DATA ANALYST ROADMAP

What is Data Analytics?

Data Analytics is about examining data to find useful information. It helps businesses make smart decisions, improve their operations, and discover new opportunities by cleaning, transforming, and modeling data.

What Does a Data Analyst Do?

A Data Analyst collects, processes, and analyzes data to find trends and insights. They help organizations make data-driven decisions.

Steps in Data Analysis:

Define the Objective:

- Understand the business problem and set clear goals for what you want to achieve with the analysis.

Data Collection:

- Identify where to get the data from and collect data from the identified sources.

Data Cleaning and Preprocessing:

- Remove duplicates, fix errors, and handle missing data and transform the data into a usable format.

Exploratory Data Analysis (EDA):

- Look at the data to find patterns and trends and use summaries and visualizations to understand the data better.

Data Modeling:

- Apply statistical & basic machine learning (Optional) models, aggregation to analyze the data and validate the models to ensure they meet the objectives.

Data Visualization:

- Create visual representations like charts and graphs using tools like Excel, Tableau, or Power BI.

Reporting and Interpretation:

- Summarize the results and Provide insights and recommendations based on the analysis.

Communicating Results:

- Present the findings to stakeholders in a clear and understandable way and use simple storytelling techniques to make the data insights relatable.

Let’s Start with our Roadmap !!

Syllabus:

- **Statistics & Mathematics**
- **SQL**
- **MS Excel**
- **Python**
- **Power BI / Tableau**
- **Projects**
- **Pro Tips**

1. Maths & Statistics (□□□□ □):

Statistics & Maths Syllabus:

▪ **Basic Statistics:** Mean, Median, Mode, Standard deviation, Normal distribution, Measure of dispersion with Variance And SD, Percentiles and Quartiles, Probability

▪ **Basic Math:** Arithmetic, Weighted average, Cumulative sum

Resources

NOTE: watch only above mentioned topics from any one of the below mentioned youtube video:

https://www.youtube.com/watch?v=LZzq1zSL1bs

https://www.simplilearn.com/tutorials/statistics-tutorial

Web Resource:

https://news.lunartech.ai/fundamentals-of-statistics-for-data-scientists-and-data-analysts-69d93a05aae7

2. SQL (□□□□ 2 to 5):

SQL Syllabus:

- CREATE, INSERT, UPDATE, ALTER, DELETE, DROP, TRUNCATE & DATA TYPES in SQL **(WEEK 2)**
- SELECT, DISTINCT, WHERE, LIKE, ORDER BY, LIMIT, TOP, AND, OR, NOT, IN, BETWEEN **(WEEK 2)**

  (After Completing above topics from below mentioned resources, Start practicing Easy level questions on Hackerrank. (links of practice websites are also mentioned below))

- SUM, MAX, MIN, COUNT, AVG , GROUP BY, HAVING **(WEEK 3)**
- JOINS - INNER JOIN, RIGHT JOIN, LEFT JOIN, OUTER JOIN & SELF JOIN **(WEEK 3)**

  (After Completing above topics from below mentioned resources, Start practicing Medium level questions on Hackerrank, Leetcode, DataLemur & StrataScratch. (links of practice websites are also mentioned below))

- EXISTS, UNION, UNION ALL, DATE TIME FUNCTIONS, CTE, SUBQUERIES **(WEEK 4)**

- CASE WHEN, WINDOW FUNCTIONS (ROW_NUMBER, RANK, DENSE_RANK, LEAD, LAG, NTILE, FIRST_VALUE, LAST VALUE) **(WEEK 4)**

- AGGREGATE FUNCTIONS AS WINDOW FUNCTIONS **(WEEK 4)**

(After Completing above topics from below mentioned resources, Start practicing Medium level to Hard level questions on Hackerrank, Leetcode, DataLemur & StrataScratch. (links of practice websites are also mentioned below))

(WEEK 5) - Put your SQL knowledge to the test on DataLemur , Hackerrank, Leetcode & StrataScratch by practicing the real SQL interview questions asked by companies like Facebook & Google. Use Below mentioned **Websites for Practice** to practice SQL questions.

SQL Project Link (It is Optional, you can do it for learning):
https://www.youtube.com/watch?v=SAWiIV12sU4

RESOURCES:

Websites:

1. https://www.w3schools.com/sql/
2. https://sqlbolt.com/

Youtube Playlist:

https://youtube.com/playlist?list=PLavw5C92dz9Ef4E-1Zi9KfCTXS_IN8gXZ&si=XCwpStf9zZ0YISN8

This above playlist contains the complete tutorial video of SQL with all the required topics in English.
And if you want to learn in Hindi, then you can follow this below playlist:

https://youtube.com/playlist?list=PLdOKnrf8EcP17p05q13WXbHO5Z_JfXNpw&si=8m4E9IGf-2MR9ZKA

Websites for Practice:

https://datalemur.com/questions?category=SQL

https://leetcode.com/problemset/database/

https://leetcode.com/studyplan/top-sql-50/

https://www.hackerrank.com/domains/sql

https://platform.stratascratch.com/coding?code_type=3

NOTE: Learning by doing is the key to mastering anything, especially for interviews !! So, please focus more on practicing while learning.

NOTE: While learning SQL, create a professional LinkedIn account if you don't have one already, and start sharing your learning experiences there on a daily basis. Try to build relevant connections in the data analytics industry and aim to reach at least 2,000+ connections.

3. MS Excel (□□□□ 6 to 7):

Excel Syllabus:

Data Management & Cleaning (Week 6)

- Removing Duplicates, Text to Columns, Data Validation, Flash Fill

Formula Mastery (Week 6)

- SUM, COUNT, AVERAGE, SUMIFS, COUNTIFS, AVERAGEIFS, VLOOKUP, HLOOKUP, XLOOKUP, INDEX, MATCH, INDEX & MATCH, IF, IFERROR, AND, OR, NOT, Nested Functions, ARRAY Formulas, LET, SUMPRODUCT, INDIRECT, CHOOSE, OFFSET, LEFT, RIGHT

Data Analysis & Reporting (Week 6)

- Pivot Tables & Pivot Charts, Data Sorting and Filtering, Subtotals, Data Tables, Scenarios (What-If Analysis), Goal Seek and Solver

Visualization Expertise (Week 7)

- Conditional Formatting, Basic to Advanced Charting, Creating Dynamic Dashboards

Efficiency Enhancers (Week 7)

- Keyboard Shortcuts (You can get it from ChatGPT), Data Consolidation Techniques, Error Checking

Advanced Excel Capabilities (Week 7)

- Advanced Filter, Slicers and Timelines in Pivot TableS

Start learning Excel with the YouTube playlist provided below -

https://www.youtube.com/playlist?list=PLUaB-1hjhk8Hyd5NiPQ9CND82vNodlFF5

NOTE: If you don't find a specific topic from the syllabus in the playlist above, you can use any YouTube video or web article to understand the concept of that topic.

Websites for Practicing Excel:

1. https://www.excel-easy.com/
2. https://exceljet.net/
3. https://www.excelpracticeonline.com/

And, then Complete below project in Excel -

https://www.youtube.com/watch?v=m13o5aqeCbM

https://www.youtube.com/watch?v=opJgMj1IUrc

NOTE: By now, you have already completed 50% of the Data Analytics syllabus. After this, you can start leveraging LinkedIn to ask for referrals and apply to relevant jobs. Simultaneously, use Naukri.com for job applications. If you want to learn how to effectively use these portals, you can watch my YouTube video linked below.

Youtube video Link: https://youtu.be/KfVkKtncLYE?si=_9rUbHAx7KIn32oi

NOTE: Additionally, you should create an ATS-friendly resume for job applications. If you want to learn how to create an ATS-friendly resume, you can watch my YouTube video linked below.

Youtube video Link: https://youtu.be/IIGWpw1FXhk?si=u1jvQj6JAnI34_z3

4. Python (□□□□ 8 to 10):

Python Programming Syllabus (Week 8) :

- Understanding syntax, variables, and data types like integers, floats, strings, booleans

- Control structures: if-else, Loops (for, while)

- Core data structures: lists, dictionaries, sets, tuples

- Functions , Error handling, lambda functions & try-except

- Using modules and packages

- OOP (Object Oriented Programming) : This you can learn in optional

First, complete the above Python programming Basics using the YouTube video mentioned below.

- https://www.youtube.com/watch?v=kqtD5dpn9C8&t=1786s

- https://www.w3schools.com/python/default.asp
  (Alternatively, use this above website to learn Python and become familiar with Python syntax by doing basic hands-on exercises.)

Then, try to solve the top 30 Python coding questions below in your system environment to gain hands-on experience and start with Python programming -

- https://www.analyticsvidhya.com/blog/2024/05/python-coding-interview-questions-for-beginners/

Then start practicing Python from the websites mentioned below. Focus only on solving basic to medium-level questions from the topics mentioned above. Avoid DSA programming questions **(Week 9)**:

- https://www.hackerrank.com/domains/python

- https://leetcode.com/problemset/

  Python Data Analysis Libraries Syllabus (Week 9):

  Pandas: What is Pandas?, Installing Pandas, Importing Pandas, Pandas Data Structures (Series, DataFrame, Index)

  Working with DataFrames: Creating DataFrames, Accessing Data in DataFrames, Filtering and Selecting Data, Adding and Removing Columns, Merging and Joining DataFrames, Grouping and Aggregating Data, Pivot Tables

  Data Cleaning and Preparation: Handling Missing Values, Handling Duplicates, Data Formatting, Data Transformation, Data Normalization

  Data Visualization with Pandas: Line Plots, Bar Plots, Scatter Plots, Histograms, Box Plots, Heatmaps

  File Handling in Python: Reading and Writing Text Files, Reading and Writing Binary Files, Working with CSV Files, Working with JSON Files

Numpy: What is NumPy?, Installing NumPy, Importing NumPy, NumPy Arrays

NumPy Array Operations: Creating Arrays, Accessing Array Elements, Slicing and Indexing, Reshaping Arrays, Combining Arrays, Splitting Arrays, Arithmetic Operations, Broadcasting, Mathematical Functions, Statistical Functions, Linear Algebra Operations

Working with Data in NumPy: Reading and Writing Data with NumPy, Filtering and Sorting Data, Data Manipulation with NumPy, Window Functions

NumPy with Other Libraries: Matplotlib, Pandas

Complete below course of python data analysis using pandas, numpy, matplotlib (optional) and seaborn (optional) **(Week 9)**:

- https://www.youtube.com/watch?v=r-uOLxNrNk8&t=683s

Complete at least 3-4 case study from below playlists **(Week 10)**

- https://youtube.com/playlist?list=PL_1pt6K-CLoDMEbYy2PcZuITWEjqMfyoA

Python Project (Optional) - **(Week 10)**

- https://www.youtube.com/watch?v=iwUli5gIcU0

NOTE: As a beginner, choose either Power BI or Tableau. After getting into a job, you can switch tools as needed.

5. Power BI (□□□□ 11 to 12)

Tutorial Playlist (Week - 11):

https://youtube.com/playlist?list=PLmejDGrsgFyDMME3o2CamamZ8w9NxSWWo&si=w5hJyBq35bXOMt-v

End to End Dashboarding Project for understanding (Week - 12):

https://www.youtube.com/watch?v=mmxVCFceQgU

https://www.youtube.com/watch?v=pixlHHe_lNQ&list=PLUaB-1hjhk8H48Pj32z4GZgGWyylqv85f&index=11

NOTE: After completing this, if you have more time, you can work on as many projects as you like from youtube.

5. Tableau (□□□□ 11 to 12)

Tutorial Video (Week - 11):

https://www.youtube.com/watch?v=K3pXnbniUcM

End to End Dashboarding Projects for understanding (Week - 12):

https://www.youtube.com/watch?v=dahrmqT5GD4&t=4366s

https://www.youtube.com/watch?v=oAIubTqg-Kw (Part - 1)

https://www.youtube.com/watch?v=oTyCZVnNVZA (Part - 2)

NOTE: After completing this, if you have more time, you can work on as many projects as you like from youtube.

6. Projects (□□□□ 13 to 14):

NOTE: The projects mentioned below are end-to-end guided projects. After completing them, you can download any dataset from Kaggle and start experimenting on your own.

Power BI Dashboarding Projects :-

1. https://youtube.com/playlist?list=PLeo1K3hjS3uva8pk1FI3iK9kCOKQdz1I9&si=9AbP-H2sbnIiDTQO
2. https://www.youtube.com/watch?v=tT4V7zguCnc&list=PLeo1K3hjS3utcb9nKtanhcn8jd2E0Hp9b&index=27
3. https://www.youtube.com/watch?v=JC66t9eM10s&list=PLeo1K3hjS3utcb9nKtanhcn8jd2E0Hp9b&index=25

Project Using Web Scraping, Python, Pandas and Power BI:-

1. https://www.youtube.com/watch?v=4QkYy1wANXA&list=PLeo1K3hjS3utcb9nKtanhcn8jd2E0Hp9b

Project using SQL & Power BI:-

1. https://www.youtube.com/watch?v=V-s8c6jMRN0

Tableau Dashboarding Projects:

1. https://youtube.com/playlist?list=PLeo1K3hjS3usDI9XeUgjNZs6VnE0meBrL&si=Tq1iZ-sTeMuxFUOI
2. https://www.youtube.com/watch?v=UcGF09Awm4Y

End to End Data Analytics Project (Python + SQL)

1. https://www.youtube.com/watch?v=uL0-6kfiH3g

7. Pro Tips - Soft Skills in Data Analytics (Week 15):-

In data analytics, soft skills are as crucial as technical skills. They enable data analysts to bridge the gap between raw data and actionable insights, making them indispensable in decision-making processes.

1. Communication Skills:

- Why: Effectively conveying complex data insights to non-technical stakeholders.

- How to Improve: Write concise reports, engage in public speaking, and participate in group discussions.

2. Analytical Thinking:

- Why: To view data from multiple perspectives and draw meaningful conclusions.

- How to Improve: Practice critical thinking exercises and problem-solving scenarios.

3. Problem-Solving Skills:

- Why: To navigate ambiguous challenges and find innovative solutions.

- How to Improve: Tackle real-world data challenges and collaborate on projects.

4. Storytelling with Data:

- Why: To transform data into compelling narratives that drive action.

- How to Improve: Create data visualizations that tell a story, and practice presenting insights as narratives.

5. Business Understanding:

- Why: To align data insights with business goals and strategies.

- How to Improve: Stay updated with industry trends, and read business case studies.

Resources to Develop Soft Skills

- Blogs and Articles: Stay updated with platforms like Towards Data Science and LinkedIn Learning to enhance communication and business understanding.

- Podcasts and YouTube: Watch interviews and industry projects to see soft skills in action.

- Social Media Sharing: Share your learnings on LinkedIn to refine your communication and storytelling abilities.

Mastering these soft skills can significantly enhance your effectiveness as a data analyst, making you a more versatile and valuable asset to any organization.

ALL THE BEST !!