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Part 1

Use Composite Trapezoidal and Composite Simpson's Rules to solve Fredholm Integral Equation of the second kind

```
fprintf("Part 1\n");
```

```
Part 1
```

Section A

```
fprintf("Section A\n");

a = 0;
b = 1;
f = @(x) x.^2;
K = @(x, t) exp(abs(x-t));
m = 4;

h = (b-a)/m;
x = a + h*(0:m);
x = x';

A = [ h/2*K(x(1:end),x(1)), h*K(x(1:end),x(2:end-1)'),
 h/2*K(x(1:end),x(end)) ];

A = A - eye(size(A,1));

u = A\-f(x)
```

```
Section A

u =

   -1.1543
   -0.9093
   -0.7153
   -0.5473
   -0.3931
```

Section B

```
fprintf("Section B\n");
```

```
a = 0;
b = 1;
f = @(x) x.^2;
K = @(x, t) exp(abs(x-t));
m = 4;

h = (b-a)/m;
x = a + h*(0:m);
x = x';

A = [ h/3*K(x(1:end),x(1)), h/3*K(x(1:end),x(2:end-1)'),
 h/3*K(x(1:end),x(end)) ];

for i = 2:size(A,1)-1
    if mod(i, 2) == 0
        A(:,i) = 2*A(:,i);
    else
        A(:,i) = 4*A(:,i);
    end
end
A = A - eye(size(A,1));

u = A\-f(x)
```

```
Section B

u =

   -2.5940
   -2.0669
   -1.7226
   -1.6674
   -1.7677
```

Section C

```
fprintf("Section C\n");

a = 0;
b = 1;
f = @(x) x.^2;
K = @(x, t) exp(abs(x-t));
m = 10;

h = (b-a)/m;
x = a + h*(0:m);
x = x';

A = [ h/2*K(x(1:end),x(1)), h*K(x(1:end),x(2:end-1)'),
 h/2*K(x(1:end),x(end)) ];
```

```
A = A - eye(size(A,1));

u = A\-f(x)
```

```
Section C

u =

   -1.1889
   -1.0777
   -0.9789
   -0.8900
   -0.8087
   -0.7332
   -0.6624
   -0.5950
   -0.5304
   -0.4681
   -0.4080
```

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