CSE330 Assignment 02

Deadline: **February 09 2024 11:59 PM** || **Total Marks: 15**

Question 01

1. Consider the following table of data points/nodal points:

Time (sec)	Velocity, v(t) (ms^{-1})
2	10
4	20
6	25

a. [4+1 marks] Find an interpolating polynomial of velocity that goes through the above data points by using Vandermonde Matrix method. Also compute an approximate value of acceleration at Time, `t=7` sec.

b. [4 marks] Find an interpolating polynomial of velocity that goes through the above data points by using Lagrange method.

c. [1 mark] If a new data point is added in the above scenario, which method you should use in finding a new interpolating polynomial. Also what will be the degree of that new polynomial?

Question 02

[5 Marks] Consider the function $f(x) = 2\cos x + 3\sin x$. Evaluate the upper bound of the interpolation error using Cauchy's theorem for nodes $\{-\pi/3, 0, \pi/3\}$. Keep up to 6 significant figures.