

# Lab Journal Isak Skeie

## Matrix definitions

From the equations given in the problem description, the matrices  $H$ ,  $c$ ,  $A$ ,  $b$   $x_L$  and  $x_H$  are found. These matrices are derived from the objective function and constraints given in the problem. The solver can then be used to find the best values for the three parameters to minimize the cost function.

This is done in LabView, by making a function block for the matrix declarations, the output pins are then connected to the SQOASES block.

By connecting the output to a scope, the values for the parameters are plotted and shown to be -0.67, 0.78 and 1 respectively with a simulation time and stop time of 0.1.

```
function [H, c, A, xL, xH, b] = QR_Problem()

%Make matrices and vectors

%Hessian matrix H
H_mat = diag([6,0,-10]);

    %Need to stack elements in matrix column wise for solver
    H = H_mat(:);

%C Matrix
%Linear Term vector
c = [2.5 7 0]';

%A matrix
%Equality constraints

A_mat = [2 3 4;
        -3 0 -8;
        -4 -3.2 1.8];
A = A_mat(:);

%RHX of equality constraints
b = [5 -6 2]';
```

```
%Bounds
xL = [-inf -inf -inf]';
xH = [inf inf inf]';
```

