

Problem4A

November 17, 2016

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In [1]: function euler(t,h)
        y = t -> t^(3/2)
        return y + h*y
    end
```

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Out[1]: euler (generic function with 1 method)
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In [20]: h=0.1
        ts = 0:h:3
        n = length(ts)
        y = zeros(n,1)
        actual = zeros(n,1)
        @printf("Time \t Approx \t Exact \t\t Error Percent \n")
        @printf("%d \t %.8f \t %.8f \t %.4f\n", ts[1], y[1], actual[1], abs(actual[1]-y[1]))
        for i=2:n
            y[i] = euler(ts[i],h)
            actual[i]=ts[i]^(3/2)
            @printf("%.2f \t %.8f \t %.8f \t %.4f\n", ts[i], y[i], actual[i], abs(actual[i]-y[i])/actual[i])
        end
```

Time	Approx	Exact	Error Percent
0	0.00000000	0.00000000	0.0000
0.10	0.11000000	0.03162278	247.8505
0.20	0.22000000	0.08944272	145.9675
0.30	0.33000000	0.16431677	100.8316
0.40	0.44000000	0.25298221	73.9253
0.50	0.55000000	0.35355339	55.5635
0.60	0.66000000	0.46475800	42.0094
0.70	0.77000000	0.58566202	31.4751
0.80	0.88000000	0.71554175	22.9837
0.90	0.99000000	0.85381497	15.9502
1.00	1.10000000	1.00000000	10.0000
1.10	1.21000000	1.15368973	4.8809
1.20	1.32000000	1.31453414	0.4158
1.30	1.43000000	1.48222805	3.5236
1.40	1.54000000	1.65650234	7.0330
1.50	1.65000000	1.83711731	10.1854
1.60	1.76000000	2.02385770	13.0374
1.70	1.87000000	2.21652882	15.6339
1.80	1.98000000	2.41495342	18.0108
1.90	2.09000000	2.61896926	20.1976
2.00	2.20000000	2.82842712	22.2183
2.10	2.31000000	3.04318912	24.0928
2.20	2.42000000	3.26312733	25.8380

2.30	2.53000000	3.48812270	27.4681
2.40	2.64000000	3.71806401	28.9953
2.50	2.75000000	3.95284708	30.4299
2.60	2.86000000	4.19237403	31.7809
2.70	2.97000000	4.43655272	33.0561
2.80	3.08000000	4.68529615	34.2624
2.90	3.19000000	4.93852205	35.4058
3.00	3.30000000	5.19615242	36.4915

```
In [21]: using Plots
          plot(actual,ts,label="actual")
          plot!(y,ts,label="Euler")
```

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In [22]: savefig("problem4A.png")
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In [ ]:
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