**20BCE1025**

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# Parallel and Distributed Computing(CSE4001)

## Lab 8 - MPI Basics

The gravitational N-Body problem relies on two of

Newton’s Laws– Newton’s Law of Gravitation, as in (1);

two bodies, B i and B j of mass m i and m j are attracted to

~i j , which is inversely proportional

each other by a force F

to the square of the distance between them, r i j (G is

Universal Gravitational Constant) and Newton’s Second

Law of Motion, as in (2); a body, B i , of mass m i will

experience an acceleration, ~

a i , if it experiences a force of

~i (force due to all the bodies in the system,

magnitude F

P

~

j 6=i F i j ).

**Code:**

#include <mpi.h>

#include <stdio.h>

int main(int argc, char\*\* argv) {

// Initialize the MPI environment

MPI\_Init(NULL, NULL);

// Get the number of processes

int world\_size;

MPI\_Comm\_size(MPI\_COMM\_WORLD, &world\_size);

// Get the rank of the process

int world\_rank;

MPI\_Comm\_rank(MPI\_COMM\_WORLD, &world\_rank);

// Get the name of the processor

char processor\_name[MPI\_MAX\_PROCESSOR\_NAME];

int name\_len;

MPI\_Get\_processor\_name(processor\_name, &name\_len);

// Print off a hello world message

printf("Hello world from processor %s, rank %d out of %d processors\n", processor\_name, world\_rank, world\_size);

// Finalize the MPI environment.

MPI\_Finalize();

}

**Running:**

