Walchand College of Engineering, Sangli
Department of Computer Science and Engineering

Class: Final Year (Computer Science and Engineering)

Year: 2021-22 **Semester:** 1

Course: High Performance Computing lab

ESE Exam

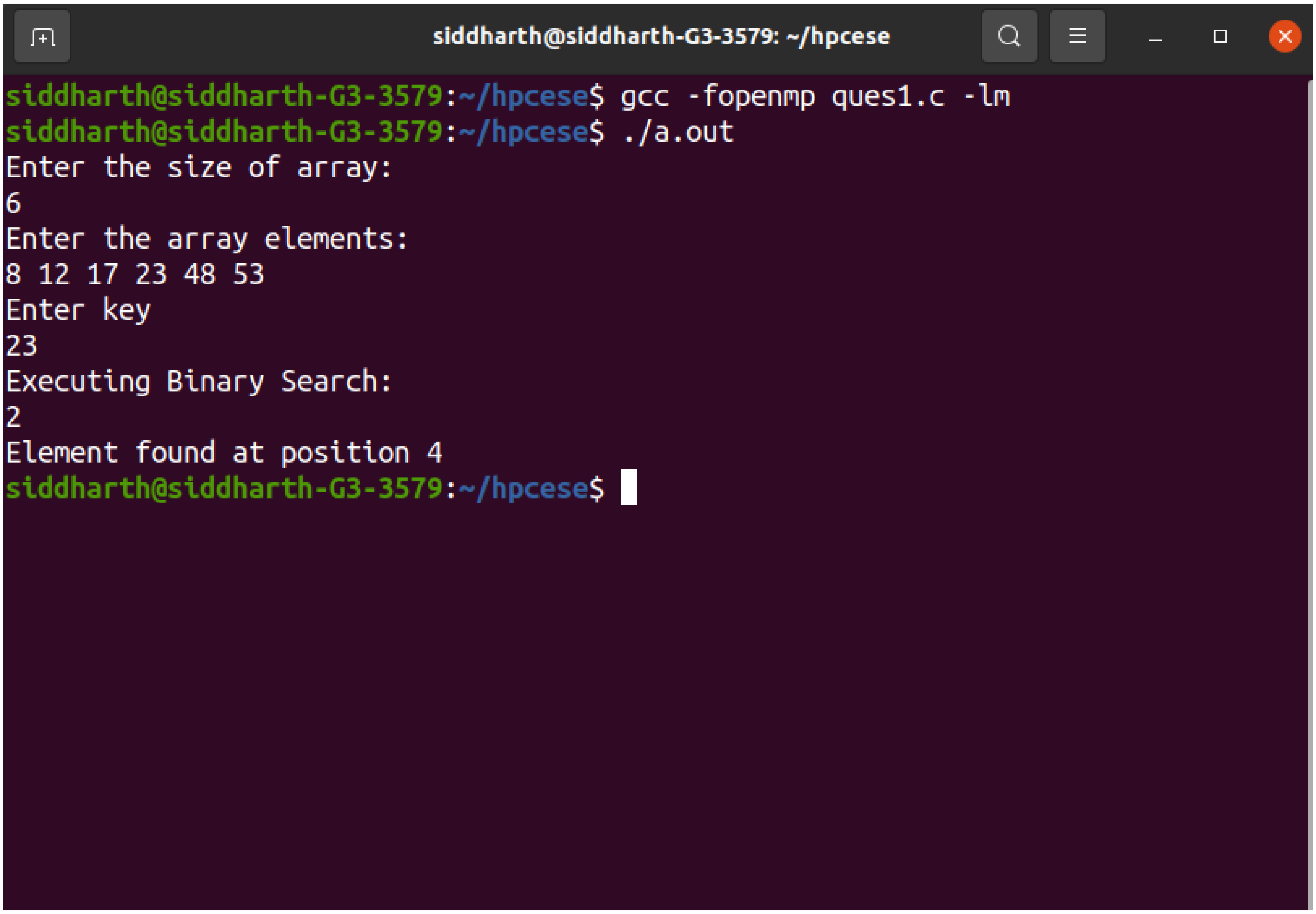
24/11/2021 01.00 PM – 04.00 PM

Exam Seat No: 2018BTECS00001

Name: Siddharth Sunil Satpute
Exam Seat Number: 2018BTECS00001

Problem Statement 1 : Implement Binary Search using OpenMP.

Screenshot 1:



```
siddharth@siddharth-G3-3579:~/hpcese$ gcc -fopenmp ques1.c -lm
siddharth@siddharth-G3-3579:~/hpcese$ ./a.out
Enter the size of array:
6
Enter the array elements:
8 12 17 23 48 53
Enter key
23
Executing Binary Search:
2
Element found at position 4
siddharth@siddharth-G3-3579:~/hpcese$
```

Information:
<u>Compilation command</u>: - gcc -fopenmp ques1.c -lm

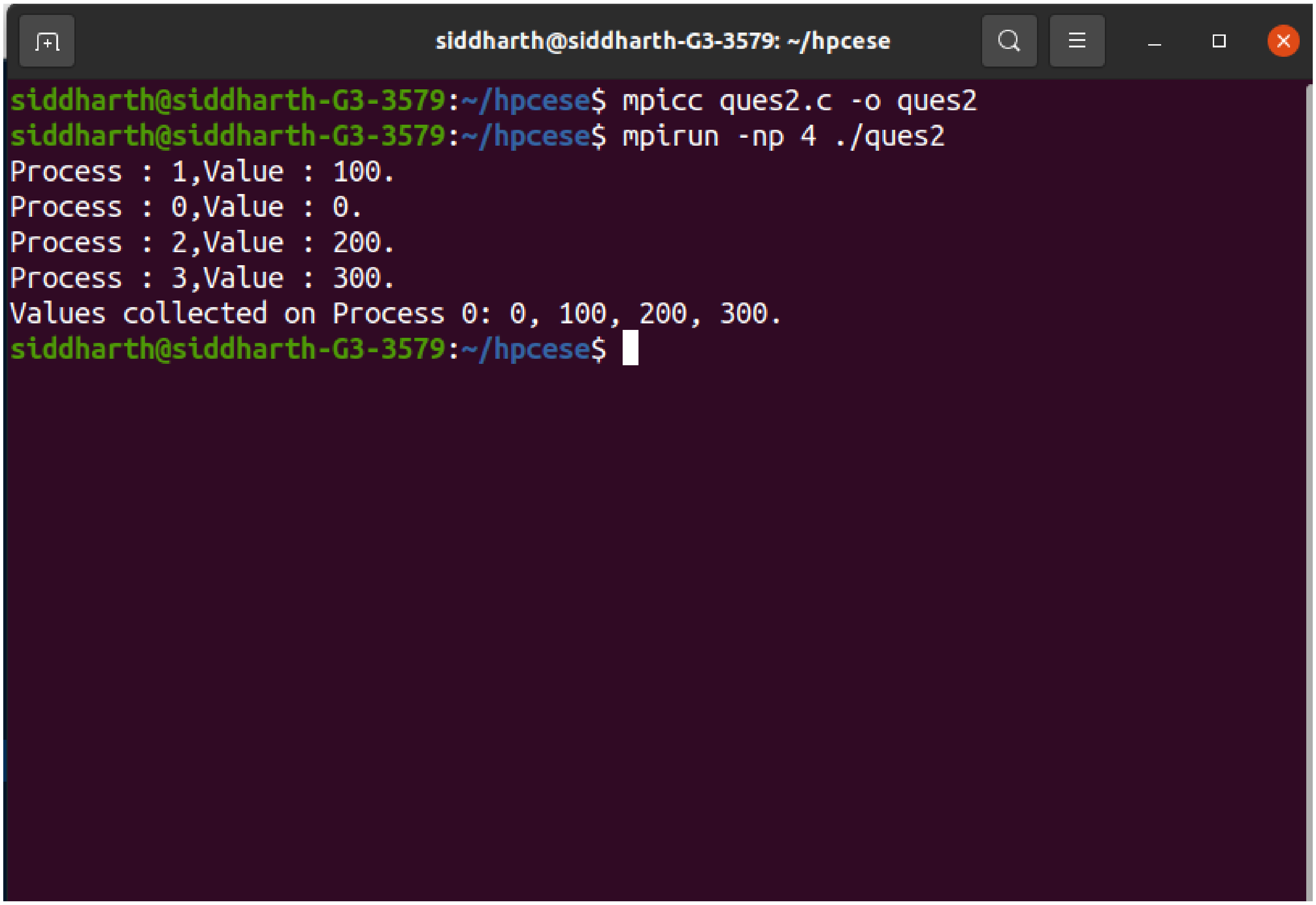
Execution command: - ./a.out

This searches the key element and displays the position at the console.

Problem Statement 2

Statement: Implement MPI program to gather the data from n processes to root process.

Screenshot #1:



```
siddharth@siddharth-G3-3579:~/hpcese$ mpicc ques2.c -o ques2
siddharth@siddharth-G3-3579:~/hpcese$ mpirun -np 4 ./ques2
Process : 1,Value : 100.
Process : 0,Value : 0.
Process : 2,Value : 200.
Process : 3,Value : 300.
Values collected on Process 0: 0, 100, 200, 300.
siddharth@siddharth-G3-3579:~/hpcese$
```

Information:
Compilation command: - mpicc ques2.c -o ques2
Execution command: - mpirun -np 4 ./ques2

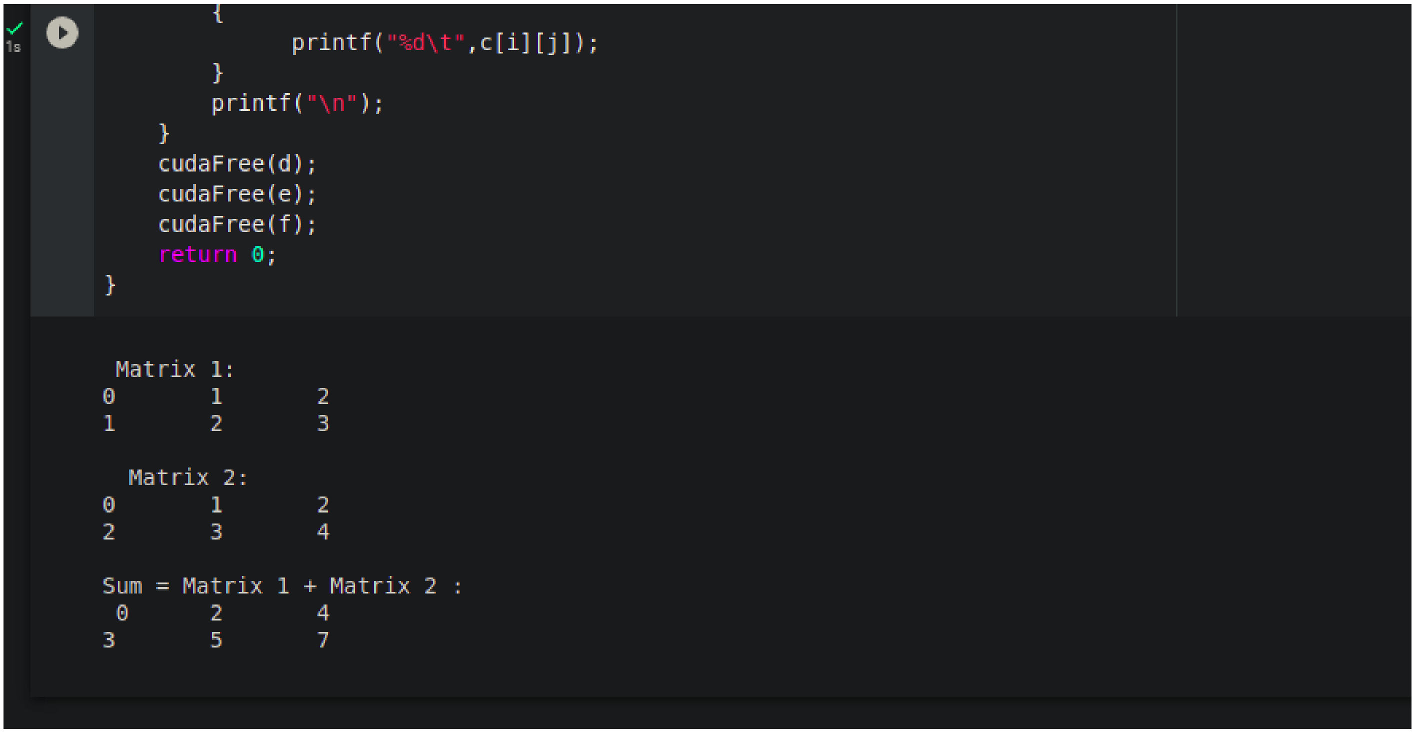
Here the MPI code runs with gather clause that collects the values of individual processes in the root process.

Problem Statement 3

Statement:

Implement Matrix scalar addition using CUDA.

Screenshot 1:



```
        {
              printf("%d\t",c[i][j]);
        }
        printf("\n");
    }
    cudaFree(d);
    cudaFree(e);
    cudaFree(f);
    return 0;
}
```

```
 Matrix 1:
0       1       2
1       2       3

  Matrix 2:
0       1       2
2       3       4

Sum = Matrix 1 + Matrix 2 :
 0      2       4
3       5       7
```

Information:

Compiled and ran the code on Google Collab for Matrix Addition.

GitHub Link:

https://github.com/siddharth810/HPC-ESE