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Lab8Simons.m

Madilyn Simons

```
clc; clear;
```

Problem 1a

Approximate the solution of a Fredholm integral equation using the Composite Trapezoidal rule

```
% Given values for a, b, f(x), K(x, t), and n
a = 0;
b = 1;
f = @(x) x.^2;
K = @(x, t) exp(abs(x - t));
n = 4;

% Solve for u(x)
u = trapezoidal(a, b, f, K, n);

% Print the results
fprintf('Problem 1a (Trapezoidal Rule)\n');
for i=1:n+1
    fprintf('u(x%d) = %f\n', i-1, u(i));
end
```

```
Problem 1a (Trapezoidal Rule)
u(x0) = -1.154255
u(x1) = -0.909330
u(x2) = -0.715314
u(x3) = -0.547295
u(x4) = -0.393126
```

Problem 1b

Approximate the solution of a Fredholm integral equation using the Composite Simpson's rule

```
% Given values for a, b, f(x), K(x, t), and n
a = 0;
b = 1;
f = @(x) x.^2;
K = @(x, t) exp(abs(x - t));
```

```
n = 4;

% Solve for u(x)
u = simpsons(a, b, f, K, n);

% Print the results
fprintf('Problem 1b (Simpsons Rule)\n');
for i=1:n+1
    fprintf('u(x%d) = %f\n', i-1, u(i));
end
```

```
Problem 1b (Simpsons Rule)
u(x0) = -1.234286
u(x1) = -0.950729
u(x2) = -0.765940
u(x3) = -0.584474
u(x4) = -0.448498
```

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