

```
A = [-1 0 -1; -1 -1 0; 0 -1 -1]
```

```
A = 3x3
    -1     0    -1
    -1    -1     0
     0    -1    -1
```

```
B = [1; 0; 0]
```

```
B = 3x1
     1
     0
     0
```

```
C = [0 0 1]
```

```
C = 1x3
     0     0     1
```

```
D = [0]
```

```
D = 0
```

```
sys = ss(A, B, C, D)
```

```
sys =
```

```
A =
      x1  x2  x3
x1  -1   0  -1
x2  -1  -1   0
x3   0  -1  -1
```

```
B =
      u1
x1   1
x2   0
x3   0
```

```
C =
      x1  x2  x3
y1   0   0   1
```

```
D =
      u1
y1   0
```

Continuous-time state-space model.

```
R = 10
```

```
R = 10
```

```
Q = [4 0 0; 0 4 0; 0 0 0]
```

```
Q = 3x3
     4     0     0
     0     4     0
     0     0     0
```

```
[K, S, e] = lqr(sys, Q, R, 0)
```

```
K = 1x3
    0.2293   -0.0556   -0.0941
S = 3x3
    2.2933   -0.5563   -0.9407
   -0.5563    2.1808   -0.1962
   -0.9407   -0.1962    0.8964
e = 3x1 complex
   -0.5998 + 0.8483i
   -0.5998 - 0.8483i
   -2.0297 + 0.0000i
```

```
sys_opt = ss(A - B * K, B, C - D * K, D)
```

```
sys_opt =
```

```
A =
      x1      x2      x3
x1  -1.229  0.05563  -0.9059
x2     -1     -1      0
x3      0     -1     -1
```

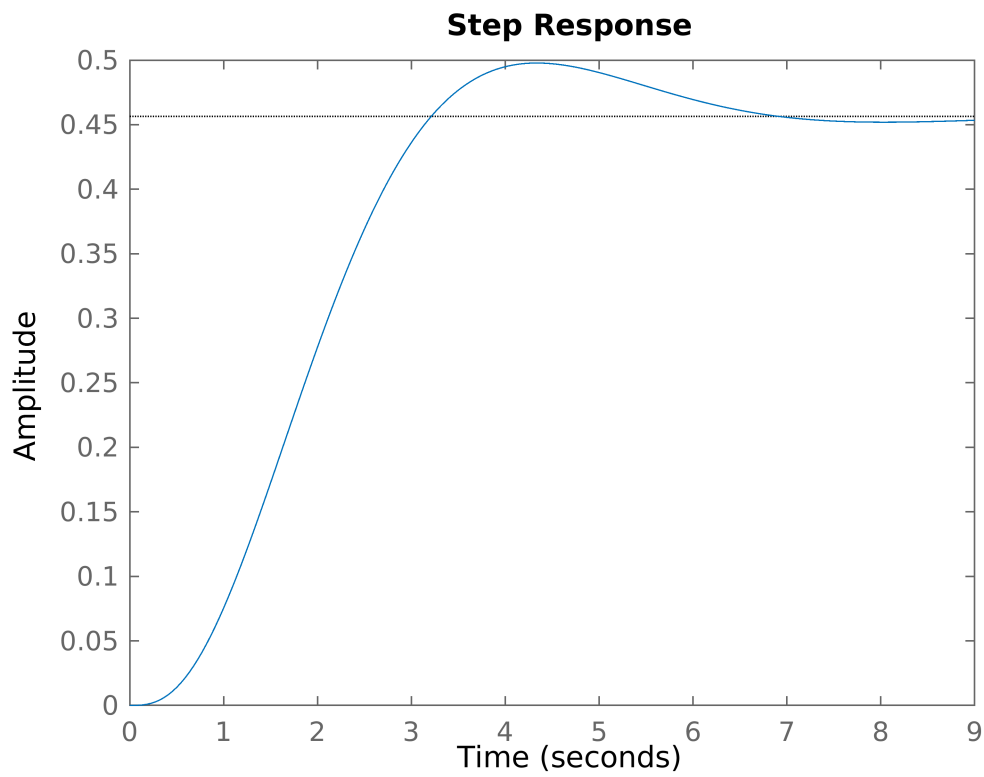
```
B =
      u1
x1    1
x2    0
x3    0
```

```
C =
      x1  x2  x3
y1    0   0   1
```

```
D =
      u1
y1    0
```

Continuous-time state-space model.

```
step(sys_opt)
```



```
stepinfo(sys_opt)
```

```
ans = struct with fields:  
    RiseTime: 1.9566  
    TransientTime: 6.1115  
    SettlingTime: 6.1115  
    SettlingMin: 0.3964  
    SettlingMax: 0.4776  
    Overshoot: 8.9087  
    Undershoot: 0  
    Peak: 0.4776  
    PeakTime: 4.2558
```