Stoner Cheat Sheet

Loading a data file

```
>>>import Stoner
>>>d=Stoner.DataFile('my_data.txt')
>>>d=Stoner.VSMFile('my_VSM_data.fld')
```

Valid file types: DataFile, VSMFile, BigBlueFile, CSVFile, XRDFile, SPCFile, BNLFile, TDMSFile, QDSquidVSMFile, OpenGDAFile, RasorFile, FmokeFile

Looking at data

As a whole:

```
>>>d.data
>>>d.column_headers
>>>d.metadata
```

Columns:

```
>>>d.column(0)
>>>d.column('Temperature')
>>>d.column(['Temperature',0])
>>>d.Temperature
```

Rows:

```
>>>d[1]
>>>d[1:4]
```

Specific:

```
>>>d[10,0]
>>>d[10,'Temp']
>>>d[0:10,['Voltage','Temp']
```

Getting the index of a column:

```
>>> index=d.find_col(1)
>>> index=d.find_col('Temperature')
>>> index=d.find_col('Temp.*')
>>> index=d.find_col(['Temperature',2,'Resistance'])
```

Getting an iterable of the column/row:

```
>>> d.rows()
>>> d.columns()
>>> for row in d:
```

Searching:

```
>>>d.search('Temperature',4.2)
>>>d.search('Temperature',4.2,['Temperature',
                                'Resistance'])
>>>d.search('Temperature',lambda x,y: x>10 and x<100)
>>>d.search('Temperature',lambda x,y: x>10 and
          x<1000 and y[1]<1000,['Temperature',
                                'Resistance'])
>>> d.unique('Temp')
>>> d.unique(column,return_index=False,
                            return_inverse=False)
```

Copying:

```
>>> t=d.clone
```

Modifying data

Appending data

```
>>>a=Stoner.DataFile('some_new_data.txt')
>>>add_rows=d+a
>>>add_columns=d&a
>>>d.add_column(numpy.array(range(100)),
                            'Column Header')
>>>d.add_column(numpy.array(range(100)),
                     'Column Header',Index)
>>>d.add_column(lambda x: x[0]-x[1],
                'Column Header',func_args=None)
```

(here + is add rows and & is add columns)

Swap, reorder and rename columns:

```
>>> d.swap_column(('Resistance','Temperature'))
>>> d.swap_column(('Resistance','Temperature'),
                                 headers_too=False)
>>> d.swap_column([(0,1),('Temp','Volt'),(2,'Curr')])
>>> d.reorder([1,3,'Volt','Temp'])
>>> d.reorder([1,3,'Volt','Temp'],header_too=False)
>>> d.rename('old_name','new_name')
>>> d.rename(0,'new_name')
```

Sort columns ascending:

```
>>>d.sort('Temp')
>>>d.sort(['Temp','Gate'])
```

Delete rows and columns:

```
>>>d.del_rows(10)
>>>d.del_rows('X Col',value)
>>>d.del_rows('X Col',lambda x,y:x>300)
>>>d.del_column('Temperature')
>>>d.del_column(1)
```

Saving data

Data saved in TDI format (tab delimited with first column reserved for metadata), or CSV formatted with no metadata.

```
>>>d.save()   #saves with the filename
             #that it was loaded with
>>>d.save(filename)
  >>>d=Stoner.CSVFile(d)
>>>d.save()
>>>d.save(filename,'\t')
```

Plotting data

2D:

```
>>> import Stoner.Plot as plot
>>> p.plot_xy(column_x, column_y)
>>> p.plot_xy(column_x, [y1,y2])
>>> p.plot_xy(x,y,'ro')
>>> p.plot_xy(x,[y1,y2],['ro','b-'])
>>> p.plot_xy(x,y,title='My Plot')
>>> p.plot_xy(x,y,figure=2)
>>> p.plot_xy(x,y,plotter=pyplot.semilogy)
>>> p.plot_xy(x,y,plotter=errorbar,
            yerr='dResistance', xerr=[5,'dTemp+'])
```

3D:

```
>>> p.plot_xyz(col_x,col_y,col_z)
>>> p.plot_xyz(col_x,col_y,col_z,
                    cmap=matplotlib.cm.jet)
>>> p.plot)xyz(col-x,col-y,col-z,
                    plotter=pyplot.pcolor)
```

Analysing data

Load the data:

```
>>> import Stoner.Analysis as Analysis
>>> a=Analysis.AnalyseFile('Data')
>>>  a2=Analysis.AnalyseFile()
>>> a2=d
>>> a3=Analysis.AnalyseFile(d)
```

Do maths on the data:

```
>>> a.subtract('A','B'm header="A-B",replace=True)
>>> a.subtract(0,1)
>>> a.subtract(0,3.141592654)
>>> a.subtract(0,a2.column(0))
>>> a.add('A','B',header='A plus B',replace=False)
>>> a.normalise('data','reference',
            header='Normalised Data',replace=True)
```

Fit the data:

```
>>> a.polyfit(column_x,column_y,polynomial_order,
      bounds=lambda x, y:True, result="New Column")
>>> a.curve_fit(func,  xcol, ycol, p0=None, sigma=None,
      bounds=lambda x, y: True, result="New column" )
```