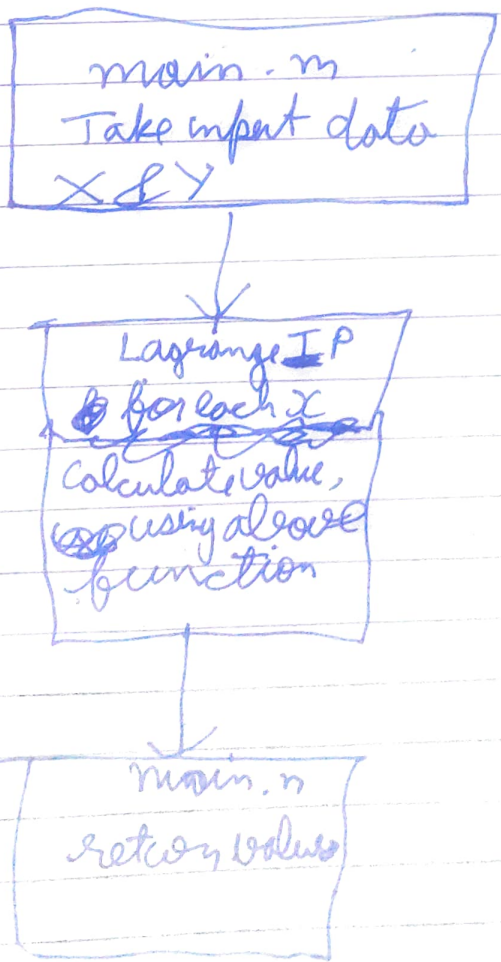
2000 20038

Lagrange Interpolation

Method:

$$y = \frac{y_1 (x - x_2)(x - x_3) \cdots (x - x_n)}{(x_1 - x_2)(x_1 - x_3) \cdots (x_1 - x_n)} + \cdots \frac{y_n (x - x_1)(x - x_2) \cdots (x - x_{n-1})}{(x_n - x_1)(x_n - x_2)(x_n - x_3) \cdots (x_n - x_{n-1})}$$



Cubic Spline method.

method

Given n points

Assume n-1 cubic equations

$a_i x^3 + b_i x^2 + c_i x + d_i$

~~Assume equation in first~~

Total of $4 \times (n-1) = 4n-4$ unknowns.

Equations used to solve.

foreach interval equation satisfying values.

$f_i(x_i) = y_i$

$f_i(x_{i+1}) = y_{i+1}$

By this $2n-2$ equations generated.

By equating derivatives we get $n-2$

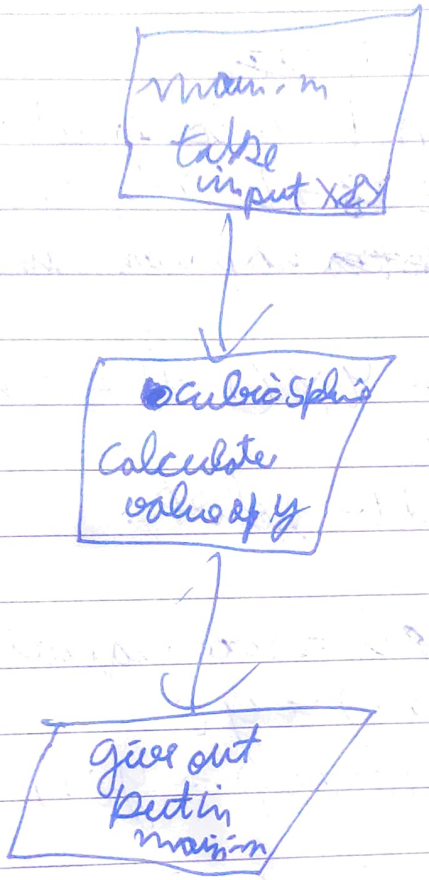
By equating second derivatives we get $n-2$ eqn.

& if we assume first interval to be linear we get 2 equation.

so total of $4n-4$ eqn.

DATE : / /
PAGE NO. :

Flowchart :



x	Lagrange I.P y = f(x)	Cubic spline
0.5	0.2351	0.2351
1.5	0.6881	0.6881
2.5	0.8629	0.8629
3.5	0.9242	0.9242
4.5	0.9531	0.9531
5.5	0.9679	
6.5	0.9770	
7.5	0.9823	
8.5	0.9872	
9.5	0.9844	