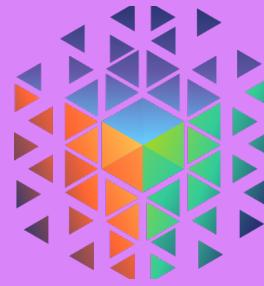


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I-Build and Optimize Data Warehouses with BigQuery: Challenge Lab

Imagine having the ability to not only gather vast amounts of data but also transform it into game-changing insights that shape the future of your business. That's the magic of Business Intelligence(BI)! It's like turning raw data into a treasure trove of actionable information that empowers you to make informed decisions with unwavering confidence. And in this lab, we're diving headfirst into the captivating world of BI, equipping you with the skills and tools you need to conquer it all.

BI is fueled by cutting-edge technologies, tools, and methodologies that extract, transform, and load data, sculpting it into meaningful data models that breathe life into your insights. It's a journey of unraveling the hidden secrets buried within your data and presenting them in a way that not only informs but also dazzles the eye.

As a Business Intelligence or Data Analyst Engineer, let's take a moment to delve into the exciting world of challenge labs and explore how we can amplify the impact of Lab #1. By combining the invaluable results we've obtained through our BQ (BigQuery) journey with our expertise, we have the power to create insightful and engaging reports using cutting-edge tools like Looker Studio or Tableau. These tools seamlessly integrate with BigQuery, enabling us to effectively communicate and share our findings.

Imagine the possibilities that await us! Lab #1 has laid a solid foundation, but now it's time to take it to the next level. We can transform our raw data into visually captivating reports that go beyond mere numbers and statistics. With Looker Studio or Tableau, we unleash our creativity to craft reports that not only inform but also inspire meaningful discussions.

These reports become our gateway to unlocking a world of insights. By leveraging the robust capabilities of Looker Studio or Tableau, we can bring our data to life through interactive visualizations, dynamic dashboards, and compelling storytelling. We have the opportunity to showcase trends, patterns, and correlations in a visually stunning and intuitive manner.

But the magic doesn't stop there. By integrating Looker Studio or Tableau with BigQuery, we open up a whole new realm of possibilities. The seamless connection between these tools and our powerful data models and queries enables us to effortlessly combine the strength of data analysis with the artistry of visual representation. This integration empowers us to communicate our findings effectively, ensuring that stakeholders not only understand the insights but also actively engage with them.

II-Engineer Data in Google Cloud: Challenge Lab

The "Engineer Data in Google Cloud: Challenge Lab" showcases the integration of Artificial Intelligence (AI) to revolutionize data engineering. AI automates data transformation, enhances data cleaning and quality assurance, and enables seamless data integration. Moreover, AI-driven predictive modeling empowers data engineers to make accurate predictions and informed decisions. By leveraging AI, this lab demonstrates how data engineering processes can be optimized, data quality can be improved, and valuable insights can be extracted for intelligent decision-making.

In the "Engineer Data in Google Cloud: Challenge Lab," we embark on an exciting journey from an ML Engineer's perspective, exploring advanced models and powerful techniques beyond basic linear regression.

As ML Engineers, we have the opportunity to delve into more sophisticated models like :

-Deep Neural Networks (DNN):

Which is designed to recognize patterns and make predictions based on input data. It consists of multiple layers of interconnected nodes, called neurons, that process and transform the data. in which a neuron takes inputs, performs calculations, and produces an output.

-Convolution Neural Networks (CNN):

Which consists of multiple layers that learn to identify patterns and features within the data.its key component is the convolutional layer, which applies filters to the input data, extracting important features.

-Recurrent Neural Networks (RNNs):

Which is designed to process sequential data, like time series or text. It can understand the order and relationships between the elements in a sequence.

The main feature of an RNN is its ability to retain information from previous steps and use it to make predictions at each new step.

These models are designed to uncover intricate patterns and capture complex relationships within our data, enabling us to make more accurate and insightful predictions.

But that's not all! We can also leverage powerful techniques to optimize our models. Hyperparameter tuning allows us to fine-tune the settings of our models, optimizing parameters like learning rate, batch size, and hidden layers to achieve optimal performance. Grid Search systematically explores different combinations of hyperparameters to find the best configuration, while Gradient-Based Optimization adjusts weights and biases based on gradients to improve accuracy.

"Inspire. Explore. Create. This paper is a testament to the limitless potential of human imagination and the power of knowledge. As we conclude this visual journey, may it serve as a catalyst for your own personal growth and inspire you to embrace curiosity and innovation in all areas of life not just the challenge labs ;). Let its vibrant color be a reminder that there are no boundaries to what you can achieve. Take this inspiration with you as you continue your own unique path of discovery. Dare to dream, dare to learn, and dare to make a difference. The possibilities are endless."

Thank you , I really appreciate the time you took to read this paper.

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Rimas Alshehri