MATLAB programming course for beginners, supported by Wagatsuma Lab@Kyutech

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Specifications and requirements

1. @Time : 2022-8-10
2. @Author : Hiroaki Wagatsuma
3. @Site : https://github.com/hirowgit/1A1_matlab_intermediate_course
4. @IDE : MATLAB R2022a
5. @File : lec2_step1.m

Main program

```
% a generator of the natural number sequence randomly aligned

tic
fdname={'allData200.mat','allData500.mat','allData1000.mat','allData10000.mat'};
load(fdname{1});

allData=allData(1:20,:);
```

```
NofD=size(allData,2);
setN=size(allData,1);


allData_s=sort(allData);

allData_d=diff(allData_s);

[ki kj]=find(allData_d>0);

sect_id=[0 find(diff(kj)>0)' length(kj)];
sect=[sect_id(1:end-1)+1; sect_id(2:end)];
sect_eg=mat2cell(sect',ones(1,NofD),2);

% sect_node=cellfun(@(x) kj(x(1):x(2)),sect_eg,'UniformOutput',false);
sect_data=cellfun(@(x) ki(x(1):x(2)),sect_eg,'UniformOutput',false);
NofE_data=cellfun(@(x) diff([0 x' setN])/
setN,sect_data,'UniformOutput',false);
NofE_data_m=cell2mat(NofE_data);

figure(1); clf;
imagesc(allData_s);

figure(2); clf;
% for k=1:NofD
%     plot(NofE_data{k},'.-'),hold on;
% end
plot(NofE_data_m','.-')
grid on;
xp=1:NofD;

set(gca,'ylim',[0 1],'ylim',[0 mean(mean(NofE_data_m))*3]);
str_lg=cellfun(@(x) ['id = ',num2str(x)],num2cell(xp),'UniformOutput',false);
legend(str_lg);
xticks(xp);

str_xtk=cellfun(@(x)
 ['Pr(x=',num2str(x),')'],num2cell(xp),'UniformOutput',false);
xticklabels(str_xtk);

figure(3); clf;
meanD = mean(NofE_data_m);
errD = std(NofE_data_m);
errorbar(xp,meanD,errD,'LineWidth',1.5,'MarkerSize',32);
set(gca,'xlim',[0.5 NofD+0.5],'ylim',[0 mean(meanD)*3]);
grid on;
xticks(xp);
xticklabels(str_xtk);

Error using cat
Dimensions of arrays being concatenated are not consistent.

Error in cell2mat (line 83)
```

```
            m{n} = cat(1,c{:,n});

Error in lec2_step1 (line 59)
NofE_data_m=cell2mat(NofE_data);
```

Supplementary information to publish

If you want to make a pdf or html file on the code, you can use the code "x_publish_each_codes.m" in the same folder. Please change the file name as " this_file_tag='lec*_step*' " (* will be replaced to the number of the target file).

The code "x_publish_all_codes.m" works for such a publication applying to all codes in the same folder (Note: "x_publish_all_codes_sub.m" should be located in the same folder).

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