

Intelligent Systems Assignment 1

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1 MatLab code

1.1 Changes to tsp.m

The decrease T by 0.1% was removed.

```
for jstep=1:ceil(maxsteps);  
%     temps = temps * 0.999;  
for ins = 1:100
```

1.2 plotmean.m

```
n = 250;  
maxsteps = 500;  
temp = [1, 0.5, 0.2, 0.1, 0.05, 0.02, 0.01, 0.005, 0.002, 0.001];  
method = 1;
```

```
meanresults = zeros(size(temp));  
standarddeviationresults = zeros(size(temp));
```

```
% Try the different temperatures
```

```
for index = 1:length(temp)  
    results = tsp(n, maxsteps, temp(index), method);  
    lastFifty = results(length(results) - 49:length(results));  
    meanresults(index) = mean(lastFifty);  
    standarddeviationresults(index) = sqrt(var(lastFifty));  
    fprintf('mean: %f \n', mean(lastFifty));  
    fprintf('variance: %f \n', var(lastFifty));  
end
```

```
% Plot the results in a graph
```

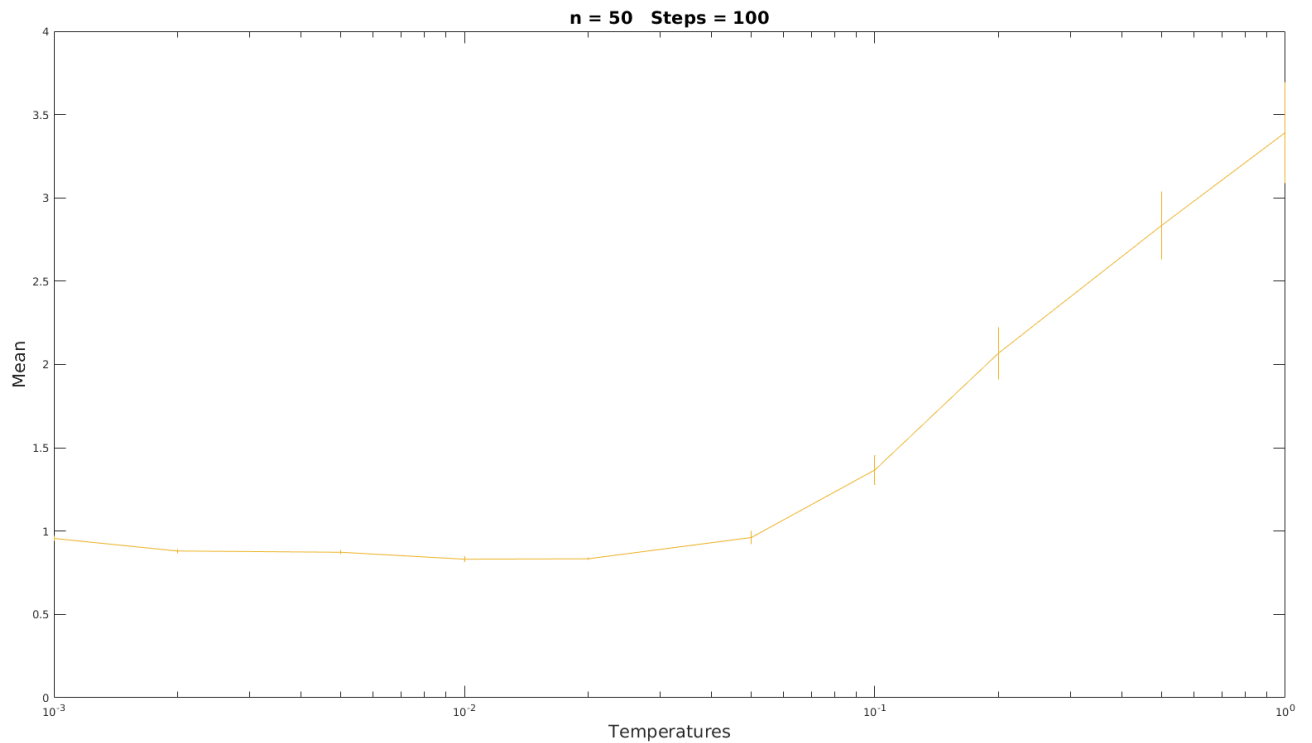
```
figure(3); semilogx(0,0); hold on;  
semilogx(temp, meanresults);  
errorbar(temp, meanresults, standarddeviationresults)  
title([ 'n = ', num2str(n, '%d'), ' ...  
      ' Steps = ', num2str(maxsteps, '%d') ], ...  
      'fontsize', 16);
```

```
xlabel(['Temperatures'], 'fontsize', 16);  
ylabel(['Mean'], 'fontsize', 16);
```

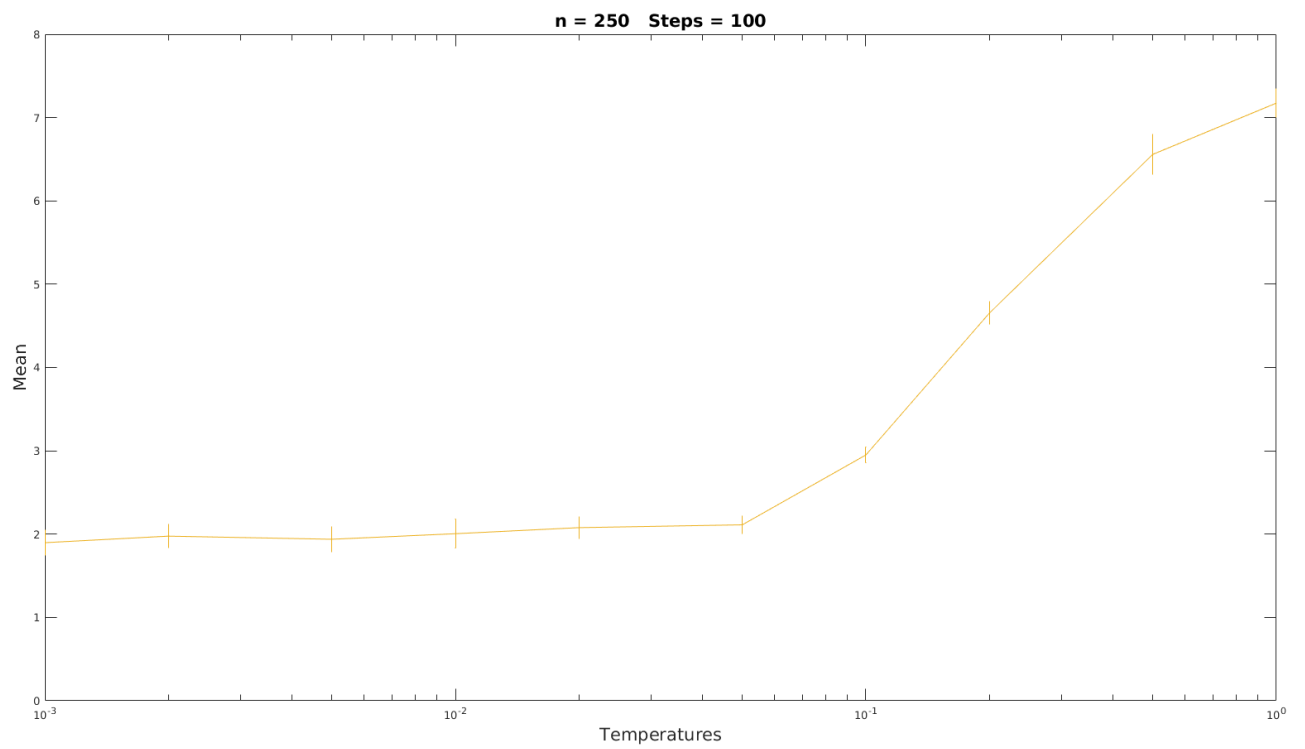
2 Plots

To show the impact of T, several T values have been used to run the tsp function. The tsp function returns the generated distance values. The last fifty of these values are used to plot the mean against the used T value.

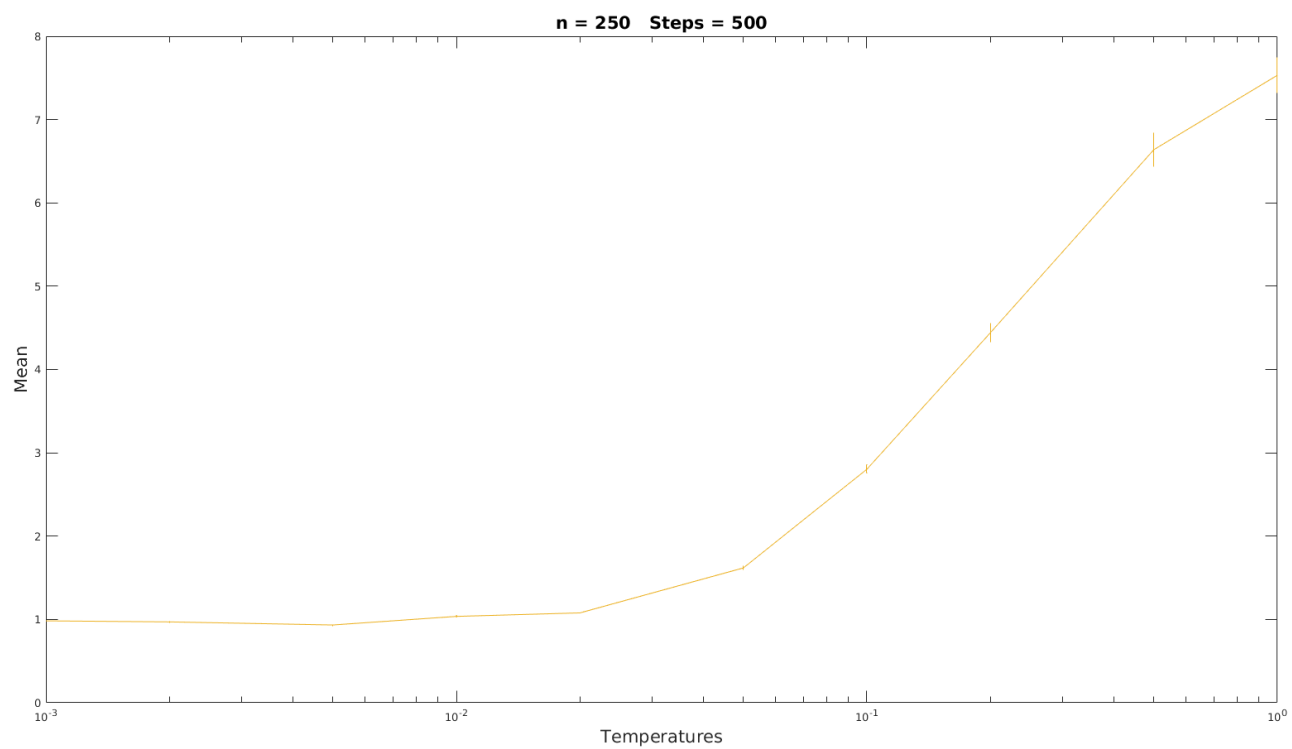
These plots show the value of T on the x-axis against the mean on the y-axis. The standard deviation is displayed around the data points.

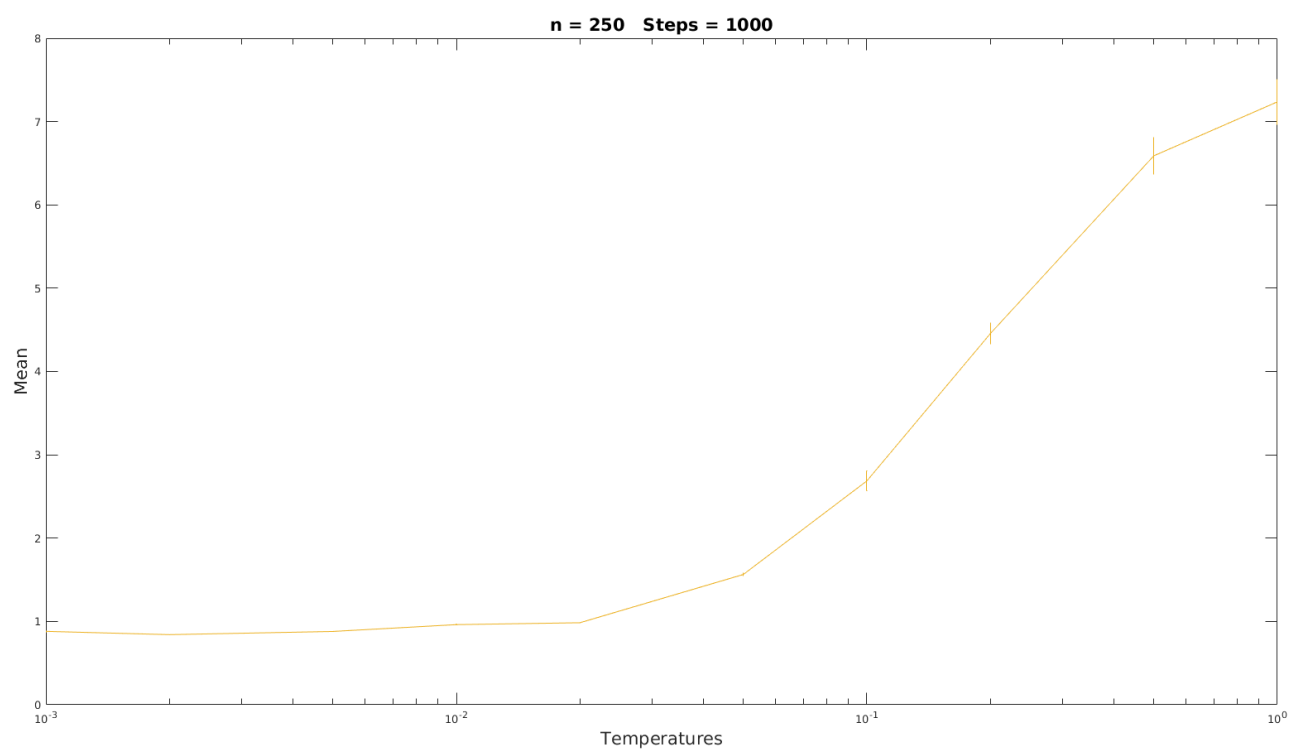


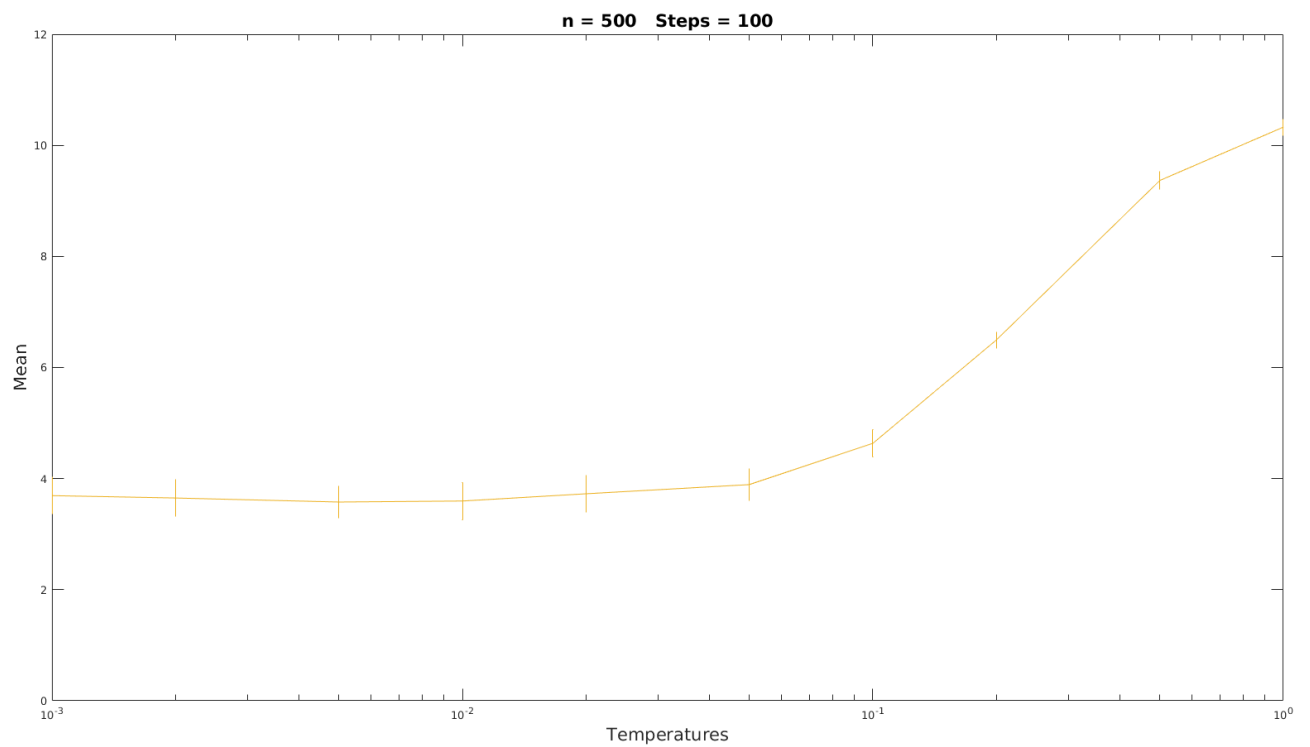
In this graph, the standard deviation is quite high with higher temperatures, and declines together with the mean.



Increasing the amount of cities from 50 to 250 also shows an increase of the mean (the y-axis has increased to 8 from 4 to accomodate for the mean) and the standard deviation.







3 T-Dependence

-Correlation of T and the resulting mean distance? -

4 Work done

The MatLab code was written by Sander and refactored by Wessel.