Swapnil Daxini (V00861672) Assignment 5

Contents

Question 3

Part A

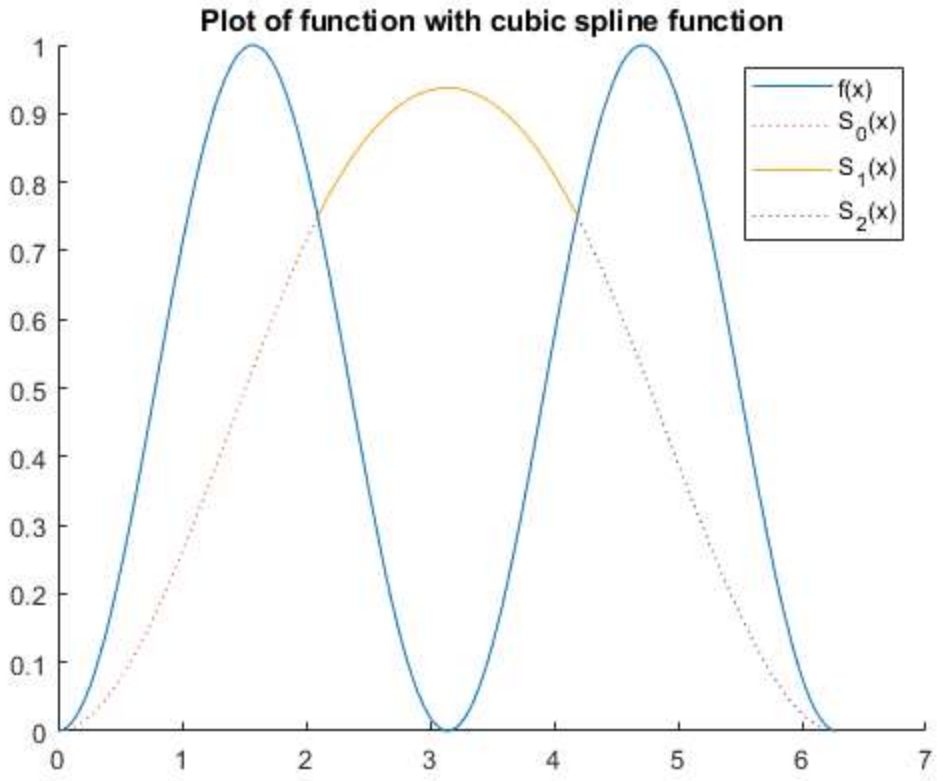
```
X = [0 2*pi/3 4*pi/3 2*pi];

% Note the first and last entries are 0 which are our clamped boundary
% conditions
Y = [0 0 0.75 0.75 0 0];

pp = spline(X, Y);

format short;

[b, c] = unmkpp( pp )
```

```
b =

         0    2.0944    4.1888    6.2832


c =

   -0.0816    0.3420         0         0
    0.0000   -0.1710    0.3581    0.7500
    0.0816   -0.1710   -0.3581    0.7500
```

Part B

```
hold on;
x = linspace(0, 2*pi, 150);
y = sin(x).^2;
plot(x, y)

X1 = linspace(0, 2*pi/3, 50);
Y1 = c(1,1)*X1.^3 + c(1,2)*X1.^2 + c(1,3)*X1 + c(1,4);
plot(X1, Y1, ':')

X2 = linspace(2*pi/3, 4*pi/3, 50);
Y2 = c(2,1)*(X2 - 2*pi/3).^3 + c(2,2)*(X2 - 2*pi/3).^2 + c(2,3)*(X2 - 2*pi/3) + c(2,4);
plot(X2, Y2, '-')

X3 = linspace(4*pi/3, 2*pi, 50);
Y3 = c(3,1)*(X3 - 4*pi/3).^3 + c(3,2)*(X3 - 4*pi/3).^2 + c(3,3)*(X3 - 4*pi/3) + c(3,4);
plot(X3, Y3, ':')
```

```
legend({'f(x)', 'S_0(x)', 'S_1(x)', 'S_2(x)'})
title('Plot of function with cubic spline function')

hold off;
```



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