PCA - An example on Exploratory Data Analysis

In this notebook you will:

- Replicate Andrew's example on PCA
- Visualize how PCA works on a 2-dimensional small dataset and that not every projection is "good"
- Visualize how a 3-dimensional data can also be contained in a 2-dimensional subspace
- Use PCA to find hidden patterns in a high-dimensional dataset

Importing the libraries

In [1]:
```
import pandas as pd
import numpy as np
from sklearn.decomposition import PCA
from pca_utils import plot_widget
from bokeh.io import show, output_notebook
from bokeh.plotting import figure
import matplotlib.pyplot as plt
import plotly.offline as py
```

In [2]:
```
py.init_notebook_mode()
```

In [3]:
```
output_notebook()
```

(https://bokeh.org)BokehJS 2.4.3 successfully loaded.

Lecture Example

We are going work on the same example that Andrew has shown in the lecture.

In [4]:
```
X = np.array([[ 99,  -1],
       [ 98,  -1],
       [ 97,  -2],
       [101,   1],
       [102,   1],
       [103,   2]])
```

In [5]:
```
plt.plot(X[:,0], X[:,1], 'ro')
```

Out[5]:
```
[<matplotlib.lines.Line2D at 0x7f887c449a90>]
```