```
% Assignment 5 Q3
clear

% The provided data is loaded into the script via this command. Please make
% sure it is present with right name in the directory while running this script.

load('problem_set_05_data.mat')

volfrac = 0.3; nel = 20;

l1 = 0; l2 = 100000; move = 0.25;
while (l2-l1 > 1e-4)
lmid = 0.5*(l2+l1);
density_new = max(0.001,max(density-move,min(1.,min(density+move,density.*(-sensitivity./lmid).^0.75))));
if sum(sum(density_new)) - volfrac*nel > 0
l1 = lmid;
else
l2 = lmid;
end
end

final_matrix  = zeros(20,4);

final_matrix(:,1) = density;
final_matrix(:,2) = sensitivity;
final_matrix(:,3) = density_new;
final_matrix(:,4) = density_new - density;

disp('The Final Matrix:')

final_matrix
```

```
The Final Matrix:

final_matrix =

    0.1450  -46.9391    0.1590    0.0141
    0.3557   -1.1902    0.1057   -0.2500
    0.2732  -33.7123    0.2339   -0.0394
    0.2030  -16.2182    0.1004   -0.1026
    0.4797  -79.4285    0.7297    0.2500
    0.3379  -31.1215    0.2724   -0.0655
    0.3174  -52.8533    0.3806    0.0632
    0.5295  -16.5649    0.2795   -0.2500
    0.1650  -60.1982    0.2182    0.0532
    0.4372  -26.2971    0.3106   -0.1266
    0.4352  -65.4079    0.6123    0.1771
    0.2196  -68.9215    0.3214    0.1018
    0.3278  -74.8152    0.5102    0.1824
    0.0438  -45.0542    0.0466    0.0028
    0.0311   -8.3821    0.0094   -0.0218
    0.3064  -22.8977    0.1962   -0.1102
    0.4498  -91.3337    0.6998    0.2500
    0.5392  -15.2378    0.2892   -0.2500
    0.0750  -82.5817    0.1257    0.0507
    0.3284  -53.8342    0.3993    0.0709
```

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