GHAR SE CODE {

Pandas Syllabus:-

Course Title: Pandas

Course By: GSC (GHAR SE CODE)

Duration: 30 Hrs

Code Spirit: "Be Explicit with Copy vs View"

Module	Topic	Detailed Overview
1	**Introduction to Pandas**	- What is Pandas?- Series vs DataFrame- Installing and importing (import pandas as pd)- Why use Pandas over Excel / NumPy
2	**Creating and Exploring DataFrames**	- Creating Series and DataFrames- From dictionaries, lists, NumPy arrays- Reading CSV/Excel/JSON with read_csv(), read_excel()- head(), tail(), info(), describe()
3	**Indexing and Selecting Data**	- Indexing with loc, iloc, at, iat- Boolean filtering- Setting custom indices- Slicing rows/columns
4	**Data Cleaning & Preparation**	- Handling missing data: isnull(), dropna(), fillna()- Renaming columns, changing data types- String operations- Removing duplicates
5	**Working with Columns**	- Creating new columns- Column-wise operations- apply(), map(), replace()- Conditional columns
6	**Grouping and Aggregating**	- groupby() basics- Aggregation functions: mean(), sum(), count()- Multi-level grouping- pivot_table()
7	**Sorting and Ranking**	- Sorting by values/index- sort_values(), sort_index()- Ranking data with rank()
8	**Merging, Joining, and Concatenating**	- merge(), join(), concat()- Inner, outer, left, right joins- Combining data from multiple sources

Module	Topic	Detailed Overview
9	**Time Series and Date Handling**	- Converting to datetime: to_datetime()- Time-based indexing- Resampling, rolling windows, date range generation
10	**Working with Files**	- Writing to CSV/Excel with to_csv(), to_excel()- Reading/writing compressed files- Handling large files with chunks
11	**Visualization (with Matplotlib/Seaborn)**	- Basic plotting: plot(), hist(), boxplot()- Visualizing grouped data- Integrating with Seaborn
12	**Performance and Efficiency**	- Vectorization- Avoiding loops- Memory usage optimization- Categorical types
13	**Real-World Use Cases**	- Data wrangling on sample datasets- Cleaning messy Excel sheets- Joining financial datasets- Analyzing surveys or CSV logs
14	**Capstone Project**	- Apply everything: cleaning, merging, grouping, and visualizing- Example: sales dashboard, survey report, COVID-19 tracker

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