Assignment 5 - (25 points)

Your assignment for Monday, October 20th, is to estimate the 3d position of a target by filtering a sequence of 1d and 2d sensor observations (from the text file `A5-MeasurementData.txt`). Each observation (**z**, **R**, **H**) will be provided in the following format:

- An integer giving the dimensionality of the observation (1 or 2).
- The observation mean (floats).
- The row-order upper-triangular elements of the observation covariance (floats).
- The transformation **H** in row order (floats).

Your report will include the following:

- A single plot of all of the normalized innovations. (Note that some observations will provide one innovation and others will generate two.)
- A single plot of the same number of values as above, except generated by `randn`, for comparison purposes. (If your filter is working correctly the two should look similar.)
- Your final estimated 3d mean and covariance.
- An appendix containing your code.

Your fusion operations should be performed by an implementation of the following function:

```
[x P v] = update(x, P, z, R, H);
```

where the returned values are the updated system estimate, (**x**, **P**), and the vector ***v*** of the normalized innovations obtained from processing the observation (**z**, **R**, **H**). Your observations will be obtained using an implementation of the following function:

```
[z R H] = getObservation(fp);
```

where fp is the file pointer. Your filtering loop should therefore look something like the following:

```
initialize estimate (x,P)
while not end-of file
    [z R H] = getObservation(fp);
    [x P v] = update(x, P, z, R, H);
    :
end while
```

As usual, your PDF report must be emailed before the beginning of class on the due date.