

HW1 Report

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Q1. (b)

```
me22btech11009@edison9:~/hw1$ls
a.out  array_004000_asc.out  array_004000_bin.out  hw1-ashishsam1310
me22btech11009@edison9:~/hw1$du -sh array_004000_asc.out
320M   array_004000_asc.out
me22btech11009@edison9:~/hw1$du -sh array_004000_bin.out
123M   array_004000_bin.out
me22btech11009@edison9:~/hw1$
```

Disk Space: As seen from the above image, the ASCII file takes up 320 MB of space, while the binary file takes up 123 MB of space.

Memory size = $8 \times n^2 = 8 \times 4000^2 = 128 \times 10^6$ bytes = 128 MB. Memory size is the same for both ASCII and Binary files.

In ASCII format, each number takes up around 20 bytes (the file is human readable), so the size on disk is 320 MB. For Binary format, each number takes 8 bytes, which gives the size as 128 MB (~123 MB).

Binary is best suited for saving large data, as it is more compact and takes much less disk size.

Q2.

```
me22btech11009@edison9:~/hw1/hw1-ashishsam1310/inputfiles$vim q2nn.c
me22btech11009@edison9:~/hw1/hw1-ashishsam1310/inputfiles$vim input.in
me22btech11009@edison9:~/hw1/hw1-ashishsam1310/inputfiles$gcc q2nn.c
me22btech11009@edison9:~/hw1/hw1-ashishsam1310/inputfiles$./a.out
vec_000003_000001.in:Yes:-6.000000e+00
vec_000003_000002.in:Yes:-6.000000e+00
vec_000003_000003.in:Yes:-1.000000e+00
vec_000003_000004.in:Not an eigenvector
```

Sample output (input.in contains 3)