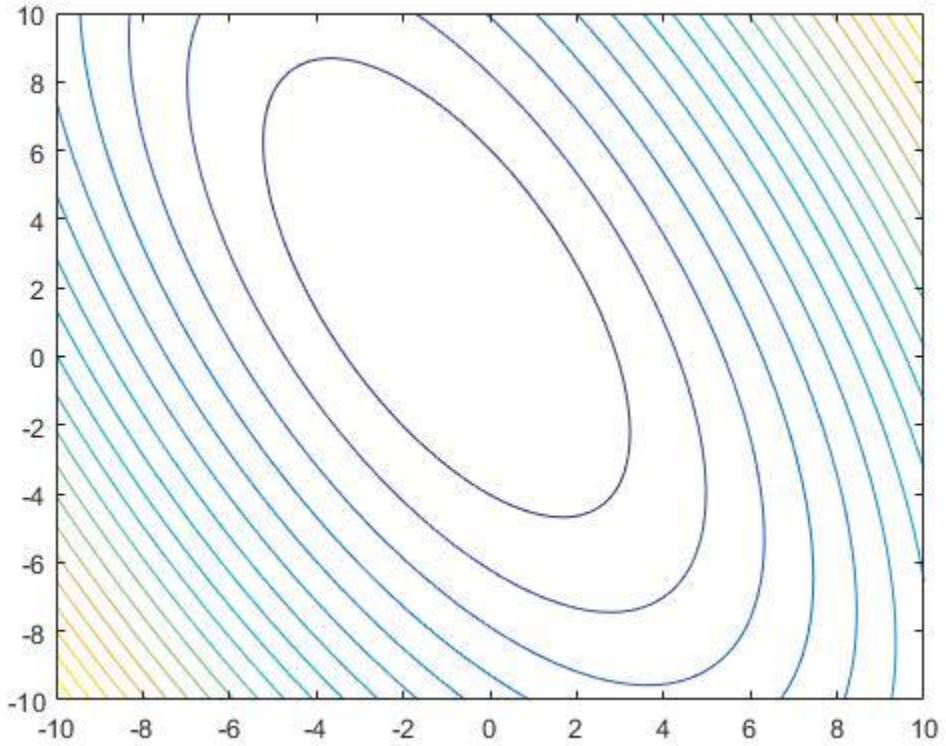
DISCUSSION 4: QP VISULIZATION

Unconstrained QP

We want to minimize: $J(x_1, x_2) = 5x_1^2 + 4x_1x_2 + 2x_2^2 + 2x_1 - 4x_2.$

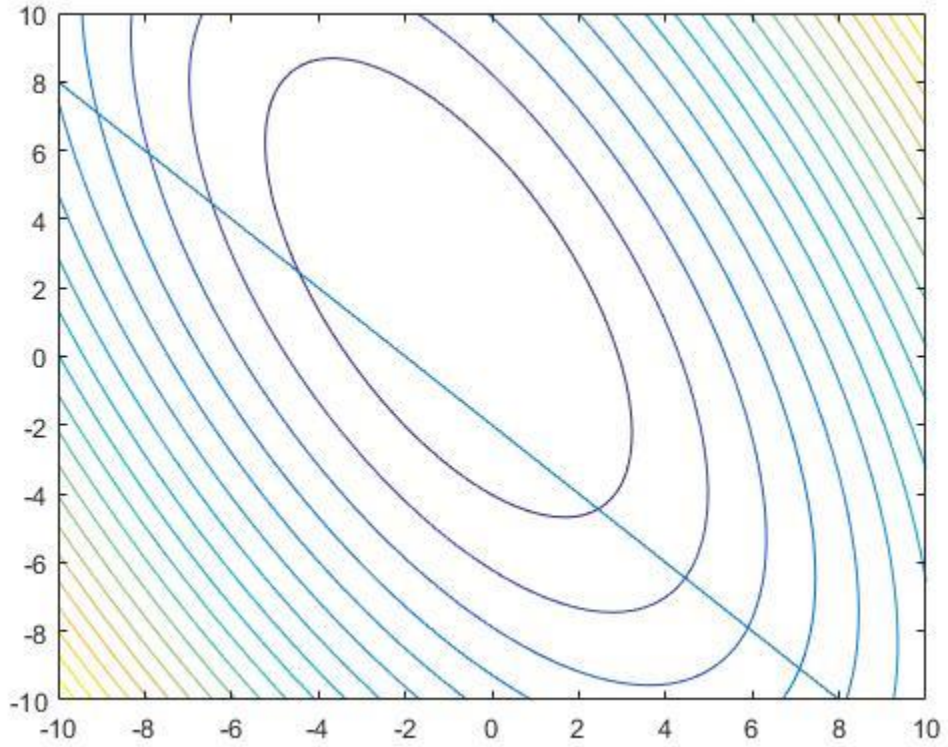



```
A = [5 2;2 2];
b = [2 -4];
cvx_begin
    variable x(2)
    minimize quad_form(x,A)+b*x
cvx_end
```

$x = [-1; 2].$

Linear equality constraint

We add a linear equality constraint:$x_1 + x_2 + 2 = 0$.

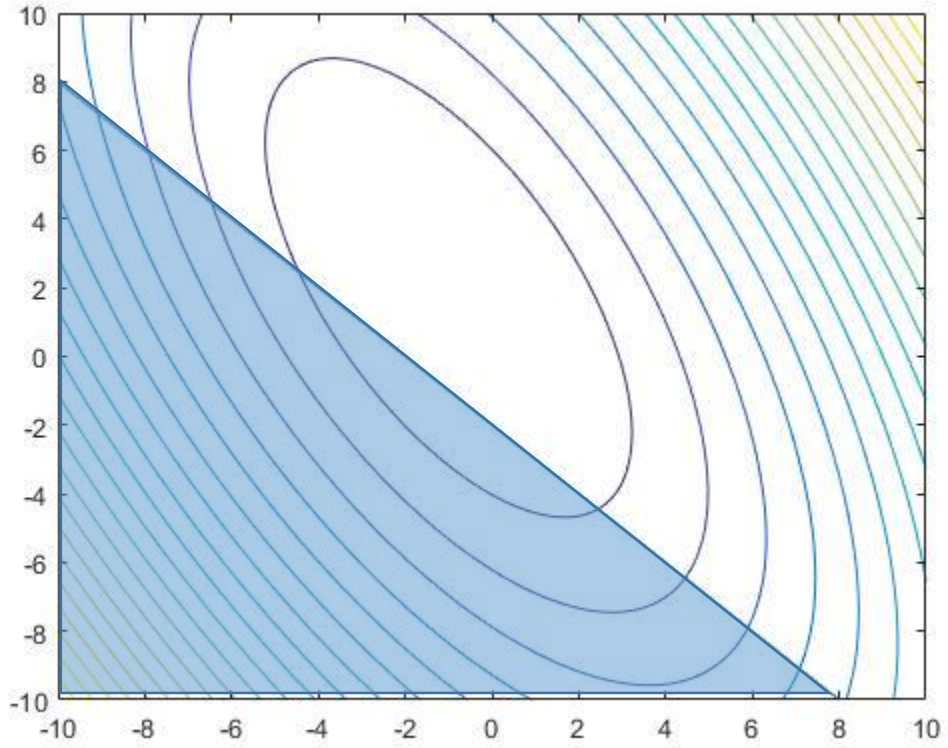



```
A = [5 2;2 2];
b = [2 -4];
cvx_begin
    variable x(2)
    minimize quad_form(x,A)+b*x
    subject to
        x1+x2+2 == 0;
cvx_end
```

$x = [-1; -1]$.

Linear inequality constraint

We add a linear inequality constraint:$x_1 + x_2 + 2 \leq 0$.



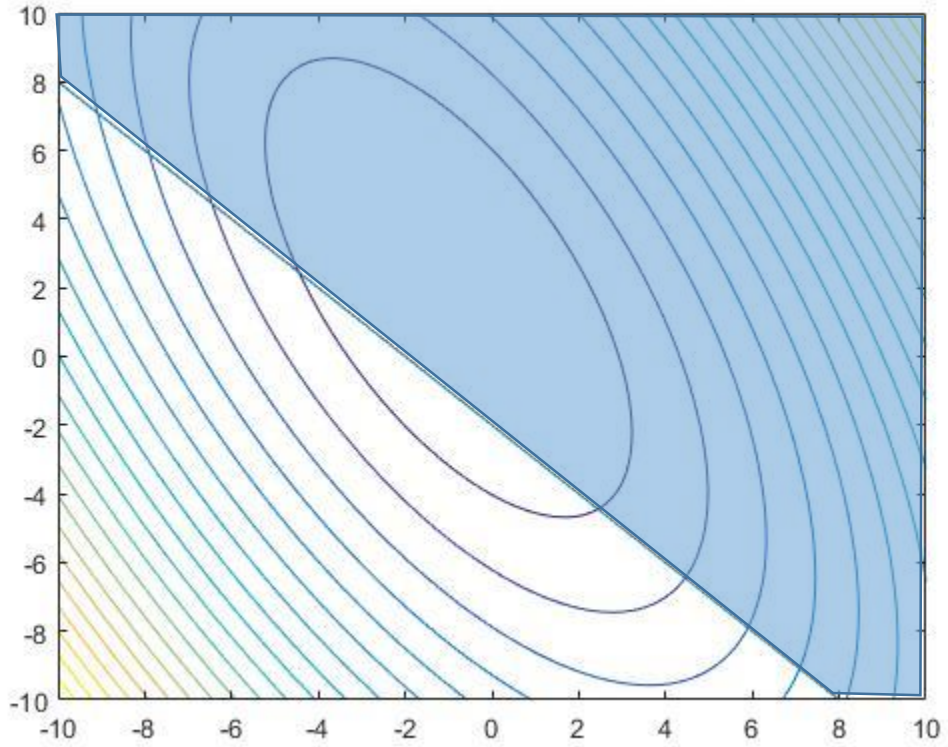

```
A = [5 2;2 2];
b = [2 -4];
cvx_begin
    variable x(2)
    minimize quad_form(x,A)+b*x
    subject to
        x1+x2+2 <= 0;
cvx_end
```

$x = [-1; -1]$.

UCLA LORIS

Linear inequality constraint

We add a linear inequality constraint:$x_1 + x_2 + 2 \geq 0$.




```
A = [5 2;2 2];
b = [2 -4];
cvx_begin
    variable x(2)
    minimize quad_form(x,A)+b*x
    subject to
        x1+x2+2 >= 0;
cvx_end
```

$x = [-1; 2]$.