```
yd = D['price'] # vector of outcomes
N = len(yd)
X = np.vstack((D['area'], D['beds']))
X.shape
```

Out[ ]:
```
(2, 774)
```

In [ ]:
```
ydhat = beta @ X + v; # vector of predicted outcomes
rd = yd - ydhat; # vector of predicted errors
np.sqrt(sum(rd**2)/len(rd)) # RMS prediction error
```

Out[ ]:
```
74.84571862623025
```

In [ ]:
```
# Compare with standard deviation of prices
np.std(yd)
```

Out[ ]:
```
112.78216159756509
```

8.3. Systems of linear equations

Balancing chemical reactions. We verify the linear balancing equation on page 155 of VMLS, for the simple example of electrolysis of water.

In [ ]:
```
R = np.array([2,1])
P = np.array([[2,0], [0,2]])
#Check balancing coefficients [2,2,1]
coeff = np.array([2,2,1])
coeff @ np.vstack((R, -P))
```

Out[ ]:
```
array([0, 0])
```