Portofolio

MUHAMMAD NASHIRUDDIN AL BANI

Data Enthusiast

mnashiruddin.albani23@gmail.com

linkedin.com/in/mhmd-al-bani

ABOUT ME

Muhammad Nashiruddin Al Bani

My name is Muhammad Nashiruddin Al Bani. I am a fresh graduated from Yogyakarta State University with a Bachelor's degree in Statistics. During my time as a student, I was actively involved in various organizations and projects, including the Student Executive Board and community-based initiatives in Yogyakarta. I also took part in several competitions. I have a strong interest in research, statistical consulting, data analysis, and mathematics.

mnashiruddin.albani23@gmail.com

Education

2021 - 2025

Yogyakarta State University

Statistics Study Program
GPA 3.70/4.00

August 2024

PwC Switzerland Power BI Job Simulation on Forage

mnashiruddin.albani23@gmail.com

Skills & Tools

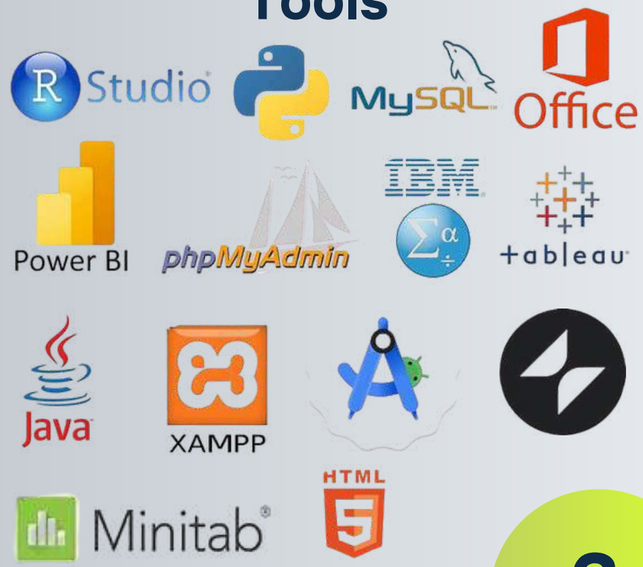
Technical Skills

- Data Analyst
- Data Scientist
- Data Processing
- Data Mining
- Artificial Intelligence
- Machine Learning
- Database

Soft Skills

- Communication
- Problem-Solving
- Lobbying
- Management
- Project Planning
- Team Work
- Leadership
- Public Relations

Tools



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Professional Experience 1

Dinas Kesehatan Kota Yogyakarta

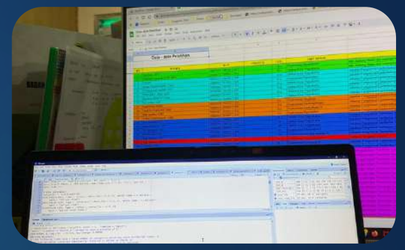
July - August 2023

- Internship

Section for Prevention and Control of Non-Communicable Diseases and Mental Health

My duties include collecting and analyzing data related to non-communicable diseases and mental health, solving problems through data collection and analysis in various programs (including integrated coaching posts), and providing insights, recommendations, and suggestions on sustainability policies and strategies in health services and collaborating institutions in Yogyakarta.

- Internship



Pharmaceutical Section of Medical Devices and Food and Beverages

My duties include collecting and analyzing data related to the pharmaceutical, medical devices, and food and beverage sectors, resolving issues related to sampling of incoming and outgoing medical devices, conducting sampling at the Integrated Pharmaceutical and Medical Devices Service Unit Warehouse, and providing input, recommendations, and suggestions related to sustainability policies and strategies in the health services sector and collaborating institutions in the City of Yogyakarta.

- Internship

Health Human Resources Section

My job is to collect and analyze data related to health human resources, including pre-test and post-test data for employees and business premises applying for permits, evaluate, interpret, and present quantitative data, and provide input, recommendations, and suggestions on sustainability policies and strategies in health services and collaborating institutions in the City of Yogyakarta.

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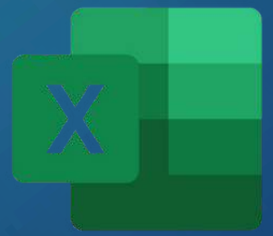
Professional Experience 1

Dinas Kesehatan Kota Yogyakarta

July - August 2023

- **Tools**


- **Skills**

1. Data Entry
2. Data Analyst
3. Data Visualization
4. Document Review

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Project 1

Dinas Kesehatan Kota Yogyakarta

APPLICATION OF ALGORITHM IN DRUG NEEDS ANALYSIS USING K-MEANS CLUSTERING IN THE YOGYAKARTA CITY HEALTH SERVICE

Project Overview :

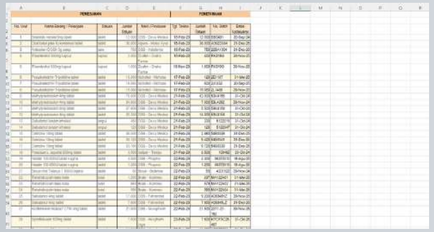
This project aims to analyze and cluster data using the K-Means method to identify patterns within the dataset. By leveraging data analytics technology, this project helps in grouping data based on similar characteristics, making it useful for more effective decision making.

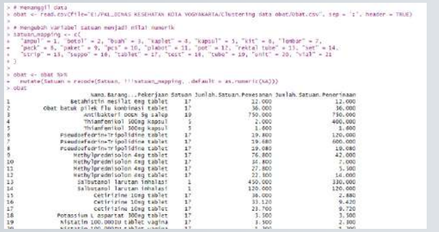
Technology & Tools :

- Programming Language: R
- Data Processing: RStudio
- Visualization: ggplot2, base R plotting
- Machine Learning & Statistical Methods: K-Means Clustering

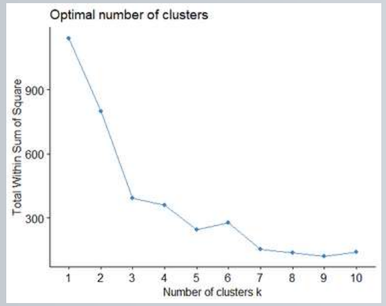
Model & Architecture

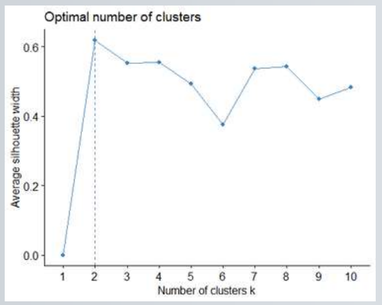
- Machine Learning Model: K-Means Clustering for data segmentation.
- Feature Engineering: Data preparation, descriptive analysis, determining the optimal number of clusters using the Elbow Method, initial cluster centroid analysis, centroid updating, object clustering, and model evaluation using validation metrics.

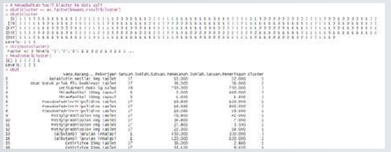


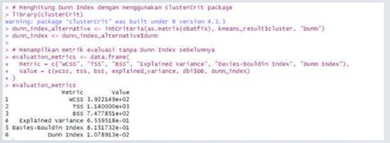


```
> # Menormalisasi data
> obatfix <- scale(obat[,2:4])
>
> # Menghitung jarak Euclidean
> dataeuc <- get_dist(obatfix)
>
> # Metode elbow untuk menentukan jumlah cluster optimal
> fviz_nbclust(obatfix, kmeans, method = "wss")
>
> # Metode silhouette untuk menentukan jumlah cluster optimal
> fviz_nbclust(obatfix, kmeans, method = "silhouette")
```









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Project2

Data Mining for Statistics

Customer Segmentation Analysis for Credit Card Holders Using Hierarchical Clustering

Project Overview :

This project aimed to group 8,651 active credit card holders (over 6 months) into meaningful customer segments using Hierarchical Clustering (Ward's Method). The dataset contained 18 behavioral variables, such as purchase frequency, one-off purchases, installment purchases, cash advances, credit limit, and payments.

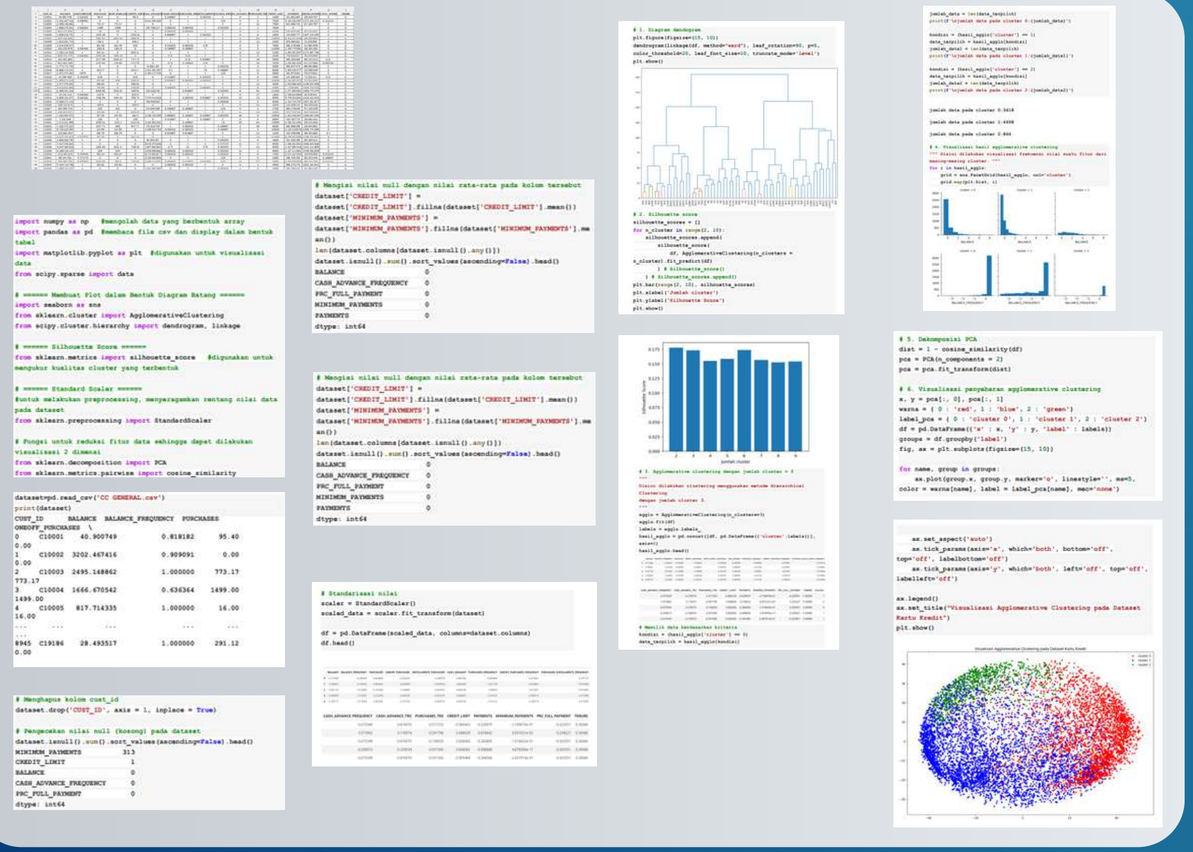
The objective was to identify spending patterns and segment customers to support targeted marketing strategies for financial institutions.

Technology & Tools :

- Programming Language: Python
- Libraries: Pandas, NumPy, Matplotlib, Seaborn, Scikit-learn
- Methods: Hierarchical Clustering (Ward's Method), PCA, Silhouette Score

Model & Architecture

- Preprocessing: Missing value imputation, feature scaling
- Best Cluster Number: 3 (evaluated with Silhouette Score)
- Cluster Insights:
- Cluster 0: High balance & high spending customers (potential premium targets)
- Cluster 1: Low balance & low spending (dormant users)
- Cluster 2: Medium balance & medium spending (average customers)
- Visualization: Dendrogram, PCA-based scatter plots



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Project3

Digital Image Processing

Implementation of Vehicle License Plate Recognition using OpenCV and OCR in Automated Parking System

Project Overview :

Developed an automatic parking system with license plate detection & recognition. Combined OpenCV (image processing) and EasyOCR (text extraction). Tested on 15 real images → 83.85% accuracy.

Technology & Tools :

- Programming: Python
- Libraries: OpenCV, EasyOCR, NumPy, Matplotlib
- Methods: Image Processing, Segmentation, Optical Character Recognition

Model & Architecture

- Computer Vision Model: OpenCV for image preprocessing, plate detection, and segmentation.
- Text Recognition Model: EasyOCR for extracting alphanumeric characters from detected license plates.
- Feature Engineering: Image preprocessing (grayscale conversion, resizing, noise reduction, edge detection), plate localization using contour detection, character segmentation, and text conversion into ASCII.
- Evaluation: Accuracy measurement by comparing detected plate numbers against ground truth labels, with an overall accuracy of 83.85%.

```python
import cv2

harcascade = "model/haarcascade_russian_plate_number.xml"

cap = cv2.VideoCapture(0)

cap.set(3, 640) # width
cap.set(4, 480) #height

min_area = 500
count = 0

while True:
    success, img = cap.read()

    plate_cascade = cv2.CascadeClassifier(harcascade)
    img_gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

    plates = plate_cascade.detectMultiScale(img_gray, 1.1, 4)

    for (x,y,w,h) in plates:
        area = w * h

        if area > min_area:
            cv2.rectangle(img, (x,y), (x+w, y+h), (0,255,0), 2)
            cv2.putText(img, "Nomor Plat", (x,y-5), cv2.FONT_HERSHEY_COMPLEX_SMALL, 1, (255, 0, 255), 2)

            img_roi = img[y: y+h, x:x+w]
            cv2.imshow("ROI", img_roi)


    cv2.imshow("Hasil", img)

    if cv2.waitKey(1) & 0xFF == ord('s'):
        cv2.imwrite("plat/scaned_img_" + str(count) + ".jpg", img_roi)
        cv2.rectangle(img, (0,200), (640,300), (0,255,0), cv2.FILLED)
        cv2.putText(img, "Plat Disimpan", (150, 265), cv2.FONT_HERSHEY_COMPLEX_SMALL, 2, (0, 0, 255), 2)
        cv2.imshow("Hasil",img)
        cv2.waitKey(500)
        count += 1
```

No	Nama File	Plat	Terdeteksi	Hasil
1	scaned_img_0.jpg	BK5403 AGH	Tidak terdeteksi lengkap	BKs403 Agh
2	scaned_img_1.jpg	BK2515 AGP	Tidak terdeteksi lengkap	PK2515 Acf
3	scaned_img_2.jpg	BK4758 AGB	Terdeteksi lengkap	BK4758 AGB
4	scaned_img_3.jpg	B 4150 ML	Tidak terdeteksi lengkap	R 4150ML
5	scaned_img_4.jpg	B 1067 NBF	Tidak terdeteksi lengkap	1067 NBF] 4122
6	scaned_img_5.jpg	B 505 WLG	Tidak terdeteksi lengkap	B 505 WLG 08+27
7	scaned_img_6.jpg	AG 4520 I	Tidak terdeteksi lengkap	Ag 4520
8	scaned_img_7.jpg	AB 3383 XB	Tidak terdeteksi lengkap	AB 9383. XBI
9	scaned_img_8.jpg	AB 5540 WE	Terdeteksi lengkap	AB 5540 WE
10	scaned_img_9.jpg	AB 4577 IX	Tidak terdeteksi lengkap	AB 4577 1X
11	scaned_img_10.jpg	DA 6434 PCN	Terdeteksi lengkap	DA 6437 PCN
12	scaned_img_11.jpg	F 5012 FM	Tidak terdeteksi lengkap	5012, fM
13	scaned_img_12.jpg	B 4792 FCS	Tidak terdeteksi lengkap	B 4792 FCSI
14	scaned_img_13.jpg	B 1964 SSJ	Terdeteksi lengkap	B 1964 SSJ
15	scaned_img_14.jpg	B 1234 WLG	Terdeteksi lengkap	B 1234 WLG


```
Image: scaned_img_14.jpg
Reference Text: B 1234 WLG
Detected Text: B 1234 WLG
Accuracy: 1.0
```

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Project 4

Database for Statistics

Online Bus Ticket Reservation System

Project Overview :

This project designs and implements a database-driven web application for online bus ticket booking. The system enables passengers to reserve tickets conveniently and allows administrators to manage buses, schedules, routes, and transactions efficiently.

Technology & Tools :

- Programming: PHP, HTML, CSS, JavaScript
- Database: MySQL
- Framework & Libraries: Bootstrap, Select2, FontAwesome
- Development Tools: XAMPP (Apache, MySQL, PHPMyAdmin)

Model & Architecture

- Database Design:
- Entities: Passenger, Bus, Driver, Schedule, City, Ticket Reservation, Admin
- Relationships: One-to-many between Passenger → Ticket, Bus → Schedule, etc.
- Normalized tables with primary & foreign keys for integrity
- Feature Engineering (System Modules):
- Admin Module: CRUD for buses, routes, cities, passengers, transactions, and schedule management
- User Module: Online booking, real-time ticket availability, automated price calculation
- Authentication: Admin login/logout with session handling
- Implementation:
- Database schema in MySQL
- Frontend with HTML + Bootstrap
- Backend with PHP (CRUD operations, validation, error handling)

https://github.com/Albani258/Portofolio_Muhammad-Nashiruddin-Al-Bani.git

Project5

Artificial Neural Networks

Glass Classification Using Learning Vector Quantization (Study of Identification and Classification of Glass Types Based on Refractive Index and Elemental Composition)

Project Overview :

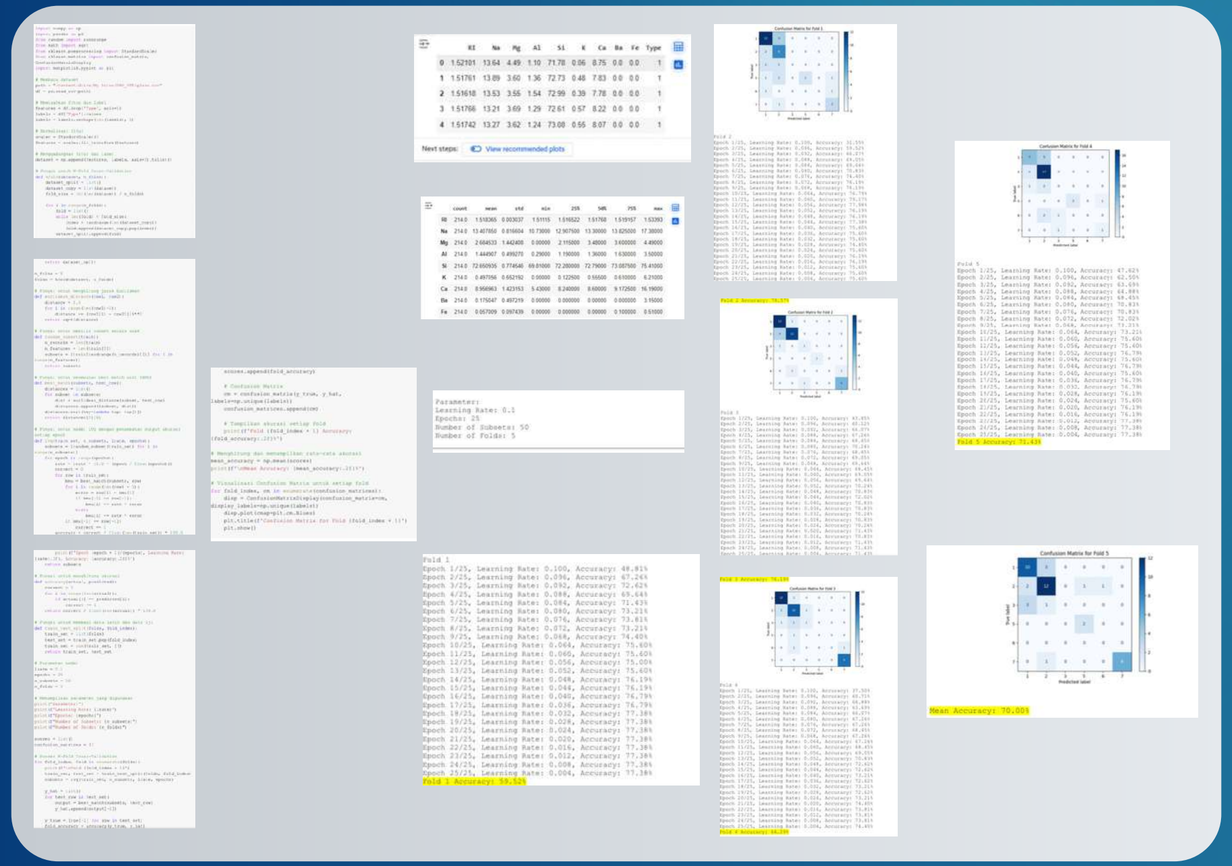
This project focuses on the classification of glass types using Learning Vector Quantization (LVQ), a supervised neural network model. The dataset consists of 214 glass samples with ten numerical features such as refractive index and chemical compositions (Na, Mg, Al, Si, K, Ca, Ba, Fe). The target variable is the type of glass, divided into seven categories (e.g., building windows, vehicle windows, containers, tableware, headlights). The purpose of this study is to support forensic investigation by accurately identifying glass fragments based on their physical and chemical characteristics.

Technology & Tools :

- Programming Language: Python
- Libraries: NumPy, Pandas, Scikit-learn, Matplotlib
- Validation Method: 5-Fold Cross-Validation
- Dataset: UCI Glass Dataset

Model & Architecture

- Machine Learning Model: Learning Vector Quantization (LVQ) neural network for glass type classification.
- Feature Engineering: Data cleaning, normalization, feature-label separation, training with Euclidean distance, learning rate 0.1, 25 epochs, and 50 representative subsets.
- Evaluation: Performance assessed with 5-Fold Cross Validation, confusion matrices, and accuracy metrics, achieving an average accuracy of 70% and peak accuracy of 78.57%.



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Project6

Risk Modeling

Optimal Portfolio Analysis in the Energy Sector Stock Using the Markowitz Model

Project Overview :

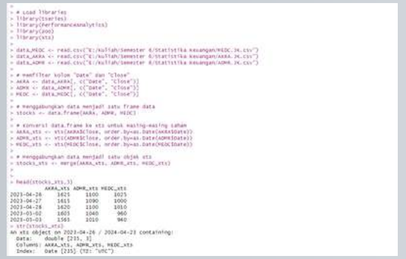
This study analyzes the optimal portfolio allocation in the Indonesian energy sector using the Markowitz Mean-Variance Model. The analysis is motivated by the global energy crisis triggered by the Russia-Ukraine war, which caused significant price fluctuations in energy-related stocks. Three companies were selected: PT AKR Corporindo Tbk (AKRA), PT Adaro Minerals Indonesia Tbk (ADMR), and PT Medco Energi Internasional Tbk (MEDC), which represent major players in energy distribution, coal, oil, and gas. The objective is to determine the optimal stock weights that maximize return and minimize risk.

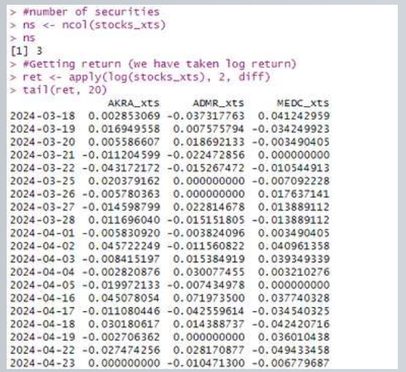
Technology & Tools :

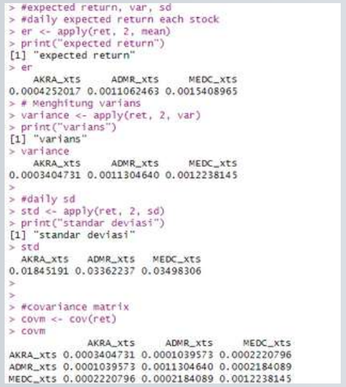
- Programming Environment: RStudio
- Packages: tseries, PerformanceAnalytics
- Data Source: Daily closing prices from Yahoo Finance (April 26, 2023 – April 23, 2024)
- Analysis: Expected return, variance, covariance, and standard deviation calculations

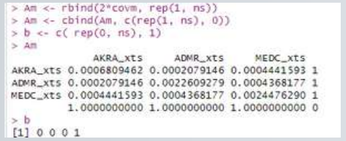
Model & Architecture

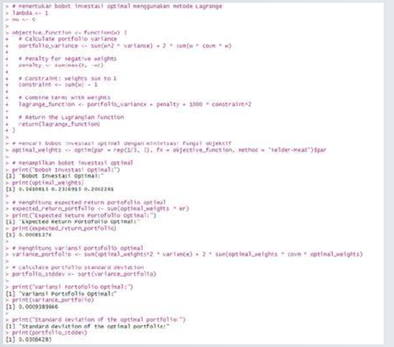
- Machine Learning Model: Markowitz Mean-Variance Portfolio Optimization
- Feature Engineering: Transformation of daily prices into returns, calculation of expected return, variance, and covariance matrix, formulation of optimization problem using the Lagrange method, and solution in matrix form to obtain portfolio weights.
- Results: The optimal portfolio weights were 56.1% for AKRA, 23.3% for ADMR, and 20.6% for MEDC, with an expected portfolio return of 0.00081 and a portfolio risk (standard deviation) of 0.0428. The results indicate a well-diversified portfolio with stable profit potential and moderate risk.











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Project 7

Econometrics Learning Book

A Practical Guide to Creating a Stock Portfolio App with R Shiny

Project Overview :

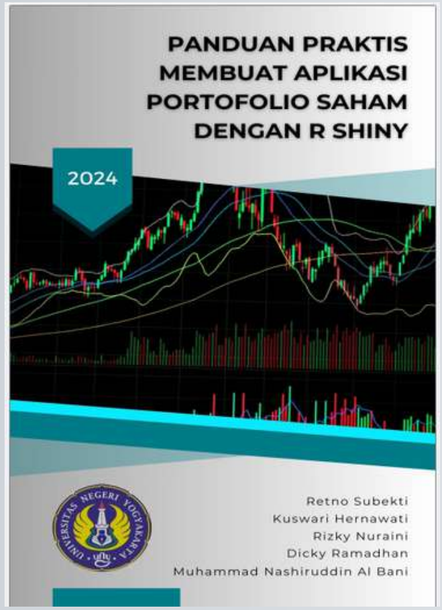
This project focuses on the development of a web-based financial portfolio application using R Shiny. The application allows users to fetch stock data directly from Yahoo Finance, calculate financial ratios such as ROA, ROE, DER, and PBV, and perform portfolio optimization using the Mean-Variance (MV) Model. The aim is to create an interactive dashboard that combines stock market data visualization, financial ratio analysis, and portfolio optimization in a single platform, making it easier for investors and analysts to monitor and evaluate their portfolios in real time.

Technology & Tools :

- Programming Environment: RStudio
- Framework: R Shiny, Shiny Dashboard
- Packages: quantmod, tidyquant, PerformanceAnalytics, PortfolioAnalytics, ROI, ggplot2, DT, openxlsx
- Data Source: Yahoo Finance API
- Deployment: Shinyapps.io / Shiny Server

Model & Architecture

- Machine Learning Model: Markowitz Mean-Variance Portfolio Optimization (without short sales)
- Feature Engineering: Stock data retrieval from Yahoo Finance, calculation of returns and covariance matrix, financial ratio computation (ROA, ROE, DER, PBV), and statistical description of returns.
- System Architecture:
- User Interface: Interactive dashboard with menus for stock data, financial ratios, and statistical description.
- Server Logic: Fetching and processing stock data, computing returns, running quadratic optimization for MV portfolio, and displaying outputs dynamically.
- Results: The application generates stock return plots, financial ratio tables, descriptive statistics, and optimal portfolio weights visualized through bar charts and tables, enabling users to make data-driven investment decisions.



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Project 8

Undergraduate Thesis

ANALYSIS OF BLACK LITTERMAN PORTFOLIO PERFORMANCE MEASUREMENT USING THE STUDENT-T COPULA APPROACH ON IDX30 STOCK

Project Overview :

This research aims to evaluate the performance of investment portfolios by comparing the Original Black-Litterman Model and the Modified Black-Litterman Model with Student-t Copula on IDX30 stocks. The objective is to examine whether the copula-based model provides better efficiency in capturing nonlinear dependencies and tail risk, which are common in volatile financial markets.

Technology & Tools :

- Programming Language: R
- Data Source: Monthly closing prices of IDX30 (May 2016 – September 2024)
- Analysis: CAPM, Johansen cointegration test, Vector Error Correction Model (VECM)
- Evaluation: Sharpe Ratio, Risk & Return metrics

Model & Architecture

- Machine Learning Model: Black-Litterman Portfolio Optimization with Student-t Copula
- Feature Engineering: Data preparation, equilibrium return estimation with CAPM, investor views generated via VECM, dependency modeling using Student-t Copula, portfolio rebalancing with 90-month rolling window, and performance evaluation using return, risk, and Sharpe Ratio.

https://github.com/Albani258/Portofolio_Muhammad-Nashiruddin-Al-Bani.git

mnashiruddin.albani23@gmail.com

Certificate

SERTIFIKAT PELATIHAN

19510809840-1475/FGA/BLSDM.Komdigi/2025

Diberikan kepada

MUHAMMAD NASHIRUDDIN AL BANI

telah menyelesaikan pelatihan

Intermediate Data Science
Fresh Graduate Academy
Digital Talent Scholarship 2025

yang diselenggarakan oleh **Pusat Pengembangan Talenta Digital**

pada tanggal **21 Juli 2025 - 10 Agustus 2025** selama **20 Jam Pelatihan**

Jakarta, 13 Agustus 2025

Ditandatangani secara elektronik
KEPALA BADAN PENGEMBANGAN SDM KOMDIGI
BONIFASIUS W. PUDJIANTO

Dokumen ini telah ditandatangani secara elektronik menggunakan sertifikat elektronik yang diterbitkan oleh Balai Sertifikasi Elektronik (BSrE), Badan Siber dan Sandi Negara (BSSN)

Intermediate Data Science – Fresh Graduate Academy | Digital Literacy Development Center, Digital Talent Scholarship 2025 | Ministry of Communication and Digital of the Republic of Indonesia

SERTIFIKAT PELATIHAN

19510439840-369/FGA/BLSDM.Komdigi/2025

Diberikan kepada

MUHAMMAD NASHIRUDDIN AL BANI

telah menyelesaikan pelatihan

Fundamental Data Science
Fresh Graduate Academy
Digital Talent Scholarship 2025

yang diselenggarakan oleh **Pusat Pengembangan Talenta Digital**

pada tanggal **16 Juni 2025 - 6 Juli 2025** selama **13 Jam Pelatihan**

Jakarta, 7 Juli 2025

Ditandatangani secara elektronik
KEPALA BADAN PENGEMBANGAN SDM KOMDIGI
BONIFASIUS W. PUDJIANTO

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Fundamental Data Science – Fresh Graduate Academy | Digital Literacy Development Center, Digital Talent Scholarship 2025 | Ministry of Communication and Digital of the Republic of Indonesia

SERTIFIKAT PELATIHAN

2299818850-4635/MS/BLSDM.Komdigi/2025

Diberikan kepada

MUHAMMAD NASHIRUDDIN AL BANI

telah menyelesaikan pelatihan

Pengenalan Data Science dan Pemanfaatannya di Berbagai Sektor
Micro Skill
Digital Talent Scholarship 2025

yang diselenggarakan oleh **Pusat Pengembangan Literasi Digital**

pada tahun **2025** selama **1 Jam Pelatihan**

Jakarta, 12 Mei 2025

Ditandatangani secara elektronik
KEPALA BADAN PENGEMBANGAN SDM KOMDIGI
BONIFASIUS W. PUDJIANTO

Dokumen ini telah ditandatangani secara elektronik menggunakan sertifikat elektronik yang diterbitkan oleh Balai Sertifikasi Elektronik (BSrE), Badan Siber dan Sandi Negara (BSSN)

Introduction to Data Science and Its Utilization in Various Sectors – Micro Skills | Digital Literacy Development Center, Digital Talent Scholarship 2025 | Ministry of Communication and Digital of the Republic of Indonesia

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Certificate

PwC Switzerland Power BI Job Simulation on Forage - August 2024

Funded Proposal Recipient – Community Service Student Creativity Program (PKM-PM) Puspresnas | Ministry of Education, Culture, Research, and Technology

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Certificate


Pemerintah Kabupaten Sleman
Dinas Komunikasi dan Informatika

NO : 002/017.024/XI/2023

SERTIFIKAT

Sertifikat ini diberikan kepada

Muhammad Nashiruddin Al Bani

sebagai

Enumerator

dalam Kegiatan Survei Pemanfaatan Wifi Padukuhan Kabupaten Sleman Tahun 2023
yang diselenggarakan atas kerjasama antara Dinas Komunikasi dan Informatika Kabupaten Sleman
dengan Fakultas Matematika dan Ilmu Pengetahuan Alam Universitas Negeri Yogyakarta
pada Juni s.d. November 2023

Kepala Dinas Komunikasi dan Informatika
Kabupaten Sleman

Ir. Suryo Prihantoro, S.Si, M.Kom

Enumerator Certificate – Padukuhan WiFi Utilization Survey, Department of Communication and Informatics of Sleman Regency in collaboration with the Statistics Department, UNY


KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET, DAN TEKNOLOGI
PUSAT PRESTASI NASIONAL
BALAI PENGEMBANGAN TALENTA INDONESIA

Sertifikat

Nomor: 33452/BPTI/DIKTI/2023

Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, Pusat Prestasi Nasional,
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Muhammad Nashiruddin Al Bani

UNIVERSITAS NEGERI YOGYAKARTA

atas partisipasi dan pencapaiannya sebagai:

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pada **Pekan Ilmiah Mahasiswa Nasional (PIMNAS) ke 36 Tahun 2023**
yang diselenggarakan Balai Pengembangan Talenta Indonesia sebagai unit pelaksana teknis Pusat Prestasi Nasional,
Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi bekerja sama dengan Universitas Padjadjaran
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Judul Ciptaan	Ecobrick Revolution: Transforming Waste Into Sustainable Solutions
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THANK YOU

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