**BTP II**

**Task 1**

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**NetCDF (Network Common Data Form):**

* It is a file format and set of software libraries widely used in scientific research, particularly in atmospheric and environmental sciences.
* NetCDF excels in representing multidimensional arrays, making it suitable for storing datasets with multiple dimensions like time, latitude, and longitude in climate science.
* Each NetCDF file includes metadata providing crucial information about variables, dimensions, and attributes, facilitating efficient data interpretation and usage.
* NetCDF is optimized for efficient Input/Output (I/O) operations, making it suitable for handling large datasets commonly encountered in climate and atmospheric research.
* NetCDF files are portable i.e., platform-independent, allowing seamless sharing and access across different operating systems.
* It has a large community
* Our task was to do an analysis and make a report on a random NetCDF file from the provided dataset and merge all of them into one.

***Analysis (****tos\_Omon\_EC-Earth3-CC\_historical\_r1i1p1f1\_gn\_185001-185012.nc****)***

**Dimensions:** There are three main dimensions of the given NetCDF file – Time Dimension(time), longitude dimension and latitude dimension.

1. Time Dimension (time):

* Contains twelve-time steps, representing each month of the year.
* Time values are in the datetime64 format, ranging from January 16, 1850, to December 16, 1850.
* Represent two bounds associated with each time stamp, defining the start and end of the time intervals.

1. Longitude Dimensions:

* Consists of 144 longitudinal positions.
* Ranging from 0.0 to 357.5

1. Latitude Dimension

* Consists of 48 latitudinal positions.
* Ranging from -88.12 to 88.12

**Coordinates:**

1.Time Coordinate(time): Provides the timeline of the dataset, pinpointing the midpoint of each month.

2.Longitude and Latitude Coordinates: Represent the geographical positions corresponding to the grid of sea surface temperature data.

**Data Variables:**

**1.**Time Bounds(time\_bnds): A 2D variable representing starting and ending of time intervals.

**2**. Sea Surface Temperature(tos): Represents the sea surface temperature.

**Summary**:

This dataset holds a lot of information about the simulated sea surface temperature by the EC-Earth3-CC climate model for the year 1850. It covers the details about where and when the temperature simulated (position and time). In other words, it a detailed map of sea temperatures throughout the year, giving us insights into how the climate model sees and simulates the conditions for 1850.