Quick Revision Notes

What is Parallel Computing?

Doing many tasks at the same time using multiple processors (computers or cores) to finish a job faster.

What is Parallel Reduction?

A way to combine data (like adding numbers) faster by doing the combining in parts, all at once, using many processors.

What is CNN (Convolutional Neural Network)?

A special kind of AI model used mostly to look at pictures and understand what's in them (like faces, objects, etc.).

What is RNN (Recurrent Neural Network)?

A model that works well with data that comes in a sequence, like sentences, music, or stock prices. It remembers previous steps.

What is DNN (Deep Neural Network)?

A DNN is a computer model made of many layers. It learns from data to do things like predict or classify information.

What is a Dense Layer?

A layer in a model where each unit is connected to every unit in the next layer. It helps mix and learn from all data.

What is an Activation Layer?

It adds smartness to the model by deciding which neurons (units) should be active or not, helping the model understand more complex things.

What is a DL (Deep Learning) Application?

A real-world use of deep learning, like: Face unlock on phones, Chatbots, Self-driving cars, Voice

assistants (like Alexa).

What is AI and ML?

AI (Artificial Intelligence): When machines try to act like humans. ML (Machine Learning): When machines learn from data and improve on their own.

Types of Sorting

Ways to arrange data in order: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Quick Sort, Heap Sort, Counting Sort, Radix Sort.

What is Scalability in HPC and DL?

In HPC: Adding more computers to solve bigger problems faster. In DL: Training bigger models or more data using more GPUs or CPUs.

Types of Learning

Supervised - learn from labeled data; Unsupervised - find patterns in unlabeled data; Reinforcement - learn by trying; Semi-supervised; Self-supervised.

Load Balancing

Sharing work equally among computers so that all work efficiently and no one is overloaded.

What is OpenMP?

A tool to make programs run faster by allowing parts of code to run at the same time using multiple CPU cores.

What is a Cluster?

A group of connected computers that work together to act like one powerful machine.

What is Scikit-learn (sklearn)?

A Python tool to easily build machine learning models like classification, regression, and clustering.

What is TensorFlow?

A powerful library (made by Google) to build deep learning models and train them using large amounts of data.