Foundations: Data, Data, Everywhere

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Abstract

Here you will find the notes that I've compiled on the first course of the Google Data Analytics Professional Certificate. There are 7 other courses in the sequence. It covers key data analytics topics, the ethics behind data analyitics, and the tools that data analysts use.

In short bullet points, here are the specific points these notes cover.

- Data Analysis Process
- Data Life Cycle
- Ethics behind Data and Upholding Fairness in your Analysis
- Tools of the Trade: Spreadsheets, SQL, RStudio, Tablaeu

Week 1: Introducing Data Analytics

Data Analysis Process

1. Ask
   How do we define the project that we would like to explore?
   How do I define success for this project?
   What outcomes would our leaders/managers like to see as a result of our analysis?
2. Prepare
   What would be an efficient timeline for this project?
   What data do we need to answer these questions?
   How can we gain access to this data?
   What are the best ways that we can present this data visually?
3. Process
   How will the data be collected, stored, managed, and protected?
   What steps are required to clean the data so that it is complete, correct, and relevant?
4. Analyze
   What insights does the data tell us? What can we discover?
   It is important to document your discovery, whether it be a positive one or a negative one.

5. Share
   What is the best way to VISUALIZE the results?
   How can we bring the data to life?
   What is the most effective way to communicate and share your report?

6. Act
   How can you work with leaders within the company to implement this change and see lasting results?

Week 2: Introducing Analytical Thinking

Exploring Core Analytical Skills

1. What is the root cause of the problem?
2. Ask yourself "why" something is occurring 5 times.
3. Where are the gaps in our process?
   Understanding where you are now, to get where you want to be in the future. Then you can analyze the gaps and figure out how to bridge them.
4. What have we not considered before?
   What information or procedures are missing from a process?

Week 3: Learning About Data Phases and Tools

Phases of the Data Life Cycle

1. Planning
   What kind of data do we need? Who will be responsible for the data? What are the optimal outcomeS?

2. Capturing the Data
   How do we collect the data? What outside resources do we have access to? How can we guarantee the safety of the data's integrity, credibility, and privacy?

3. Managing
   How and where will we store the data? What tools will we use to keep it safe and secure? What actions are taken to make sure that it's maintained properly?

4. Analysis
   How can we use the data to solve problems, make great decisions, and support business goals?

5. Archive
   How can we store the data in a place that is still available, but may not be accessed again?

6. Destroy
   What data erasure software can we use? Are there any physical data sources that need to be considered?

Phases of Data Analysis Process, Review

1. Ask
2. Prepare
3. Process
4. Analyze
5. Share
6. Act

Example of the Data Process

1. What is the problem that we're trying to solve? What are we hoping to learn?
2. What type of data do we need to figure this out? Quantatitive Data vs. Qualitative Data.
   Do we need to collect more data or do we already have the data?
3. How can we clean the data to understand it better? Learning about the potential of this data.
4. What UNBIASED patterns can we recognize from the data? What does the data tell us versus what do we want to see?
5. What is the landscape view that we want to convey?
6. All of this doesn't amount to much, if we can't implement what we've learned. How can we implement this at the organizational level AND the team level.

Exploring Data Analyst Tools

1. Spreadsheets
   Microsoft Excel and Google Sheets
   Functions and Formulas
2. Query Languages for Databases
   SQL, Structured Query Language
3. Visualization Tools
   Graphs, Maps, and Charts Tableau and Looker

Week 4: Setting Up a Data Toolbox

Learn About Sutrctured Query Language (SQL)

SQL is used to interact with large databases, it emphasizes larger data sets than a spreadsheet could handle.
Cheat Sheet for SQL

Data Visualization Tips

Line charts can track attributes over time
Maps can connect attributes to locations
Donut charts can show portions/percentages of attributes
Bar charts can compare two different attributes

Week 5: Introducing Data Analyst Career Posibilities

Where do Data Analysts work?

- Technology
- Marketing
- Finance
- Health care

Different types of Analysts

- Marketing Analyst: analyzes market conditions to assess the potential sales of products and services
- Financial Analyst: analyzes financial status by collecting, monitoring, and reviewing data
- Healthcare Analyst: analyzes medical data to improve the business aspect of hospitals and medical facilities
- Mental Health Analyst (?)

Best Practices for Interviews

- Keep your LinkedIn and GitHub updated
- Reach out to recruiters
- Prepare to investigate a business problem with a small sample size of data