# Swapnil Daxini (V00861672) CSC349A Assignment 6

## Contents

## Question 3

### Part A

```
type trap.m
```

```
function trap(a, b, maxiter, tol, f)
m = 1;
x = linspace(a, b, m+1);
y = f(x);
approx = trapz(x, y);
disp('     m      integral approximation');
fprintf('  %5.0f %16.10f \n ', m, approx);

for i = 1 : maxiter
    m = 2^i;
    oldapprox = approx;
    x = linspace ( a, b, m+1) ;
    y = f(x);
    approx = trapz(x, y);

    fprintf(' %5.0f %16.10f \n ', m, approx);
    if abs(approx - oldapprox) < tol
        return
    end
end
fprintf('Did not converge in %g iterations', maxiter)
```

### Part B

```
type f1.m

% Solve first integral
trap(0.1, 3, 20, 10^-6, @f1)

type f2.m

% Solve second integral
trap(0, 1, 20, 10^-10, @f2)
```

```
function y = f1(x)

    y = sin(1./x);

end
```

```
    m       integral approximation
    1      -0.3143983004
    2       0.7147254605
    4       1.3447434609
    8       1.5589483255
   16       1.4776583126
   32       1.4679626280
   64       1.5197926883
  128       1.5355585774
  256       1.5386514853
  512       1.5393496800
 1024       1.5395196356
 2048       1.5395618423
 4096       1.5395723764
 8192       1.5395750089
16384       1.5395756669
```

```
function y = f2(x)

    y = exp(3.*x)./sqrt(x.^3+1);

end
```

```
      m       integral approximation
      1       7.6013096811
      2       5.9133433291
      4       5.4710046573
      8       5.3585418274
     16       5.3303053079
     32       5.3232385483
     64       5.3214713803
    128       5.3210295584
    256       5.3209191010
    512       5.3208914866
   1024       5.3208845830
   2048       5.3208828571
   4096       5.3208824256
   8192       5.3208823177
  16384       5.3208822908
  32768       5.3208822840
  65536       5.3208822823
 131072        5.3208822819
 262144        5.3208822818
 524288        5.3208822818
```

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