Session 6: Assignment 1

Program:

Problem Statement 1:

Write a function so that the columns of the output matrix are powers of the input

vector.

The order of the powers is determined by the increasing boolean argument. Specifically,

when increasing is False, the i-th output column is the input vector raised element-wise

to the power of N - i - 1.

Code :

“”” Import Numpy Library”””

import numpy as np

from numpy.core.numeric import (

multiply,

asarray,

)

“”” Function to generate a Vandermonde matrix.”””

def vander(x, N=None, increasing=False):

x = asarray(x)

if x.ndim != 1:

raise ValueError("x must be a one-dimensional array or sequence.")

if N is None:

N = len(x)

v = empty((len(x), N), dtype=promote\_types(x.dtype, int))

tmp = v[:, ::-1] if not increasing else v

if N > 0:

tmp[:, 0] = 1

if N > 1:

tmp[:, 1:] = x[:, None]

multiply.accumulate(tmp[:, 1:], out=tmp[:, 1:], axis=1)

return v

Output:

