

In [5]:

```
import pandas as pd
import os
from enum import Enum
import numpy as np
import scipy
from numpy import sqrt, sin, cos, tan, pi
from scipy.integrate import odeint
from scipy.interpolate import InterpolatedUnivariateSpline
import matplotlib as mpl
import matplotlib.pyplot as plt
import matplotlib.ticker as mtick
from matplotlib import ticker, cm
from matplotlib import ticker
from scipy.optimize import minimize
from scipy.optimize import Bounds
```

In [11]:

```
def interpolate(x, xs, ys):
    '''Must be Numpy Format'''
    if len(xs)!=len(ys):
        raise Exception("Arrays not of the same length")
    xs = xs.flatten()
    ys = ys.flatten()
    if xs[-1]<xs[0]:
        xs = np.flip(xs)
        ys = np.flip(ys)
    ans = None
    for i in range(len(xs)):
        if x > xs[i]:
            continue
        else:
            if x==xs[i]:
                ans = ys[i]
            else:
                if i>0:
                    xGrad = (x-xs[i-1])/(xs[i]-xs[i-1])
                    yDiff = ys[i] - ys[i-1]
                    ans = xGrad*yDiff + ys[i-1]
                break
            else:
                ans = ys[i]
                break
    ans = ys[-1] if ans==None else ans
    return ans
```

In [ ]: