

Unit 8 - Week 6

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<ul style="list-style-type: none"> Lecture 26 : Domain decomposition based parallelization of matrix solvers Lecture 27 : Domain decomposition based parallelization of matrix solvers (continued) Lecture 28 : Domain decomposition based parallelization of matrix solvers (continued) Lecture 29 : MPI routines for parallel matrix solvers Lecture material of Week 6 Quiz : Week 6 Assignment 6 Week 6 Feedback Form
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Week 6 Assignment 6

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-10-28, 23:59 IST.

- 1) Which of these factors are favorable for getting good computational performance in domain decomposition based MPI program? 1 point
- a. Less number of iterations due to smaller local matrices
b. Better accuracy
c. Less memory storage due to local small block matrices
d. Dynamic exchange of data through boundary points
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 2) Good load balancing in a domain decomposition method is required to obtain low communication overhead 1 point
- a. True
b. False
- a.
 b.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 3) In a domain decomposition based parallel matrix solver program, collective communication call is essential for 1 point
- a. interdomain data exchange
b. Synchronization among each domain
c. Finding global convergence
d. Writing final result
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 4) Which of these steps can reduce data transfer overhead in a domain-decomposition based MPI implementation? 1 point
- a. Reduce the inter-domain boundary points during decomposition
b. Put the data to be transferred by a send call into 1-D buffer with contiguous memory locations
c. Transfer data with as many processors as possible
d. Transfer data with neighboring processors
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a.
b.
d.
- 5) In domain decomposition algorithm, the solution variables and the guess values are allocated in 1 point
- a. In global memory but with local size
b. In local memory but with global size
c. In local memory with local size including overlaps
d. In local memory with local size without overlaps
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
- 6) In domain decomposition, the main problem is solved as multiple small matrix problems pertaining to each subdomain. The boundary conditions for each local matrix problem is specified at the physical boundaries of the main domain. Interdomain boundaries do not need any boundary condition. 1 point
- a. True
b. False
- a.
 b.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 7) A new communicator specific to domain decomposition in a Cartesian domain can be created using MPI function 1 point
- a. MPI_COMM_WORLD
b. MPI_CART_CREATE
c. MPI_CART_SHIFT
d. MPI_COMM_SPLIT
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
- 8) With six basic functions any MPI program can be written. However, MPI has other functions. These large sets of functions add some favorable features to MPI. However, the following feature(s) cannot be augmented by MPI functions in a parallel distributed memory code. 1 point
- a. Portability
b. Flexibility
c. Cache coherence
d. Thread safety
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.
d.
- 9) A new communicator has to be created by deleting some of the processors from the older communicator group. Which functions are to be used for that 1 point
- a. MPI_Group_excl and MPI_Comm_create
b. MPI_Cart_create
c. MPI_Finalize and MPI_Init
d. None of these
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
a.
- 10) Which component of a matrix solver is parallelized in a MPI based data parallel implementation? 1 point
- a. Finding the new residual
b. Convergence check
c. Matrix vector product
d. Matrix inversion
- a.
 b.
 c.
 d.
- No, the answer is incorrect.
Score: 0
Accepted Answers:
c.