Assignment 5

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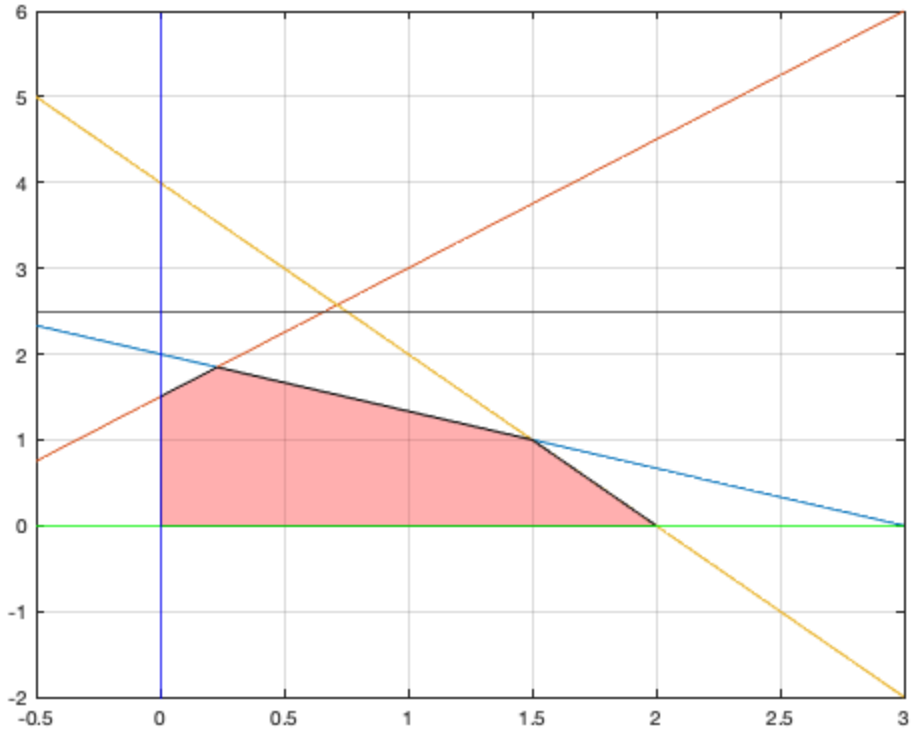
Exercise 2

```
clc
clear

x = linspace(-0.5, 3);
x1 = (6-2*x)/3;
x2 = (3+3*x)/2;
x3 = (4-2*x);

X = [0 0   0.2308 1.5 2];
Y = [0 1.5 1.8462 1   0];
figure
plot(x, x1, x, x2, x, x3)
yline(0,'g');
yline(2.5);
xline(0,'b');
hold on
patch(X, Y, 'r','FaceAlpha',.3)
hold off
grid
```



Exercise 3

```
%Init
G = [6, 2, 1;
     2, 5, 2;
     1, 2, 4];
c = [-8;-3;-3];
A = [1, 0, 1;
     0, 1, 1];
b = [3; 0];
x = [0; 0; 0];
lambda = [0;0];
tol = 10^-5;

for k = 1:50
    x_k = G\(c - A' * lambda)
    lambda = lambda + (A * x_k - b)
    if norm(x_k - x) <= tol
        break;
    end
    x = x_k;
end


x_k =
```

```
   -1.2892
    0.1084
   -0.4819


lambda =

   -4.7711
   -0.3735


x_k =

   -0.4584
   -0.7528
    1.0271


lambda =

   -7.2024
   -0.0991


x_k =

    0.0041
   -1.2644
    1.7066


lambda =

   -8.4917
    0.3430


x_k =

    0.2744
   -1.5822
    2.0097


lambda =

   -9.2076
    0.7704


x_k =

    0.4398
   -1.7872
```

```
    2.1429


lambda =

   -9.6248
    1.1262


x_k =

    0.5452
   -1.9233
    2.2000


lambda =

   -9.8795
    1.4028


x_k =

    0.6146
   -2.0158
    2.2234


lambda =

  -10.0415
    1.6105


x_k =

    0.6614
   -2.0795
    2.2322


lambda =

  -10.1479
    1.7631


x_k =

    0.6935
   -2.1239
    2.2348
```

```
lambda =

  -10.2196
    1.8740


x_k =

    0.7158
   -2.1551
    2.2350


lambda =

  -10.2688
    1.9539


x_k =

    0.7314
   -2.1771
    2.2344


lambda =

  -10.3029
    2.0112


x_k =

    0.7424
   -2.1927
    2.2337


lambda =

  -10.3268
    2.0522


x_k =

    0.7502
   -2.2037
    2.2330


lambda =
```

```
  -10.3437
    2.0814


x_k =

    0.7557
   -2.2115
    2.2324


lambda =

  -10.3555
    2.1023


x_k =

    0.7596
   -2.2171
    2.2320


lambda =

  -10.3640
    2.1172


x_k =

    0.7624
   -2.2210
    2.2316


lambda =

  -10.3699
    2.1277


x_k =

    0.7644
   -2.2238
    2.2314


lambda =

  -10.3742
```

```
    2.1353


x_k =

    0.7658
   -2.2258
    2.2312


lambda =

  -10.3772
    2.1406


x_k =

    0.7668
   -2.2273
    2.2311


lambda =

  -10.3793
    2.1444


x_k =

    0.7675
   -2.2283
    2.2310


lambda =

  -10.3809
    2.1472


x_k =

    0.7680
   -2.2290
    2.2309


lambda =

  -10.3819
    2.1491
```

```
x_k =

    0.7683
   -2.2295
    2.2309


lambda =

  -10.3827
    2.1505


x_k =

    0.7686
   -2.2299
    2.2308


lambda =

  -10.3833
    2.1514


x_k =

    0.7688
   -2.2301
    2.2308


lambda =

  -10.3837
    2.1521


x_k =

    0.7689
   -2.2303
    2.2308


lambda =

  -10.3839
    2.1526


x_k =
```

```
    0.7690
   -2.2304
    2.2308


lambda =

  -10.3841
    2.1530


x_k =

    0.7691
   -2.2305
    2.2308


lambda =

  -10.3843
    2.1532


x_k =

    0.7691
   -2.2306
    2.2308


lambda =

  -10.3844
    2.1534


x_k =

    0.7691
   -2.2307
    2.2308


lambda =

  -10.3844
    2.1535


x_k =

    0.7692
```

```
   -2.2307
    2.2308


lambda =

  -10.3845
    2.1536


x_k =

    0.7692
   -2.2307
    2.2308


lambda =

  -10.3845
    2.1537


x_k =

    0.7692
   -2.2307
    2.2308


lambda =

  -10.3846
    2.1537


x_k =

    0.7692
   -2.2307
    2.2308


lambda =

  -10.3846
    2.1538


x_k =

    0.7692
   -2.2307
    2.2308
```

```
lambda =

  -10.3846
    2.1538


x_k =

    0.7692
   -2.2308
    2.2308


lambda =

  -10.3846
    2.1538
```

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