```matlab
function [] = readdata()   % read PHOENICS data

Error = 0;
NumberOfDimensions = 3;
NumOfHeaderLinesSectionOne = 2;
NumOfHeaderLinesSectionTwo = 11;
NumOfHeaderLinesSectionThree = 3;
NumOfPrimaryVariables = 10;
NumOfDataVariables = NumOfPrimaryVariables + NumberOfDimensions;
NumOfDataCollumns = 6;

fid = fopen('E:\Drive_G\Phoenics\D_PRIV1\NewSIMS\MOMENTUM
IMBALANCE\U0-8W0-2ke10000CNGR\S7000.txt','rt')

for i = 1:NumOfHeaderLinesSectionOne
    fgetl(fid);
end

logical_Xnum=fscanf(fid,'%d',1);
logical_Ynum=fscanf(fid,'%d',1);
logical_Znum=fscanf(fid,'%d',1);
%logical_Xnum
%logical_Ynum
%logical_Znum

for i = 1:NumOfHeaderLinesSectionTwo  %scrolls through the next 11 header lines.
    fgetl(fid);
end

Xcoord=ones(logical_Xnum,1);
Ycoord=ones(logical_Ynum,1);
Zcoord=ones(logical_Znum,1);
Z2coord=ones(logical_Znum,1);

for i = 1:logical_Xnum
    Xcoord(i)=fscanf(fid,'%f',1);
end

for i = 1:logical_Ynum
    Ycoord(i)=fscanf(fid,'%f',1);
end

for i = 1:logical_Znum
    Zcoord(i)=fscanf(fid,'%f',1);
end

for i = 1:logical_Znum
    Z2coord(i)=fscanf(fid,'%f',1);
end

for i = 1:NumOfHeaderLinesSectionThree
    fgetl(fid);
end

NumOfElementsInPlane = logical_Xnum*logical_Ynum;
NumOfDataFields = logical_Xnum*logical_Ynum*logical_Znum;
NumOfPlanes = logical_Znum;

list_variables = ones(NumOfDataFields,NumOfDataVariables);


for i = 1:NumOfPlanes
    for j = 1:NumOfPrimaryVariables    %9

        for k = 1:NumOfElementsInPlane    %35

            NumArrayElement = (i-1)*NumOfElementsInPlane+(k-1)+1;
            RawData = fscanf(fid,'%f',1);
```

```matlab
        list_variables(NumArrayElement,(j+3)) = RawData;

      end

    end

end


for i = 1:logical_Znum

    for j = 1:logical_Xnum

      for k = 1:logical_Ynum

          NumArrayElement =
(i-1)*NumOfElementsInPlane+(j-1)*logical_Ynum+(k-1)+1;
          list_variables(NumArrayElement,1)=Xcoord(j);
          list_variables(NumArrayElement,2)=Ycoord(k);
          list_variables(NumArrayElement,3)=Zcoord(i);

      end

    end

end

list_variables;

%%%%%%%%%%%%%%%%%%%%
%%%POSTPROCESSING%%%
%%%%%%%%%%%%%%%%%%%%%%

ColumnArray=ones(logical_Znum*NumOfDataCollumns,NumOfDataVariables);  %creating
the array so that it can be print on the screen.

X1point = 1.277716;
Y1point = 2.768333;
N = 1;

for i = 1:NumOfDataFields
    if (list_variables(i,1) == X1point) & (list_variables(i,2) == Y1point) %if
there is an x=2.5 and a y= 2.75 in list_variables(i,1) and (i,2), i.e. in Xcoord
and Ycoord fields.
        ColumnArray(N,:) = list_variables(i,:);
        N = N+1;
    end
end

X2point = 2.593484;
Y1point = 2.768333;

for i = 1:NumOfDataFields
    if (list_variables(i,1) == X2point) & (list_variables(i,2) == Y1point)
        ColumnArray(N,:) = list_variables(i,:);
        N = N+1;
    end
end

X3point = 3.811276;
Y1point = 2.768333;

for i = 1:NumOfDataFields
    if (list_variables(i,1) == X3point) & (list_variables(i,2) == Y1point)
        ColumnArray(N,:) = list_variables(i,:);
        N = N+1;
    end
end
```

```
dlmwrite('E:\Drive_G\Phoenics\D_PRIV1\NewSIMS\MOMENTUM
IMBALANCE\U0-8W0-2ke10000CNGR\S7000.xls',ColumnArray,'\t')
```