

CODE

DistributedSum.py

```
from mpi4py import MPI
import numpy as np

def distribute_elements(array, comm):
    n = len(array)
    local_n = n // comm.Get_size() # Compute the local size of the array
    local_array = np.empty(local_n, dtype=int) # Create an empty array to store the local elements
    comm.Scatter(array.tobytes(), local_array, root=0) # Scatter the elements from the root process to all processes
    local_sum = np.sum(local_array) # Compute the local sum of the elements
    return local_sum

if __name__ == '__main__':
    comm = MPI.COMM_WORLD
    rank = comm.Get_rank() # Get the rank of the current process

    if rank == 0:
        n = 100 # specify the total number of elements
        array = np.arange(1, n + 1) # Generate an array of numbers from 1 to n
    else:
        array = None

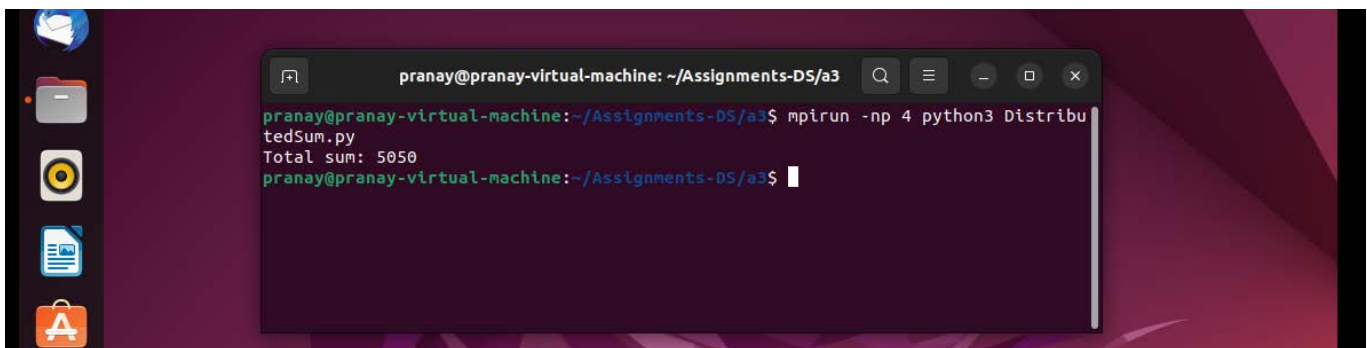
    array = comm.bcast(array, root=0) # Broadcast the array from the root process to all processes

    local_sum = distribute_elements(array, comm) # Compute the local sum of elements for each process

    all_

    if r
    {
    }
```

OUTPUT



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pranay@pranay-virtual-machine: ~/Assignments-DS/a3
pranay@pranay-virtual-machine:~/Assignments-DS/a3$ mpirun -np 4 python3 DistributedSum.py
Total sum: 5050
pranay@pranay-virtual-machine:~/Assignments-DS/a3$
```