భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్
भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Introduction to Parallel Scientific Computing

(ME5470)

Department of Mechanical and Aerospace Engineering

Instructor: **Niranjan S Ghaisas**

Assignment 1

Name: Abhijeet Anand Burbure

Roll No.: ME24MTECH11016

Q1)

Answer:

a) n =4000

for ASCII (format_flag = 0) format storage memory is **320MB**.

for Binary (format_flag = 0) format storage memory is **123MB**.

b) The size of the array in memory can be calculated as:

Size in memory (bytes) $= n^2$ * Size of one double

For a double-precision floating-point number, the size is 8 bytes.

Size in memory = 4000^2 * 8 = 128,000,000bytes

=122.7MB.

So, the array in memory occupies 122.7 MB.

Memory Size: The array in memory is allocated dynamically, and the size can be directly calculated as shown above. For an array of n x n doubles, the memory size is proportional to n^2 * 8 bytes.

Disk Size: The disk size of the array depends on how the data is saved. There are two possible formats in the code: ASCII format and Binary format

- So, the size of memory is 128mb and size on disk varies as it depends on format which it is saved. For ASCII it takes 320mb and for binary it takes 123mb (for n =4000).
- For large data files binary format would be best fitted as it occupies less memory as compared to ASCII format.

Q2)

Answer: The code takes n values from input.in then takes the corresponding matrix and compare the eigenvectors from the file if it is eigenvector then it prints the eigenvalue also.