Assessment No. : FINAL EXAM

School of Computer Science and Engineering FALL 2021 – 2022

CSE4001: Parallel and Distributed Computing

SLOT: L55+L56

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Reg No: 19BCE22500 Slot: L55+L56 Course: CSE4001

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Group: A

Aim

00118BCE22500190 1911 101A 1911	
Aim :-	
Assume the variable rank contains the process ro	ank_
and root is 3. Amening for XITI	
Considering array int b[v] = {0,0,0,0} and	
TUP (101), TIPL OWNER (2 JOHN)	ITNT,
root, MPI COMM WORLD);	

Source Code

Source code :- (1910) 1911 Apr (2010)
#include (stdio.h)
include < Stdlib-h>
include <stdlib.h> # include <mpi.h></mpi.h></stdlib.h>
int main (int argc, char ** argv) { // 19BCE2250- Ishan Jogalekar // Starting of MPI interface
1/19BCE2250- Ishan Jogalekar
1/ Starting of MPI interface
(Anny == 1001
MPI Init (large, largu);
William Tom I sullow & 19th Day 140

: 10 - 12 - 2021 19BCE2250

Dated : 10 - 12 - 2021Assessment No. : FINAL EXAM

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1/1 size of processes.
int size;
MPI COMM Size (MPI COMM WORLD, & size);
-43 911 <u>-43 911</u>
// Array initialization
int b[4] = {0,0,0,0};
if (size 1=4)
P.: 15 (114): : : : : : : : : : : : : : : : : : :
Printf ("Minimum running requirements: 4 processes, VO"); MPI_Abort (MPI_COMM_WORLD_EXIT_FAILURE);
THE ABOUT CHEL COMM MOKED BY I FAILURE);
The sale of the sa
// Fix root processors mak
int root = 3;
1 To 1 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
"Get mak of process
MPT_COMM_rank (MPI_COMM_WORLD, & rank);
THE COMM YORK CHEL-COMM-WORLD, & JONK);
11 Define value in array
int value - ronk *11;
printf ("process x.d - value = x.d in", rank, value);
// if root process running printout MPI Gather function with root process.
9 C / Y and V 100 - 10
$\frac{1f(\text{rank} = \text{root})}{}$
MOT Cather Ovalue I NOT THE AND 1
MPT Gather (Evalue, I, MPT - INT, 101); MPI - INT, root, MPI - COMM WORLD);
12-11/1) 100 C) 1112 COITE WORLD)

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printf ("Array on (root) process xd; [xd, xd, xd]n", rank, b[o], b[1], b[2], b[3]);
rank broz briz brzz brzz);
a control in the in the in the in the internal in
else {
MPI Gather (Walve, 1, MPI-INT, NULL, O, MPI INT,
FI COMMWORLD: TAM, FOOT
when to be salt niches or some the best work
printf (" Array elements collected on process red:
printf (" Array elements collected on process rd: [1.2,1.d, 1.d, 1.d, 1.d] \n", rank, b[0], b[1], b[2],
Marie 1 1 1 637); which may two you
And the I broke to a superior to make the many
VEND of MPI interface
MIR MMPI Finalize(); Still MMM TIM
Mill Succession EXIT_SUCCESSION 20000000
10 1 a la la si si si si la

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Conceptual Discussion:

Conceptual discussion:	
· MPI.h header file to use all mpi function program.	ioside
a MDT CAMM DOOK in the state of the state of	
MPI Comm Rank is process identifier, to get york of processes or roburn the id of each	
processes.	
· Here root rank consider to be 3 (alven	
hence root rank consider to be 3 (gluen, hence root variable is initialized and se	1 10
- MPI_comm Size is used to determine size processes pool that here considering many is allowed or size is set to 40	of Eximun
· Using array b of integers adding each e = element "1 : here element is reffered	11.
running through each processes.	uhile
 MPI Gathor used to take elements from many processes & gathers them to one processes. 	om Single
· Using if statement, at yout rank i.e. 3rd p MPI Gally is used and MPI Finalize() function used to end the MPI interface.	101955
TUDITION USED TO POOL IN MP I THEY ALL	11

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Execution Output :

P. Terminal
14:22:54-ishan@ishan-ubuntu:~/PDC lab/FAT\$mpicc c1.c -o c1
14:22:56-ishan@ishan-ubuntu:~/PDC lab/FAT\$mpirun -n 4 ./c1
Process 0 - value = 0
Array elements collected on process 0: [0,0,0,0]
Process 1 - value = 1
Array elements collected on process 1: [0,0,0,0]
Process 2 - value = 2
Array elements collected on process 2: [0,0,0,0]
Process 3 - value = 3
Array on process(root) 3: [0,1,2,3]
14:22:57-ishan@ishan-ubuntu:~/PDC lab/FAT\$

Results

Results:	(S)
	ilan ali A
· mpice cl.c - D	c, command used to compile
the MPI program	and mpirum -n 4 ·/c/
command is used	to my modram with
U proceess.	to run program with
	- FRANK BAINS LT
· At process o vo	due of array is 0 so collected
element will be	DO DOLY TO TO A DOLO ?
At process 1 som	e thing will happened but
this time walle	incremented to 1.
valle = 2 and	for process 2 it is value=2.
troffic harman	ekseria irrainat kind?
. Now at process 3	Nalue = 3 This is root
process as mer	Hinned in question. MPI Gather
function with is	Highed in question. MPI Gather initialize over array b
with value on	d root rank
1 1 10 10 1	The state of the s
Menco, out van	k 3 7 [0,1/2,3] 0 0 0
have all walk	es of each processes are.
actived in sin	k3:[0,1,2,3] les of each processes are fle processes.
Janua 11 Stu	Are broaden

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Review Question

: [Viva-Voce]

1	6
	Review question:
*	[19] 교회 설립하다 [1] 관업되었다는 그림 그리 등 그리 이 다른 그리 등 나는 사람
1.	write importance of shared and distributed memory to signify interprocess communication
	to signify inter process communication
->	Shared memory:
1 4	THE THE VIEW IS SEATON IN PARTIES AS A P. LEWIS CO. LEWIS CO. LEWIS CO., LANSING MICH.
	· shared memory is remory system in which memory is crecessed by my Hiple program running on that system simultaneously.
1	memory is accessed by my Hiple program rynning
	On that system simul fareously:
1.	
	· Shared memory provides communication without reduced and capies.
4544	reduandant capies.
144	hada a san a s
	. It is efficient means of possing data between
	It is efficient means of passing data between Several programs.
OTTO SANGEROUS	
	· In case of IPS models, shared memory systems are easy to implement using simple programming:
3) ± {	systems are easy to implement using simple
	programming
	· It is fostest way to communicate directly in
	inder process communication.
	But the disadvantage is it can create problem In synchronization & number protection. Eg: soloris · 2.0 is based on shared memory
	In synchronization & memory protection;
	tg: soloris . 2.0 is based on shared memory
	System.

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	1
Distributed memory:	
· Memory in which each processor is private memory apart from commo pool is distributed memory system.	having own
· Distributed memory offers unified of for each processor.	iddress space
· Distributed monory excludes race co shared memory.	ndition in
Distributed shared memory is easi machine (hardwax) rather than perfor algorithm.	er to design
phase between procusors that wi the throughput of each processors	ixchange 11 increase
· Distributed nemony provides large number space than shared number.	virtual
· Distributed memory provides Scalability Scales are very good even in large process nodes.	ly that is numbe of