---Step 1: Creating INP.File---

[ rawData,dat ] = creating\_inp\_file( '20x20x2.mph','mfnc.Bz',[10 13],'2mm\_mfnc.Bz.inp');

function [ rawData,dat ] = creating\_inp\_file( COMSOL\_file,Bz,sections,INP\_File)

%---Loading COMSOL\_file---

model=mphload(COMSOL\_file);

dat = mpheval(model,Bz,'edim','domain','selection',sections);

sumOfNodes=length(dat.p(1,:));

sumOfElements=length(dat.t(1,:));

%---Creating inp\_file---

% Number of Lines in the file

iLines=36+sumOfNodes+sumOfElements+ceil(sumOfNodes/9);

% Cellarray for the fileinput (preallocation)

rawData=cell(iLines,9);

% Writting inp\_file

rawData{1,1}='\*Heading';

rawData{2,1}='\*\*Job name: COMSOL\_file';

rawData{3,1}='\*\*Generated by: COMSOL Version 5.1';

rawData{4,1}='\*Preprint, echo=NO, model=NO, history=NO, contact=NO';

rawData{5,1}='\*Part, name=PART-1';

rawData{6,1}='\*Node';

for i=1:sumOfNodes

rawData{6+i,1}=i;%Node numbers

counter=1;

for j=2:4

rawData{6+i,j}=dat.p(counter,i);

counter=counter+1;

end

end

rawData{7+sumOfNodes,1}='\*Element, type=C3D4, elset=set1';

for i=1:sumOfElements

rawData{7+sumOfNodes+i,1}=i;

counter=1;

for j=2:5

rawData{7+sumOfNodes+i,j}=dat.t(counter,i)+1;

counter=counter+1;

end

end

rawData{8+sumOfNodes+sumOfElements,1}='\*Nset, nest=ALL';

counter=1;

for i=1:ceil(sumOfNodes/9)

for j=1:9

if counter == sumOfNodes+1

break

end

rawData{8+sumOfNodes+sumOfElements+i,j}=counter;

counter=counter+1;

end

end

rawData{9+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*SOLID SECTION, ELSET=set1, MATERIAL=PBM';

rawData{10+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}=1.0;

rawData{11+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*End Part';

rawData{12+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Assembly, name=Assembly';

rawData{13+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Instance, name=PART-1-2, part=PART-1';

rawData{14+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*End Instance';

rawData{15+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*End Assembly';

rawData{16+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Material, name=PBM';

rawData{17+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*\* ----------------------------------------------------------------';

rawData{18+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Step, name=Step-1';

rawData{19+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Static';

rawData{20+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='2., 2., 2e-05, 2.';

rawData{21+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Restart, write, frequency=0';

rawData{22+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Output, field, variable=PRESELECT';

rawData{23+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*Output, history, variable=PRESELECT';

rawData{24+sumOfNodes+sumOfElements+ceil(sumOfNodes/9)}='\*End Step';

% Printing inp\_file

iLines=length(rawData);

fileID = fopen(INP\_File,'w');

for i=1:iLines

if iscellstr(rawData(i))==1

formatSpec='%s\n';

fprintf(fileID,formatSpec,rawData{i});

else

for j=1:8

if isempty(rawData{i,j})==0 & isempty(rawData{i,j+1})==0

formatSpec='%d, ';

fprintf(fileID,formatSpec,rawData{i,j});

if j==8

formatSpec2='%d\n';

fprintf(fileID,formatSpec2,rawData{i,j+1});

end

else

formatSpec='%d\n';

fprintf(fileID,formatSpec,rawData{i,j});

break

end

end

end

end

fclose(fileID);