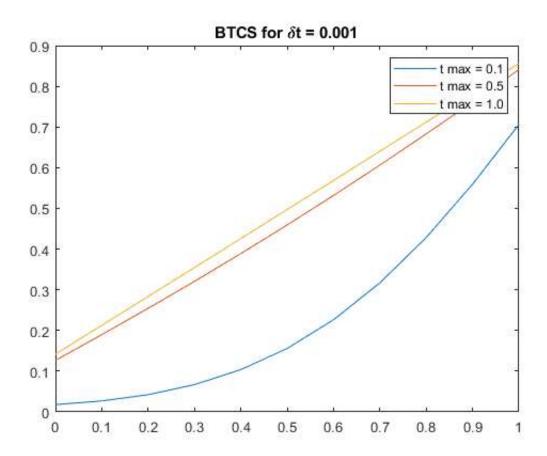
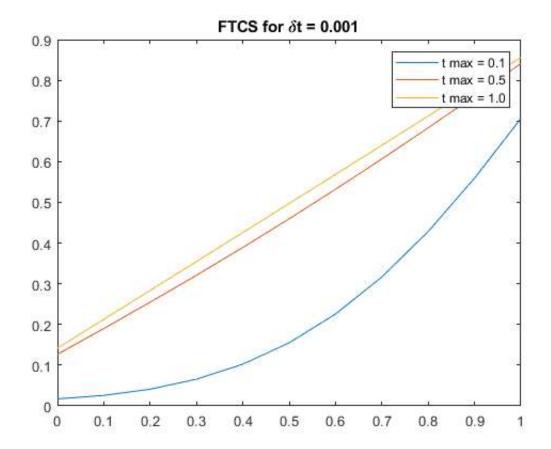
```
list = num2cell([0.1, 1, 1, 5, 5, 0, 1]);
[delta_x, Alpha, k, h0, hf, T0, Tf] = deal(list{:});
delta t = 0.001;
t \lim arr = [0.1, 0.5, 1.0];
N = 1/delta \times + 1;
Gamma = Alpha*delta_t/(delta_x^2);
a = [-k/delta x; -Gamma*ones(N-2, 1)];
b = [-Gamma*ones(N-2, 1); -k/delta x];
d = [k/delta x + h0; (2*Gamma+1)*ones(N-2, 1); k/delta x + hf];
r = [h0*T0; zeros(N-2, 1); hf*Tf];
t=delta t;
BTCS Soln = zeros(N, 1);
figure;
for i = 1:length(t lim arr)
       t_lim = t_lim_arr(i);
       while (t<=t lim)</pre>
               BTCS Soln = tridiag(a,b,d,r,N);
               r = [h0*T0; BTCS Soln(2:N-1); hf*Tf];
               t = t + delta t;
       plot(linspace(0,1,N), BTCS_Soln)
       hold on;
end
legend("t max = 0.1", "t max = 0.5", "t max = 1.0");
title("BTCS for \deltat = 0.001")
xlabel = "x 0 to 1";
ylabel = "Temperature";
t = delta t;
T init = zeros(N, 1);
FTCS Soln = zeros(N, 1);
figure;
for j = 1:length(t lim arr)
       t_lim = t_lim_arr(j);
       while(t<=t lim)</pre>
               for i = 2:N-1
                       FTCS Soln(i) = (1-2*Gamma)*T init(i) + Gamma*T init(i-1) + Gamma*T in
it(i+1);
               end
               FTCS Soln(1) = (FTCS Soln(2) *k/delta x + h0*T0)/(h0 + k/delta x);
               FTCS Soln(N) = (FTCS Soln(N-1)*k/delta x + hf*Tf)/(hf + k/delta x);
               T init = FTCS Soln;
               t = t+delta t;
       end
       plot(linspace(0,1,N), FTCS Soln)
       hold on;
legend("t max = 0.1", "t max = 0.5", "t max = 1.0");
```

```
title("FTCS for \deltat = 0.001")
xlabel = "x (0 to 1)";
ylabel = "Temperature";
```





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