

Introduction to MATLAB

Friday, October 18

Exercises for individual work (2)

1. Write a function that returns as a result the minimum and the maximum value of a vector v , given as parameter.
2. Write a function that receives as parameter a matrix m , returns as a result two vectors $minval$, $maxval$, one containing the minimum values from each row of m , and the other one the maximum values from each row of m .
3. Write programs for drawing the Sierpinski triangle, the Koch curve, and the Snow Flake for different values of the iterations count n .
4. Calculate n scenarios at consecutive timestamps of the following process:

$$S(0) = S_init$$

$$S(t+dt) = S(t) + a*dt + b * N(0,1)$$
 $N(0,1)$ is in Matlab the *randn* function (normally distributed random variables)
 - Plot the values of each scenario for t time steps (all time steps $T=0:dt:dt*t$)
 - Calculate the average of scenarios and plot it (for each time step calculate the average value of n scenarios).
 - Calculate the scenario out of the lowest 5% of scenario values and plot it.

Hints:

- Use a matrix $S(j,t)$, where j is the scenario number and t is the time step number.
- Try to use $randn(n,1)$ instead of $randn$. (to save one Matlab for loop)
- $S_init = 1$; $a = 0.1$; $b=0.5$; $dt = 0.05$; $t= 20$, $n=200$;

Note:

For solving the exercises, you are encouraged to use your notes, the tutorial materials, and especially the MATLAB help. Some of the keywords useful for the exercises are: variable, expression, sequence, vector, plot, for, if, function.