Linear Spline Interpolation

Instructions

1. ***Use Python3***
2. ***Use any editor of your choice (eg: Atom) to implement the Algorithm***
3. ***Run your Implementation against the given Test Equations***
4. ***Research and provide additional Test Equations***
5. ***Push the Code and Test Output on Github***
6. ***Publish the link on Moodle***

Aim

Implement the Linear Spline Interpolation Algorithm in Python.

Background

Interpolation is a method of constructing new data points within the range of a discrete set of known data points.

The Algorithm

1. Given a set of known data points and their values:-

Data Point	Value
a	g
b	h

Data Point	Value
g	i
i	j
k	k
m	k

where value(a)=g and so on. Calculate value of a data point “d” when it falls in the range of the supplied data but does not appear in it.

2. Find out the two data points in between which “d” lies. Assume in this case “d” lies between “b” and “g”.

3. Estimate the value of data point “d” as below:-

$$value(d) = value(b) + \frac{value(g) - value(b)}{(g - b)}((d - b))$$

4. Print the value of data point d

Assignment

1. Implement the Linear Spline Interpolation Method in Python

2. Given below is the speed of a vehicle at different times:

Time (s)	Velocity (m/s)
0	0
10	227.04
15	362.78
20	517.35

Time (s)	Velocity (m/s)
22.5	602.97

i. Find speed at 14s

ii. Find speed at 19s

iii. Find speed at 21s

References

https://en.wikipedia.org/wiki/Spline_interpolation

https://en.wikipedia.org/wiki/Interpolation