

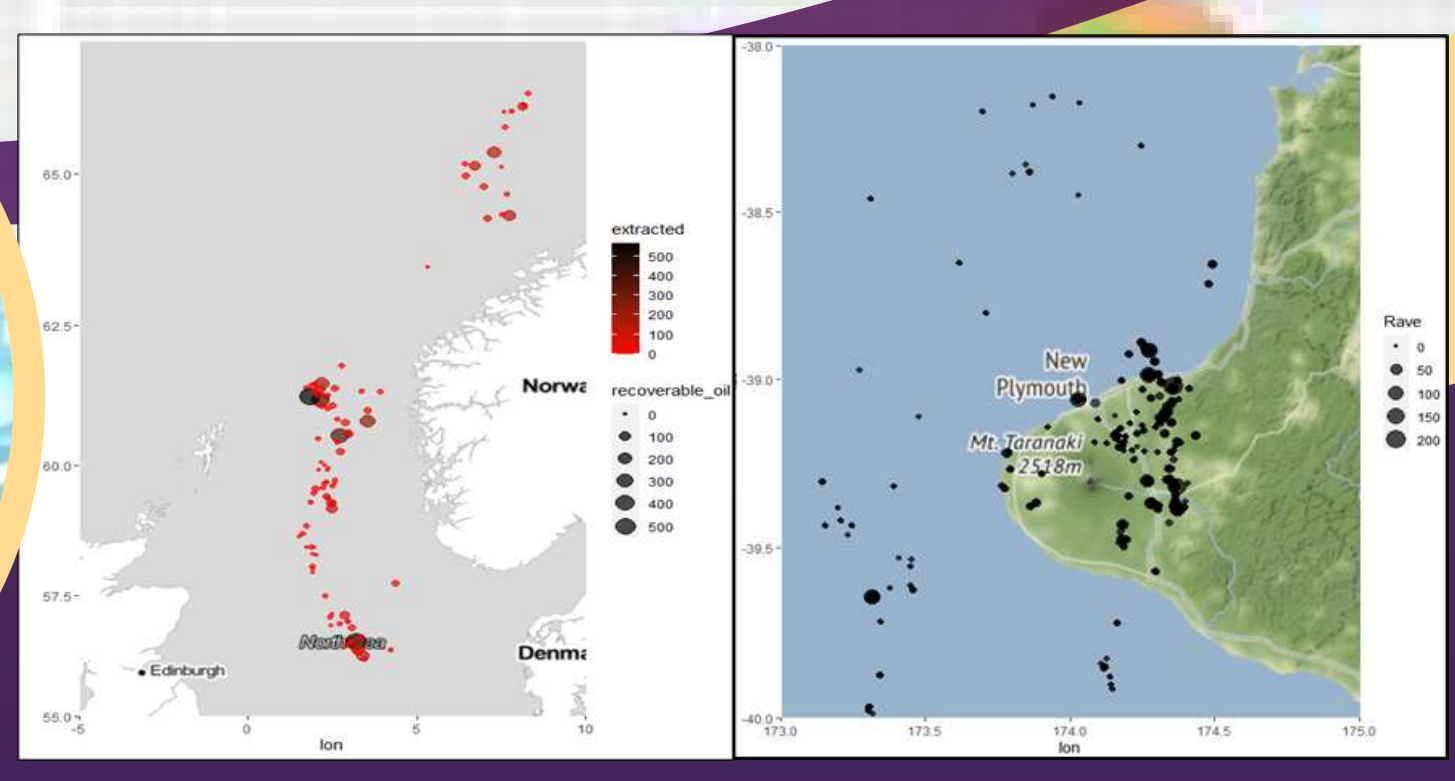
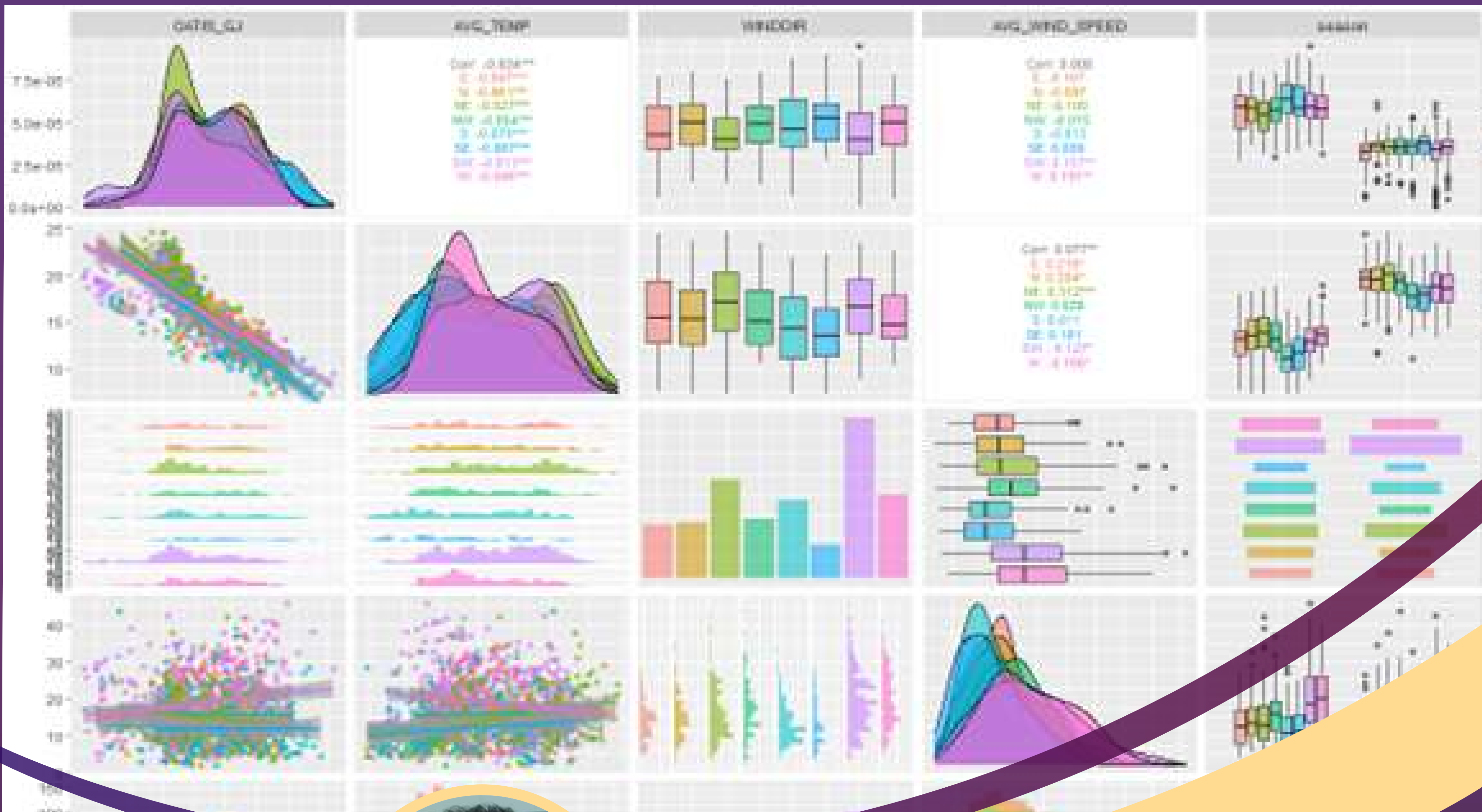


PEA

PETROLEUM ENGINEERS ASSOCIATION



20+ HOURS OF PRACTICAL TRAINING ON DATA SCIENCE APPLICATION IN REGIONAL OIL AND GAS FIELDS STUDY (WITH R AND SQL)



DR. MEHDI TADAYONI (ENERGY ANALYST)



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COURSE OBJECTIVE:

This course tries to provide comprehensive ANALYTICS knowledge to analyze reservoirs/field data by combining R and SQL.

One of the outstanding features of this course that highlights it from other similar courses is building up your confidence from scratch; by carrying out all analytics steps in R and gaining insight from your field and nearby fields by mixing all available data in R and efficient database in SQL.

This course teaches you how to apply the Data Science approach to conduct integrated research in a localized oil-rich area (50 oil and gas fields with 7 million records), which is known as Macro analysis, and well log/core analysis, which is known as Microanalysis.

You will learn how to be an efficient team member in the management of oil-rich regions in national/consultant/private companies to specialists in the upstream section by applying analytics tools (R & SQL) to reduce uncertainty and step-up efficiency.

Another distinctive feature of this course is the use of free technologies to assess large-scale oil and gas data and offer fresh ways to lower reservoir management uncertainty.

COURSE PRE-REQUISITES:

Participants should have upstream domain knowledge. Prior programming experience or experience in geoscience can be helpful but it is not essential.



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COURSE OBJECTIVES

YOU WILL LEARN:

- Different concepts in oil and gas reservoir engineering / characterization
- The important concepts in petrophysics
- Working with various sources of data such as CSV, Excel, text, LAS, database, and website.
- Working with core, composite log, pressure, geological data, production data,
- Manipulating big data including 35 fields, 85 wells, and 7 million records.
- R basic
- Entire Data Science workflow from data preparation to preparing and publishing data on the website
- Fundamental Data Engineering, Data Analysis, and Data Mining
- Fundamental of Linear regression (Machine learning) to predict reservoir properties
- Introduction of database and programming in (SQLite/Oracle)
- Preparing advanced visualization which is proper for upstream specialists
- Learning how to manage oil-rich areas effectively by analyzing Macro (multi-fields) to Micro (core data) source of data
- Learning how to prepare the live report in R Markdown and publish it.



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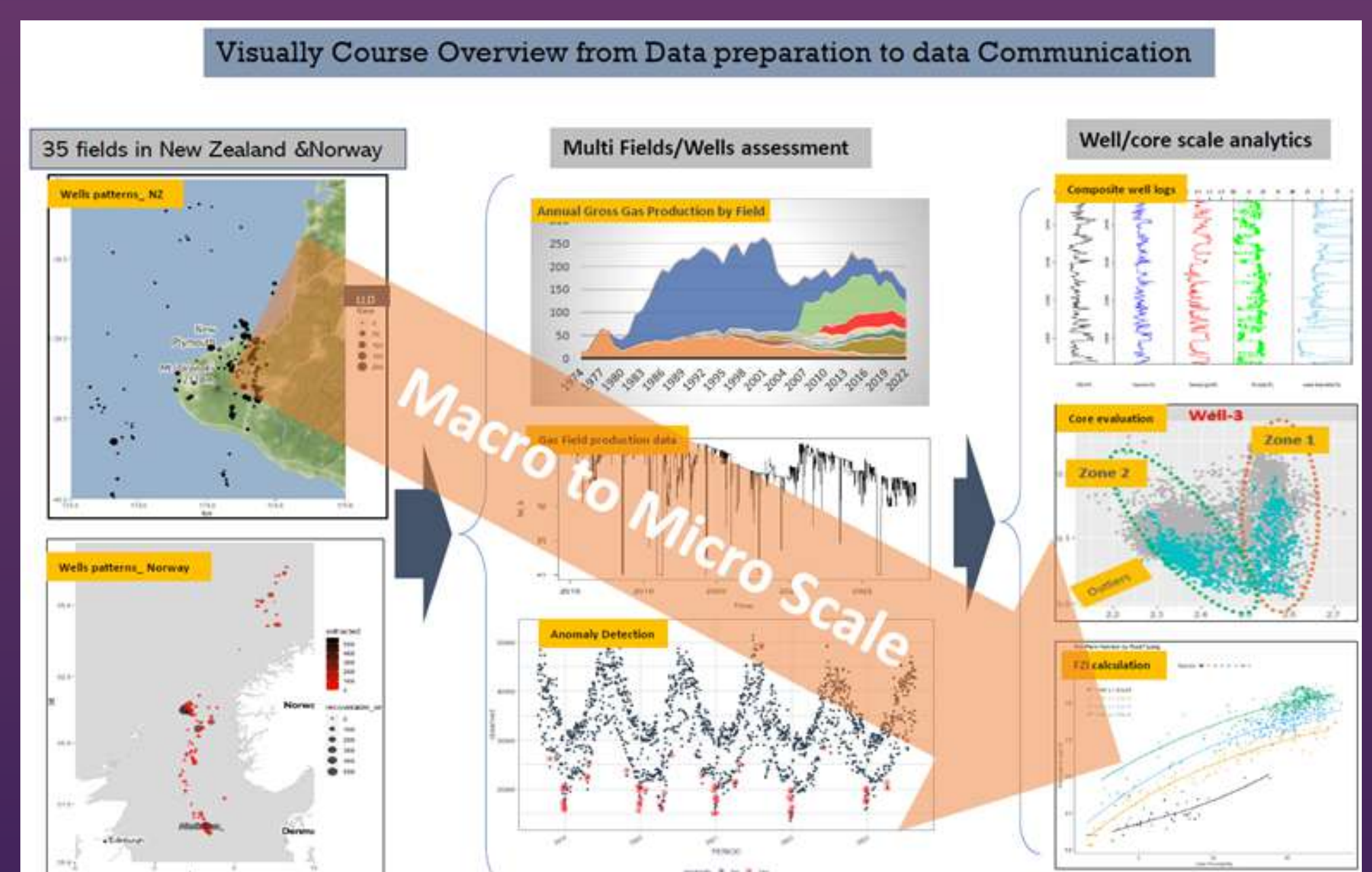
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MODULE 1- INTRODUCTION

- Introduction important aspects of reservoir characterization and all data
- Introducing industrial datasets from different fields such as well log data, core data, pressure data, production, drilling, and pore pressure....
- Introduction of data science approach in data analytics from scratch
- Introduction R programming
- Introduction of SQL role in database management
- Brief introduction of RStudio
- Brief introduction of various R Packages
- Introduction of different applications of data analytics in upstream
- Introduction of data analytics steps by R



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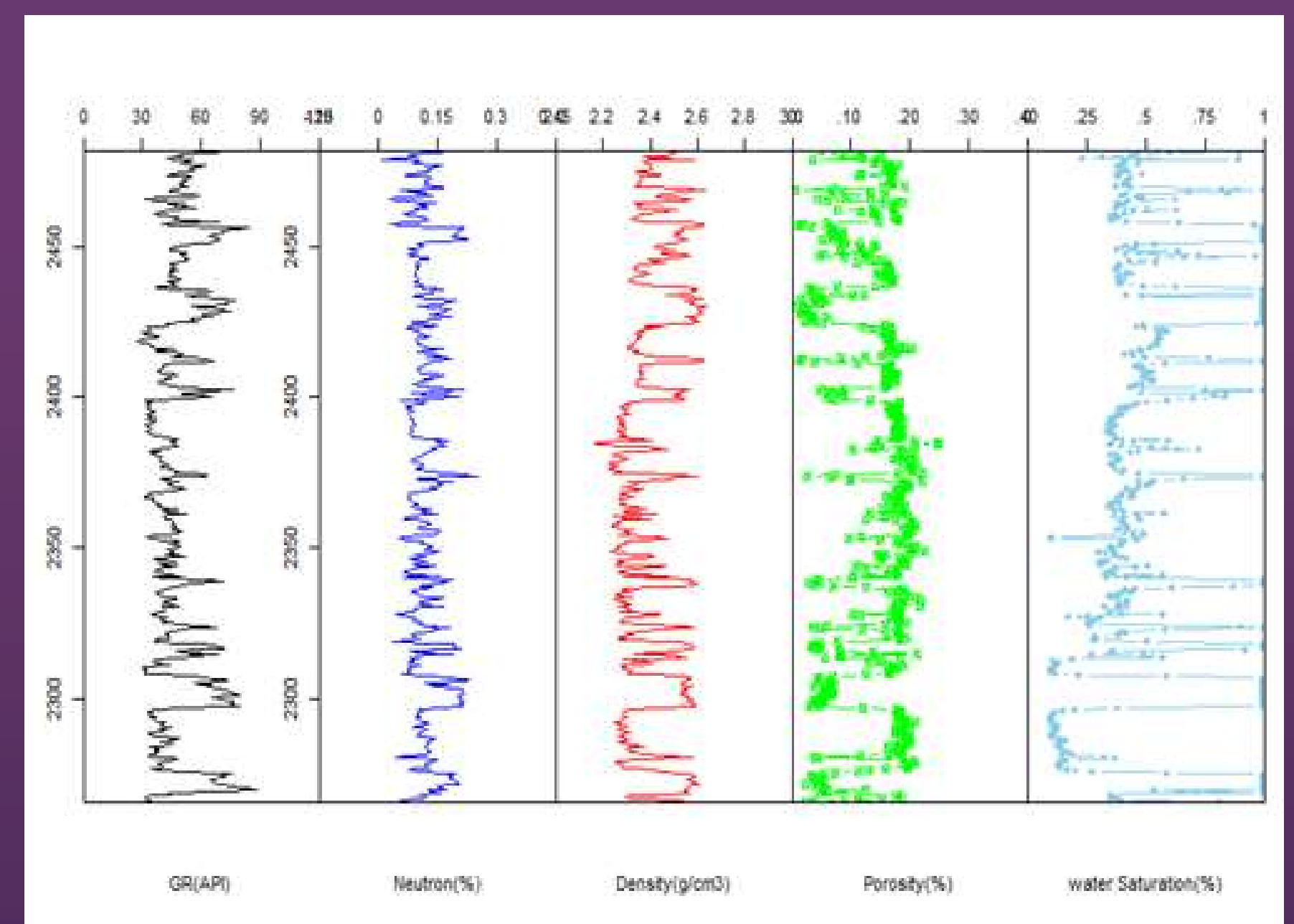
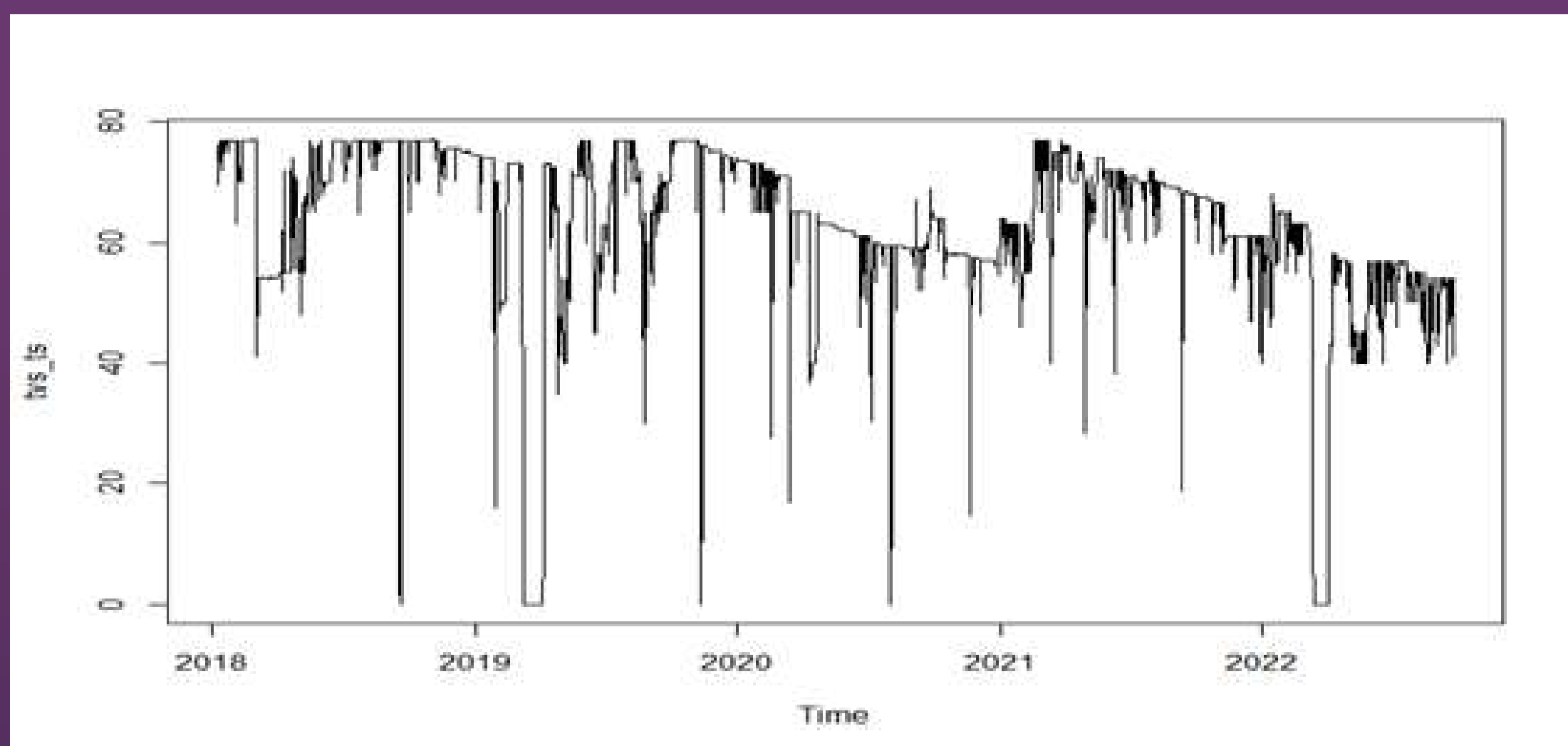
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MODULE 2- DATA ANALYTICS

- Data importing, data appending, data transforming, handling missing data
- Data Wrangling such as wells data Joining, Combining, and Reshaping
- Well-log data Aggregation and Group Operations
- Confidently use R to solve different reservoir parameters such as porosity, water saturation evaluation in sandstone and carbonate reservoirs, different approaches in shale evaluation, logs relationship, and representing various cross-plot
- Easily create high-quality visualization of different well data
- Visualizations I



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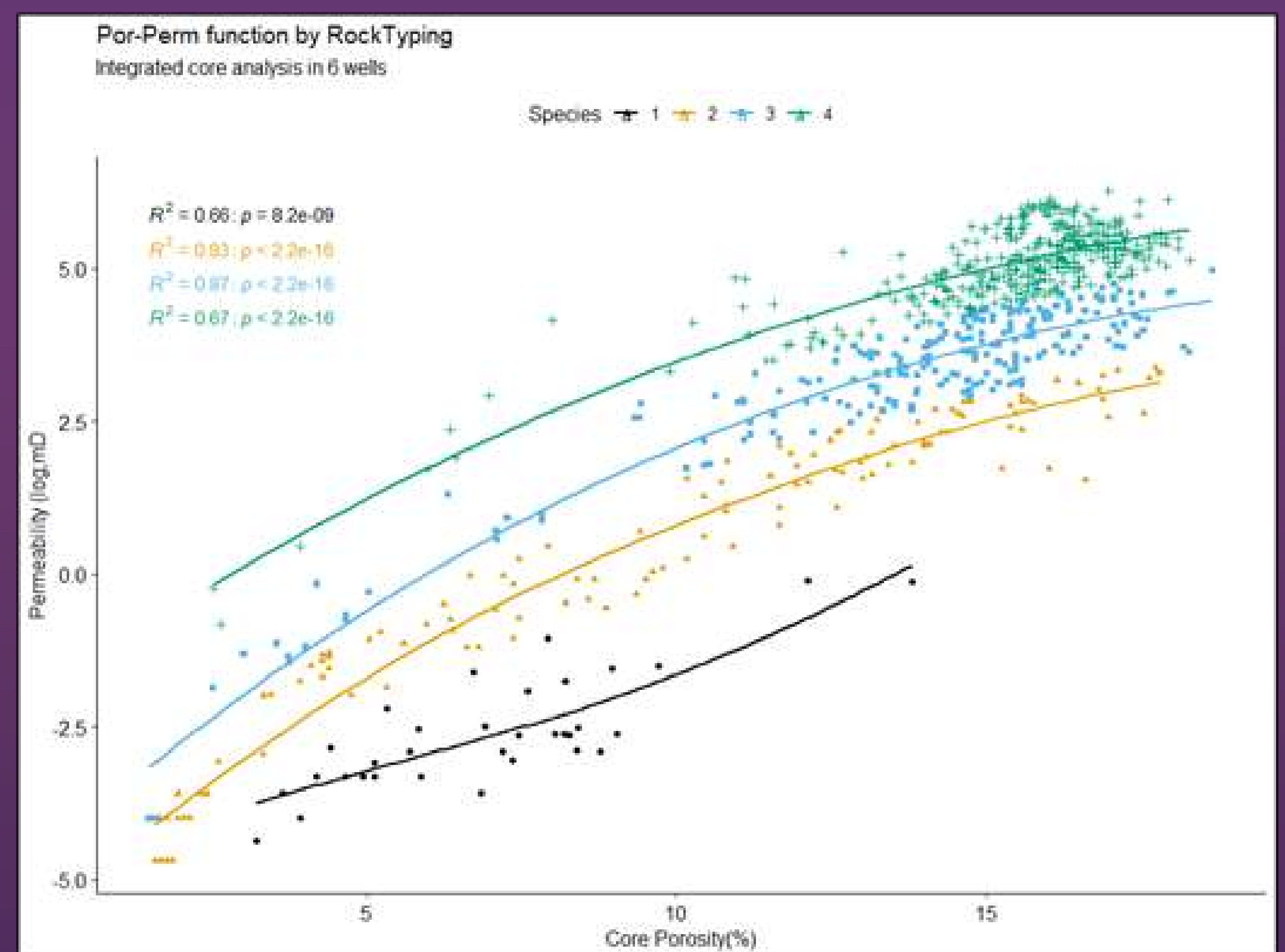
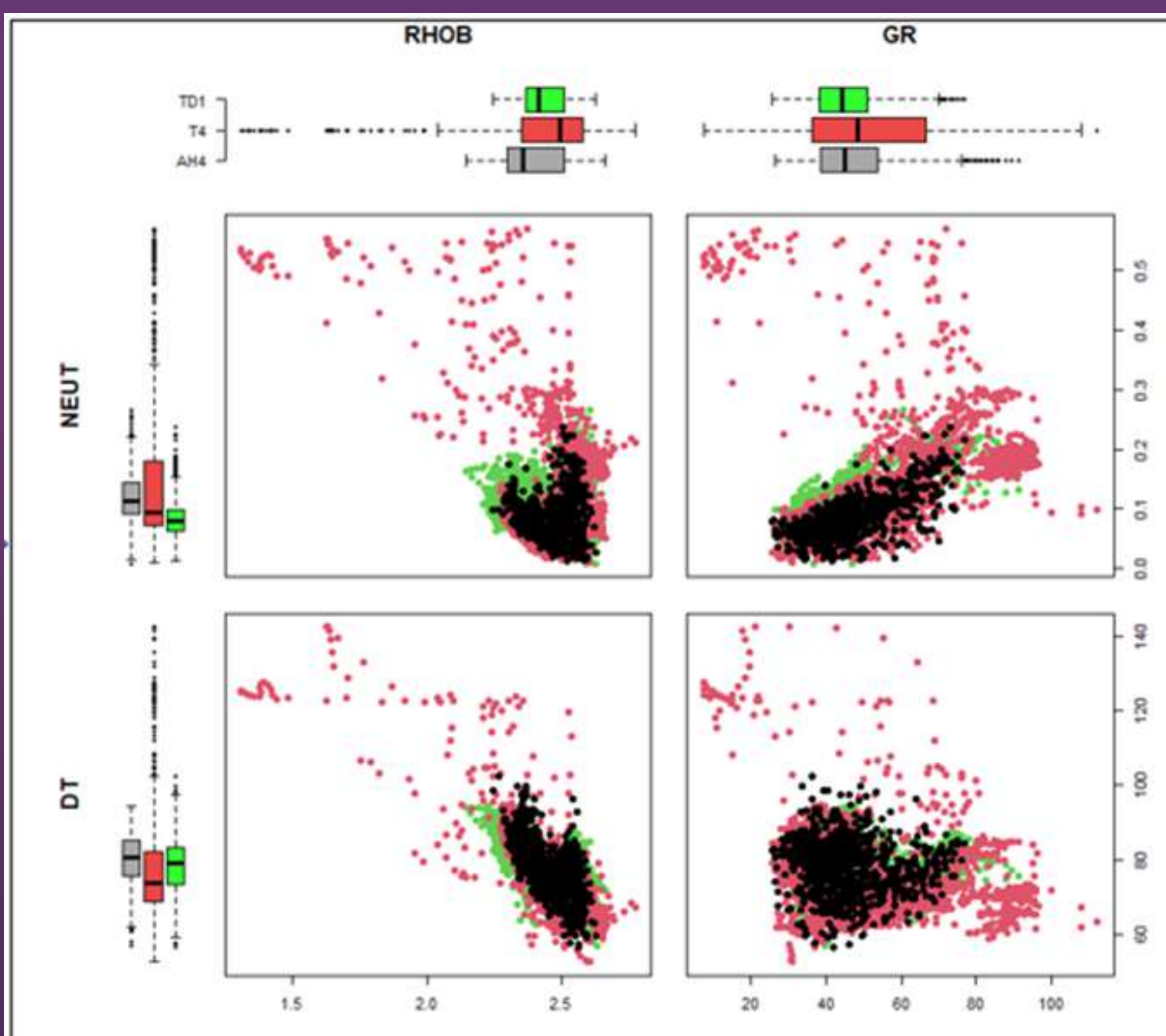
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MODULE 3- DATABASE COMPUTATION

- Preparation of field data management by SQL
- Database organization, SELECT, TABLES, FILTERING, JOINING, AGGREGATION... with well-log data by SQL
- Well-log data Aggregation and Group Operations
- Connecting R and SQL to extract useful data from the database
- Core Analytics (FZI investigation in multi-wells)
- Advanced Visualizations II



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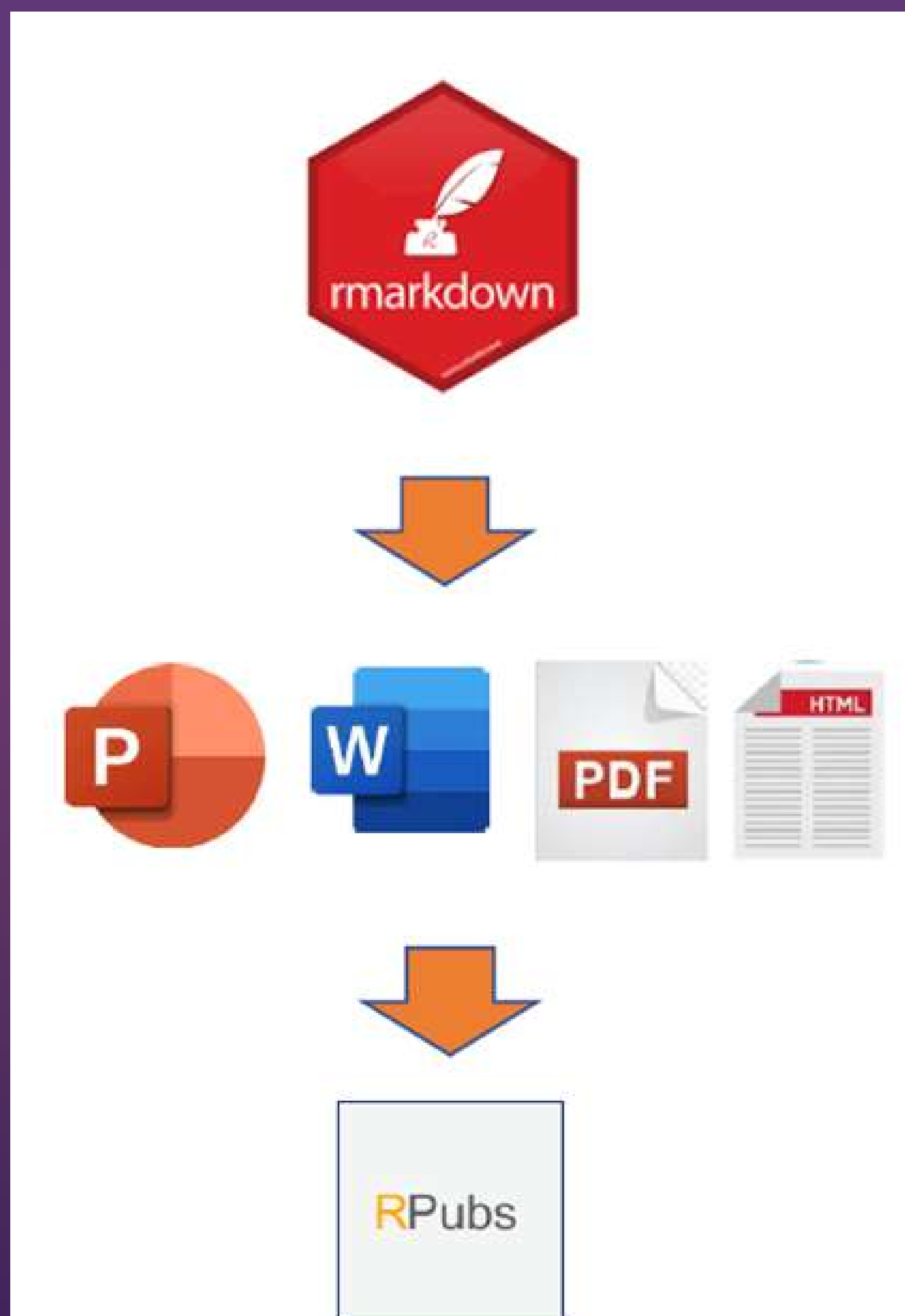
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MODULE 4- REPORT/DASHBOARD PUBLISHING

- Web scrapping to import live data from a website to R and Store in the Database
- Preparing informative dashboard from well data analysis in R Markdown
- Publishing report/dashboard on the internet



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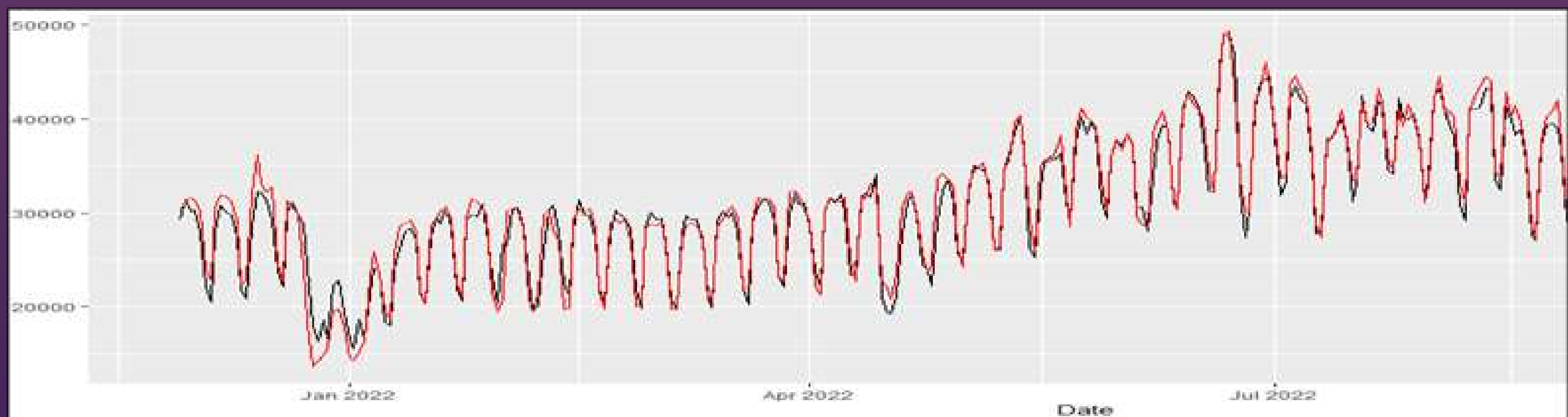
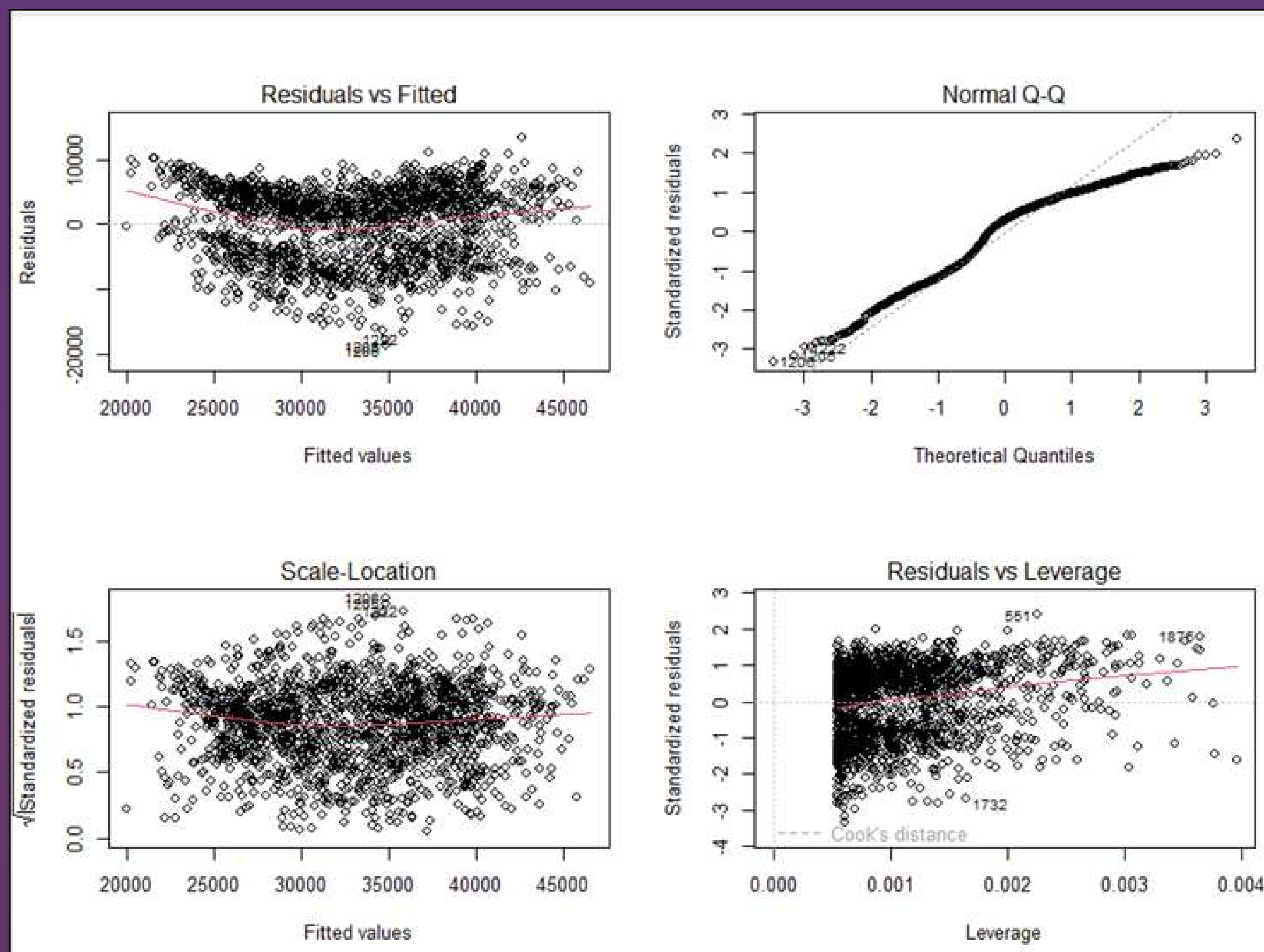
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MODULE 5- FUNDAMENTALS OF MACHINE LEARNING

- Introduction of Machine Learning approaches in the oil and gas industry
- Preparing raw data to use in ML algorithm (Regression method)
- Run the actual ML Stream from scratch (Regression method)
- How to evaluate and select the best ML approach



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