Technological Institute of the Philippines

938 Aurora Blvd. Cubao, Quezon City

College of Computer Studies

CS 007 - Parallel and Distributed Computing

Prelim Period

Define the following key terms. Please follow the sample below in defining each term. (20 points)

Parallel Algorithm

In computer science, a parallel algorithm is a procedure that breaks a problem down into smaller issues, solves each one at the same time on several processors, and then combines the answers to create the ultimate solution [1]. This method improves computing efficiency and speed, especially for complicated and large-scale issues [2].

Concurrent Processing

Concurrent processing boosts system performance and resource usage by enabling several jobs or processes to run concurrently within a computing system [3]. Through the use of techniques like multitasking, multithreading, and multiprocessing, it permits overlapping execution, which enhances responsiveness and performance while managing challenging computing tasks [4].

Multiprocessors

Computer systems having two or more central processing units (CPUs) that cooperate to share memory and carry out tasks more quickly are known as multiprocessors [5]. These systems are made to carry out several tasks at once, which improves computational dependability and speed [6].

Multicomputers

Multicomputers are systems made up of several separate computers that interact with one another and share information via a network [7]. In a multicomputer system, every computer functions as an independent node inside the broader network and has its own memory [8].

Distributed system

A distributed system is a group of separate computers connected by a network that cooperates to accomplish a shared objective and presents itself to the user as a single, cohesive system [9]. These systems increase efficiency, fault tolerance, and scalability by dividing up processing duties among several processors [10].

Time Complexity

A computing term known as time complexity quantifies how long an algorithm takes to execute based on the length of the input [11]. It aids in assessing the effectiveness of various algorithms by offering a theoretical estimation of the running time [12].

Data parallelism

When an action is carried out concurrently on several data components, usually utilizing several processors, it is referred to as data parallelism [13]. By splitting up big datasets into smaller pieces that are handled in parallel, this approach helps to speed up data processing operations [14].

Hybrid algorithm model

In order to capitalize on the advantages of each algorithmic technique and improve performance or accuracy, a hybrid algorithm model mixes them all [15]. This paradigm is frequently applied in situations involving intricate problem-solving when a single algorithm might not be adequate [16].

Point-to-Point Communication

The direct data transmission between two different sites, or nodes, in a network is referred to as point-to-point communication [17]. Precise and effective data transfer is ensured by this kind of communication, which is crucial for a variety of networking and parallel processing activities [18].

Hypercube Network

A multi-dimensional cube structure connected by several processors is known as a hypercube network [19]. A hypercube network's processors are connected to one another in a way that promotes fault tolerance and effective data routing [20].

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Honor Pledge

“I affirm that I have not given or received any unauthorized help on this assignment and that all

work shall be my own.”

<Bryan Dominick A. Tiamzon>