Ph 21.1 - Strings and Webs

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1 Low-level approach

The CTRS dataset for a radius of 0.1 arcmin around Her X-1 was accessed and parsed using the following python script:

```
import requests as req
import re
import string
import matplotlib.pyplot as plt

url = 'http://nesssi.cacr.caltech.edu/cgi-bin/getcssconedbid_release2.cgi'
form = {'Name': 'Her X-1', 'Rad': 0.1, 'DB': 'photcat', 'OUT': 'web', 'SHORT': 'short'}

r = req.post(url, data=form)
# print(r.text)
data = r.text.splitlines()
# print(data)


time = []
mag = []
mag_err = []

for i in data:
    if re.match('^<tr>', i):
        entry = i.strip().split('<td>')
        mag.append(float(entry[2].strip("'")))
        mag_err.append(float(entry[3].strip("'")))
        time.append(float(entry[6].rstrip('</tr>').strip("'")))


plt.figure()
plt.xlabel('Time (MJD)')
plt.ylabel('Magnitude')
plt.errorbar(time, mag, yerr=mag_err, fmt='o', mfc='black', ms=2, mec='black', ecolor='red', capsize=
plt.savefig('Plot_1_1.png')
```

The dataset obtained was then plotted using *matplotlib* from the *pyplot* library and the folloring plot was obtained:

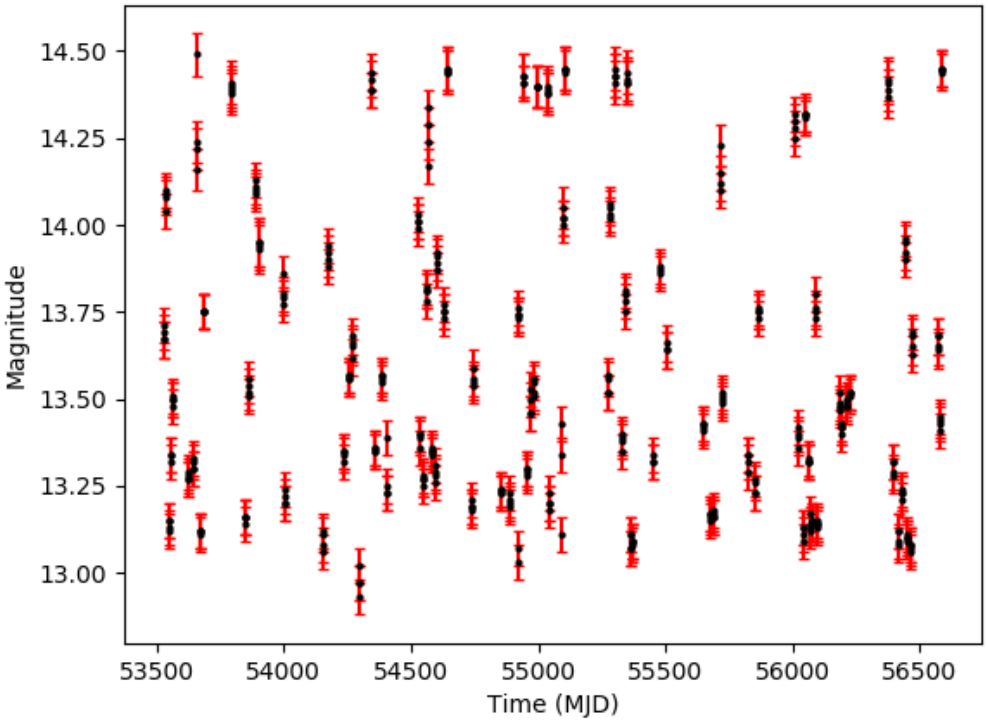

Figure 1: Plot of Magnitude against time for Her X-1

2 High-level approach

The same dataset as above was downloaded from the CTRS website and parsed using *io.votable* from the *astropy* library:

```
import matplotlib.pyplot as plt
from astropy.io.votable import parse_single_table as parse1

votable = parse1("result_web_fileT5Mkdp.vot", pedantic=False)


mag = votable.array['Mag']
mag_err = votable.array['Magerr']
time = votable.array['ObsTime']


plt.figure()
plt.xlabel('Time (MJD)')
plt.ylabel('Magnitude')
plt.errorbar(time, mag, yerr=mag_err, fmt='o', mfc='black', ms=2, mec='black', ecolor='red', capsize=
plt.savefig('Plot_1_2.png')
```

The dataset obtained was again plotted as before using *matplotlib*:

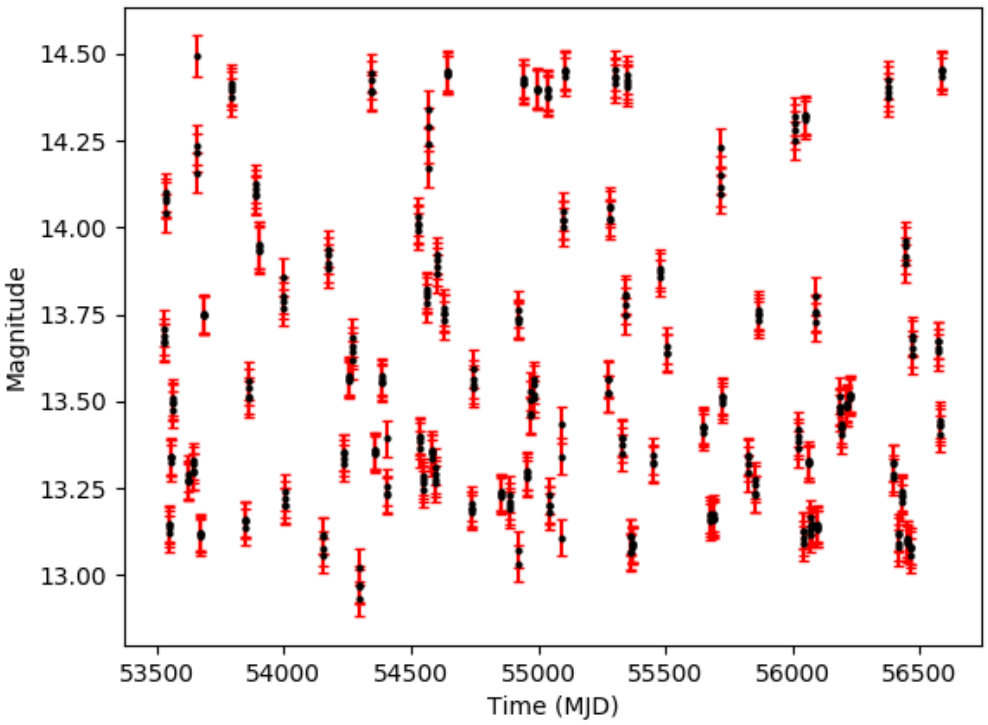

Figure 2: Plot of Magnitude against time for Her X-1