(i+1) = z(i) + dt*(z(i)/((x(i)-d) + y(i) + z(i)));
        t(i+1) = t(i) + dt;
end
    plot(x,y);
    hold on;
xlabel('x')
ylabel('y')
title('$ok$; x(0)=y(0)=1','Interpreter','Latex');
```

```
t
        Х
                У
0.000000
                                                  1.000000
                1.000000
                                 1.000000
0.010000
                1.012857
                                 0.998571
                                                  0.998571
0.020000
                1.025714
                                 0.997143
                                                  0.997143
                                 0.995714
                                                  0.995714
0.030000
                1.038571
                                 0.994286
                                                 0.994286
0.040000
                1.051429
0.050000
                1.064286
                                 0.992857
                                                 0.992857
0.060000
                1.077143
                                 0.991429
                                                  0.991429
0.070000
                1.090000
                                 0.990000
                                                  0.990000
0.080000
                1.102857
                                 0.988571
                                                 0.988571
0.090000
                1.115714
                                 0.987143
                                                 0.987143
0.100000
                1.128571
                                 0.985714
                                                  0.985714
0.110000
                1.141429
                                 0.984286
                                                 0.984286
0.120000
                1.154286
                                 0.982857
                                                 0.982857
0.130000
                1.167143
                                 0.981429
                                                 0.981429
0.140000
                1.180000
                                 0.980000
                                                  0.980000
0.150000
                1.192857
                                 0.978571
                                                 0.978571
0.160000
                1.205714
                                 0.977143
                                                 0.977143
0.170000
                                                 0.975714
                1.218571
                                 0.975714
```

0.180000	1.231429	0.974286	0.974286
0.190000	1.244286	0.972857	0.972857
0.200000	1.257143	0.971429	0.971429
0.210000	1.270000	0.970000	0.970000
0.220000	1.282857	0.968571	0.968571
0.230000	1.295714	0.967143	0.967143
0.240000	1.308571	0.965714	0.965714
0.250000	1.321429	0.964286	0.964286
0.260000	1.334286	0.962857	0.962857
		0.962837	
0.270000	1.347143		0.961429
0.280000	1.360000	0.960000	0.960000
0.290000	1.372857	0.958571	0.958571
0.300000	1.385714	0.957143	0.957143
0.310000	1.398571	0.955714	0.955714
0.320000	1.411429	0.954286	0.954286
0.330000	1.424286	0.952857	0.952857
0.340000	1.437143	0.951429	0.951429
0.350000	1.450000	0.950000	0.950000
0.360000	1.462857	0.948571	0.948571
0.370000	1.475714	0.947143	0.947143
0.380000	1.488571	0.945714	0.945714
0.390000	1.501429	0.944286	0.944286
0.400000	1.514286	0.942857	0.942857
0.410000	1.527143	0.941429	0.941429
0.420000	1.540000	0.940000	0.940000
0.430000	1.552857	0.938571	0.938571
0.440000	1.565714	0.937143	0.937143
0.450000	1.578571	0.935714	0.935714
0.460000	1.591429	0.934286	0.934286
0.470000	1.604286	0.932857	0.932857
0.480000	1.617143	0.931429	0.931429
0.490000	1.630000	0.930000	0.930000
0.500000	1.642857	0.928571	0.928571
0.510000	1.655714	0.927143	0.927143
0.520000	1.668571	0.925714	0.925714
0.530000	1.681429	0.923714	0.923714
0.540000			
	1.694286	0.922857	0.922857
0.550000	1.707143	0.921429	0.921429
0.560000	1.720000	0.920000	0.920000
0.570000	1.732857	0.918571	0.918571
0.580000	1.745714	0.917143	0.917143
0.590000	1.758571	0.915714	0.915714
0.600000	1.771429	0.914286	0.914286
0.610000	1.784286	0.912857	0.912857
0.620000	1.797143	0.911429	0.911429
0.630000	1.810000	0.910000	0.910000
0.640000	1.822857	0.908571	0.908571
0.650000	1.835714	0.907143	0.907143
0.660000	1.848571	0.905714	0.905714
0.670000	1.861429	0.904286	0.904286
0.680000	1.874286	0.902857	0.902857
0.690000	1.887143	0.901429	0.901429
0.700000	1.900000	0.900000	0.900000
0.710000	1.912857	0.898571	0.898571
0.720000	1.925714	0.897143	0.897143
0.730000	1.938571	0.895714	0.895714
0.740000	1.951429	0.894286	0.894286
0.750000	1.964286	0.892857	0.892857
0.760000	1.977143	0.891429	0.891429
0.770000	1.990000	0.890000	0.890000
0.780000	2.002857	0.888571	0.888571

0.790000	2.015714	0.887143	0.887143
0.800000	2.028571	0.885714	0.885714
0.810000	2.041429	0.884286	0.884286
0.820000	2.054286	0.882857	0.882857
0.830000	2.067143	0.881429	0.881429
0.840000	2.080000	0.880000	0.880000
0.850000	2.092857	0.878571	0.878571
0.860000	2.105714	0.877143	0.877143
0.870000	2.118571	0.875714	0.875714
0.880000	2.131429	0.874286	0.874286
0.890000	2.144286	0.872857	0.872857
0.900000	2.157143	0.871429	0.871429
0.910000	2.170000	0.870000	0.870000
0.920000	2.182857	0.868571	0.868571
0.930000	2.195714	0.867143	0.867143
0.940000	2.208571	0.865714	0.865714
0.950000	2.221429	0.864286	0.864286
0.960000	2.234286	0.862857	0.862857
0.970000	2.247143	0.861429	0.861429
0.980000	2.260000	0.860000	0.860000

