BLOSSOM ACADEMY

Program Modules

Major: *Data Analytics & Machine Learning*

Module 1

Weeks 1-5
Data Analytics: Understanding Customers

In the first project, you work as a **data analyst** for an aerospace company. Your mission is to use data mining and machine-learning techniques to investigate patterns in the company's bookings data and provide insight into **customer buying trends** and preferences. The conclusions drawn from the **patterns in the data** will help the business make **data-driven decisions** about sales and marketing activities and understand the relationship between **customer demographics** and **purchasing behavior**. All this will be achieved using RapidMiner, a powerful Data Mining tool.

You will collect your **insights into a presentation** that must make a convincing argument for adopting your recommendations, and then deliver it in front of your fellow students, the mentors and the **Data Analytics Program Owner** playing the role of the client's CEO.

Module 2

Weeks 6-10
Predicting Profitability and Customer Preferences

Continuing in your role as a data analyst at the aerospace company, your new job is to extend the company's application of **data mining methods** to **develop predictive models.**

The company's engineering team is considering safety measures to their current operations. You will use the **R statistical programming language** augmented with machine **learning packages** to develop various risk management models and strategies to prevent future passengers from facing the negative impact of catastrophes. Next, you will **create a model** to forecast weather patterns, plan fuel loans, and make necessary changes to the flights before delays occur. As in Module 1, this project concludes with your **presentation to management**, explaining your **insights** and **suggestions** for **data mining process improvements.**

Module 3

Weeks 11-16
Deep Analytics and Data Visualization

Increasingly, technology companies across Africa are applying data analytics techniques to the masses of data generated by devices such as **smartphones**– the "FinTechs," "'mCommerce," "Logistics" etc. The ability to deal with data of these types will prove to be a high-demand skill for data analysts.

In Module 3 you work for a high-growth technology **start-up** that wants to use Data Analytics to **solve two difficult problems,** depending on the industry. Examples include:

- **Fintech**: Using predictive analytics to conduct a risk analysis of potential borrowers and improve the credit score of borrowers.
- **mCommerce**: Monitoring market trends and creating spending profiles based on transaction data.

You will use **R**, and its libraries **dplyr** and **ggplot**, to **perform visualizations**, then to generate descriptive statistics and predictive models using time series regression techniques and statistical classifiers. You will **present your results** to the start-up's **management**, explaining the **strengths and weaknesses** of the **approaches** that were implemented and making suggestions for further improvement.

Module 4

Weeks 17-19
Big Data & Web Mining

You will learn the **algorithmic and organizational** skills required to scale data analysis to **large server farms**, **computing clouds**, and **the web**, including an understanding of the design and implementation differences between **single-computer** and **cloud-scale programs**, analytics, and **data processing**. You will also gain a deep knowledge of predictive data analysis, ranging from discovering patterns and correlations in data to making predictions and estimating their accuracy.

As part of this process, you will **master fundamentals of scaling up data analysis** to a large cloud **computing platform (AWS EC2)** where you will become proficient in working with **map-reduce-based systems** and leveraging the computing power of the cloud to prepare very large data sets for **deep analysis**, as well as learn how to train and apply **modern machine learning algorithms** to **large processed datasets**. You will also learn how to identify the types of business questions for which **Big Data** analyses can provide significant insights in support of business decision-making.

Module 5

Weeks 20-23
Final Project

In the final module, you will apply what you've learned in the first four modules to **design and execute your own project**. Typically there are three projects types our students choose:

- A project that allows them to **further apply and reinforce the skills** they've learned in the program
- A project that **forces them to learn something entirely new**; most often this involves some use of the coding language **Python**
- **Partner** with a **local company** on an **actual business analysis**. This often serves as a test for future employment with the partner company.