

Final Report

Gia Bao Hoang – a1814824

I. Company Introduction

ElectraNet Pty Ltd is a leading electricity transmission company that operates in South Australia. Established in 1999, the company has played a crucial role in ensuring a reliable and secure electricity supply to consumers in the state. ElectraNet's core business is to manage and operate the high voltage electricity transmission network that connects power generators to distribution networks, which ultimately supply electricity to homes and businesses.

The company's philosophy centers on the provision of safe, reliable, and affordable electricity supply while being mindful of the environmental and social impacts of its operations. ElectraNet works on power people's live, connect people and create a better future, using energy and infrastructure solutions, ElectraNet is committed to investing in innovative solutions that support the transition to a low-carbon energy future. As a responsible corporate citizen, the company is actively involved in community engagement and supports various initiatives that promote sustainable development.

II. What did I do?

During my tenure as an intern at ElectraNet Pty Ltd, I was tasked with a demanding project that involved researching and developing feasible methods for imputing missing weather data. This assignment demanded a keen understanding and proficient use of SQL and Python. By employing SQL, I was able to successfully extract relevant data from the database, familiarizing myself with the data flow process especially as it pertained to the integration of weather data into the server. However, the bulk of my work was centred around Python, and this was where I truly honed my programming skills.

As a key component of this project, I carried out an exploratory data analysis of weather readings from a variety of stations, concentrating on temperature, wind speed, and wind direction. Leveraging insights drawn from this analysis, I formulated, instituted, tested, and juxtaposed numerous imputation methods with the pre-existing one, thereby pinpointing the most efficient approach to handling missing weather data. Through this rigorous exercise, I sharpened my capabilities in data analysis and Python programming.

Moreover, as the project progressed, I discerned potential expansions to the project's scope and presented these to my supervisor. This proactive approach led to the enlargement of the project's spectrum, enabling us to incorporate extra data quality control checks predicated on my analysis. I categorized and ranked different scenarios, activating appropriate alerts for

maintenance during instances of station malfunctions using Python. This extra responsibility offered me a deeper comprehension of data quality and its significant influence on forecast accuracy - a crucial element for the operational success of ElectraNet.

The undertaking was in alignment with my initial expectations. However, my drive to challenge myself and resolve potential issues led to the proposal of expanding the project's scope. This demonstrated my commitment to contributing beyond the minimum requirements.

In summary, this project served as an invaluable experiential learning opportunity that allowed me to expand my skills in data analysis, SQL, and Python programming. Furthermore, it granted me an insight into the intricate workings of a preeminent electricity transmission company and the critical role data accuracy plays within the industry. My contributions during this internship aided in ElectraNet's ongoing efforts to enhance their services and make a positive impact on the community they serve.

III. What did I learn?

During my internship, I found myself actively leveraging the skills and knowledge garnered from numerous courses I had undertaken. Crucially, my understanding of statistical modelling became instrumental in deciphering, analysing, and interpreting complex data sets. This proficiency was on display as I performed exploratory data analysis on weather data, which encompassed temperature, wind speed, and wind direction from a range of stations. With my grounding in statistical modelling, I could discern patterns and trends that served as a reliable basis for predicting missing weather data. Moreover, I applied my statistical acumen to critically evaluate the effectiveness of multiple imputation methods for missing weather data, culminating in the development of a significantly improved imputation method.

Furthermore, insights from my Introduction to Software Engineering course equipped me with the fundamentals of operating within a professional setting. These insights spanned from understanding development processes and principles to effectively liaising with stakeholders in my capacity as a software-centric professional. My grasp of concepts such as version control, code organization, and testing allowed me to efficiently develop and structure my code. My commitment to ensuring my code was not only readable and maintainable but also comprehensively documented underscored my dedication to best practice. Concurrently, I implemented rigorous testing procedures to guarantee the correct and efficient functioning of my code.

In parallel, my expertise in Object-Oriented Programming was invaluable in enabling me to write robust and effective Python code. This course had introduced me to key object-oriented programming concepts such as inheritance, encapsulation, and polymorphism.

These principles allowed me to create modular, reusable code that was easily extendable, a critical aspect of building complex software systems. The course also underscored the significance of good code design, teaching me to use design patterns and architectural principles effectively.

In terms of interpersonal skills, the communication abilities I had honed during group projects at the university were essential in my role at the internship. These experiences equipped me to engage constructively as a member of my team, contributing effectively to collaborative efforts.

To sum up, the knowledge and skills I had accrued from my academic courses proved to be remarkably relevant and beneficial during my internship project. By drawing upon my understanding of statistical modelling, software engineering principles, and object-oriented programming, I was able to execute the project in an efficient and effective manner. This real-world experience not only honed my existing abilities but also provided an invaluable opportunity to apply my knowledge to practical scenarios. I am confident that this experience will bear fruit in my future pursuits.

IV. Advice for Other Interns

As someone who has completed an internship, I would highly recommend taking the initiative and doing your best on every task given to you. This shows your employer that you are eager to learn and contribute to the company. Additionally, don't be afraid to ask for help or clarification if needed. Remember, you are there to learn and grow, and your supervisor and colleagues are there to support you.

Before starting an internship, it can be useful to brush up on relevant skills and knowledge. This could involve taking relevant courses, practicing coding, or reading up on the industry and the company you will be interning for. By doing so, you will be better prepared to handle the tasks and responsibilities given to you during your internship.

When looking for an internship, it is important to consider your goals and interests. Look for internships that align with your career aspirations and provide opportunities to learn and develop new skills. Research the company and its values, culture, and history to ensure that it is a good fit for you. Furthermore, communicate with your supervisor early on to establish expectations and clarify any concerns you may have. This will help you make the most of your internship and ensure that you are meeting your goals and objectives.