Report of Internship at

Feynn Labs

Submitted by

Yogeshwar Manerikar
MCA Semester VI
1928

Under the guidance of

Sanjay Basumatary
Data Analysis & Machine Learning

GOA BUSINESS SCHOOL

Goa University
Taleigao Plateau Goa– 403206
June 2022

GOA UNIVERSITY

GOA BUSINESS SCHOOL

Certificate of Evaluation

This is to certify that **Mr. Yogeshwar Maneikar** has been evaluated for the project work titled "***Report of Internship done at Feynn Labs***" undertaken at ***Feynn Labs***, in partial fulfillment for the award of the degree in Master of Computer Applications.

_____ _____

Internal Examiner Examiner

Date:

Place:

_____

Dean, Goa Business School,
Goa University

Acknowledgement

Interning in a company is a golden opportunity for learning and self-development specially to have so many wonderful people led me through this internship period. The internship wouldn't be complete without expressing my gratitude and appreciation to all the people who made it possible.

Thank you for guidance of **Nihal Pegu (Business Analyst) and Sanjay Basumatary (Data Analyst)** for support and guidance . Giving the time to resolve the query's. AIPL for giving me this opportunity to work on these projects and for all the guidance, time, patience, support and encouragement provided to me during the internship.

I would like to extend my gratitude to **Ms. Priya B** (**Associate**) for being my friend and always helping me out whenever I was in dire need.

I am also grateful to the members of my team especially **Mr. Navin Jasti (Intern), Abhinav(Team Lead)** for all the help and encouragement which helped me in this project.

Finally, I would like to express my gratitude towards the Feynn Labs family who were always ready to help me and guide me in all aspects of life. They have transformed me into a new and renewed person ready to face head-on any challenges that come my way.

-Yogeshwar Manerikar

INTRODUCTION

This internship report describes the several Projects carried out during a **4 months**, full time Internship period by **Mr. Yogeshwar Santosh Manerikar** which commenced on the 7th February 2022 at Feynn Labs in accordance with curriculum of the VI semester Industrial Training of the MCA program, Goa University, Goa.

This report highlights my learning experience and my contributions to the organization as an intern. This will describe the knowledge that I gained by successfully completing the tasks that were assigned to me.

In the following chapters a small description of the company, the technologies studied and tools used during the internship, and also other projects I have done during the internship.

Finally, my experience with the company during the internship is described.

FEYNN LABS
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UDYAM-AS-19-0000179
GSTIN: 18CDDPB8175P1ZZ

INTERNSHIP CERTIFICATE

This is to certify that

Yogeshwar Santosh Manerikar

Son of Santosh Manerikar has successfully completed four months of Machine Learning Internship Program at Feynn Labs Services from 7th February, 2022 to 7th June, 2022 during which he has worked on the following Projects:

1. AI Product/Service Prototyping
2. Market Segmentation using Machine Learning and Data Analysis
3. AI Product/Service Business and Financial Modeling

PROJECT MENTOR

JUNE 8th, 2022
DATE

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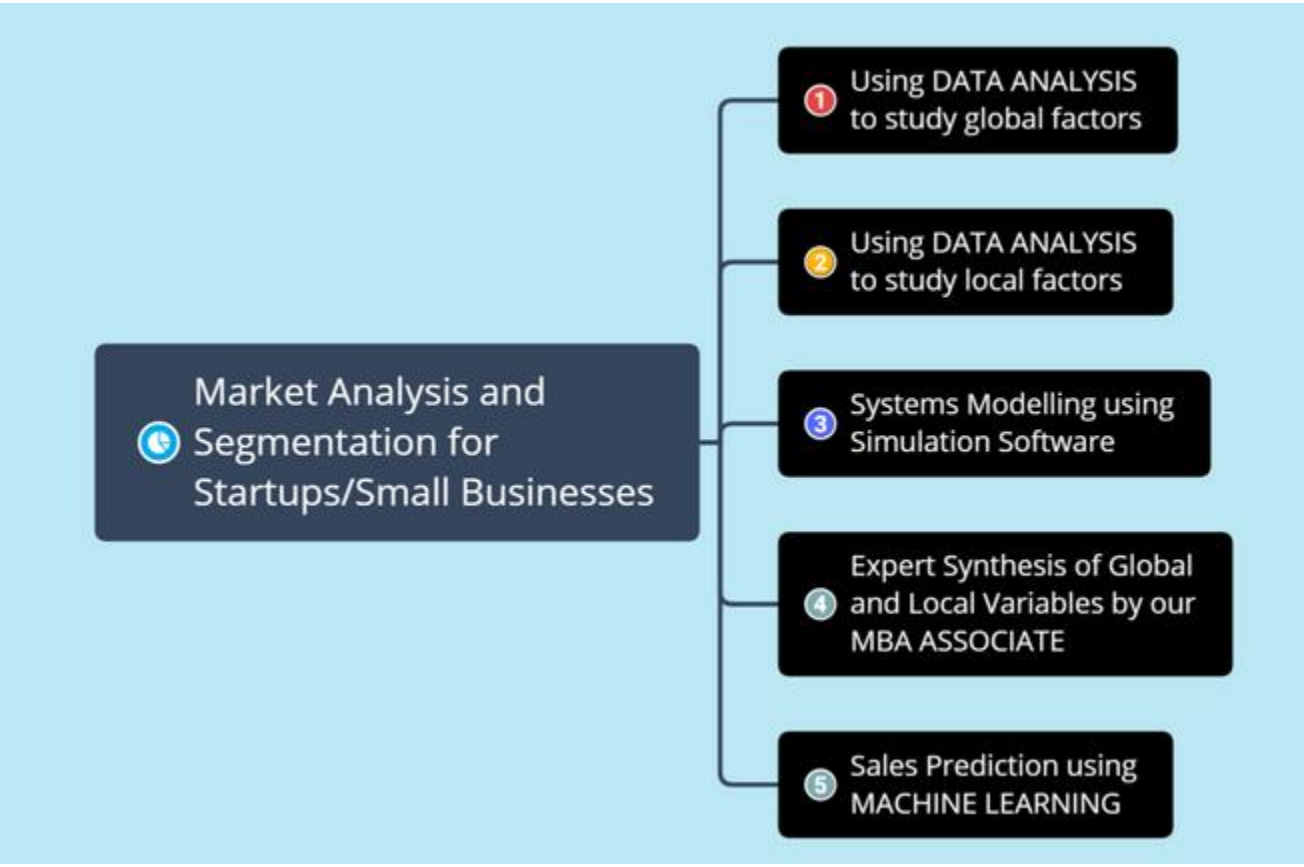
Company Profile

Feynn Labs is an Artificial Intelligence company currently focusing on AI integration in Small/Medium Businesses and providing high quality education in AI/Machine Learning. Our goal is to build premier chain of institutes in India where students will apply and experiment with what they learn hand in hand, with our "Project based Top-Down Learning" approach focusing in frontier technologies like Artificial Intelligence, Crypto-currency, Quantum Computing, Augmented Reality etc.

Feynn Labs Services is the B2B unit of Feynn Labs where we provide Artificial Intelligence integrated services like Market Analysis and Segmentation, Customer Segmentation etc. to Businesses using Data Analysis and Machine Learning



Under our Smart Regions initiative, we aim to bring innovations in Deep Tech such as IoT, Machine Learning, Data Analysis, Blockchain etc. to a region and meet challenges in the fields of housing, traffic, mobility, social and environmental issues, employment, education etc.

Project 1-Bio tech

Problem Steatment

Analyze Medical Market in India with respect Bio-Tech Startup going to launch its Home Checkup Service with Online Booking offering for B.P. , Diabetes & Vitamins

Market segmentation is a decision-making tool for the marketing manager in the crucial task of selecting a target market. In the **Healthcare industry**, a company willing to offer different services to different **target audiences** will lead to the sustainable growth of the company.

respect to the given problem statement using Segmentation analysis and come up with a feasible strategy to enter the market, targeting the segments most likely to use their product in terms of Geographic, Demographic, Psychographic, Behavioral.

Overview

In this Project, our goal is to gather information about the present health care market in India and to obtain detailed knowledge about some of the specifics like online health service appointment bookings from various states and also parts of those states and customers from which region of India are willing to use smart devices for monitoring their vitals like Diabetes level, Blood Pressure, and vitamin deficiencies.

This will be done using analytical methods and market segmentation to draw out segments using the limited amount of data obtained from several trusted platforms, including government open source.

We have to analyze Medical Market in India with respect to the given problem statement using Segmentation analysis and come up with a feasible strategy to enter the market

Tools and Technologies used

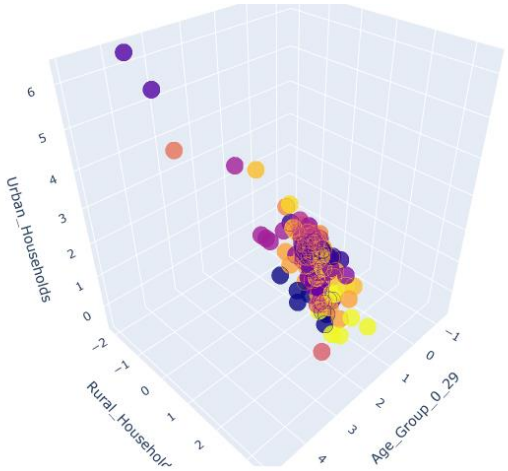
- Google Colab
- Git
- Jupyter notebooks
- Excel
- Word
- OpenRefine
- High charts
- Google docs

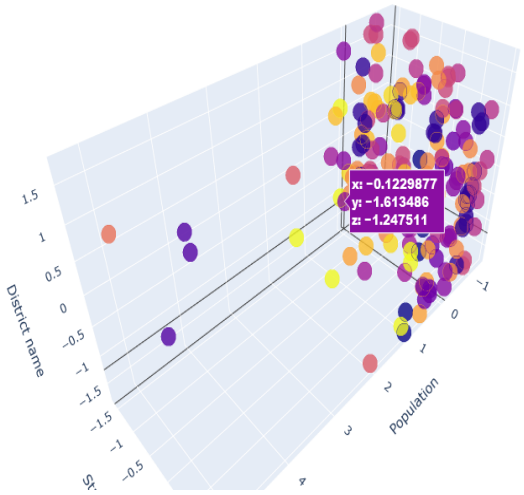
My contribution

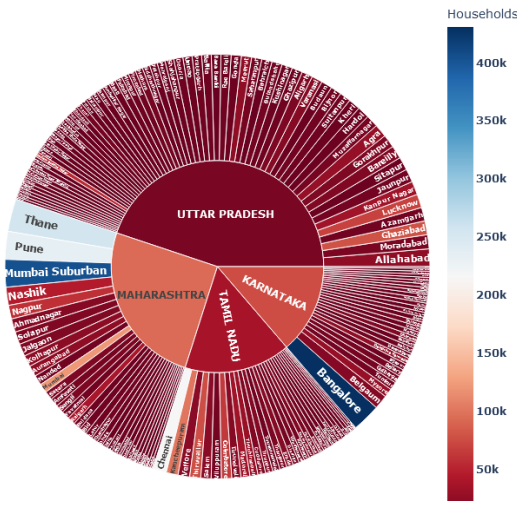
- Data collection
- Building chats

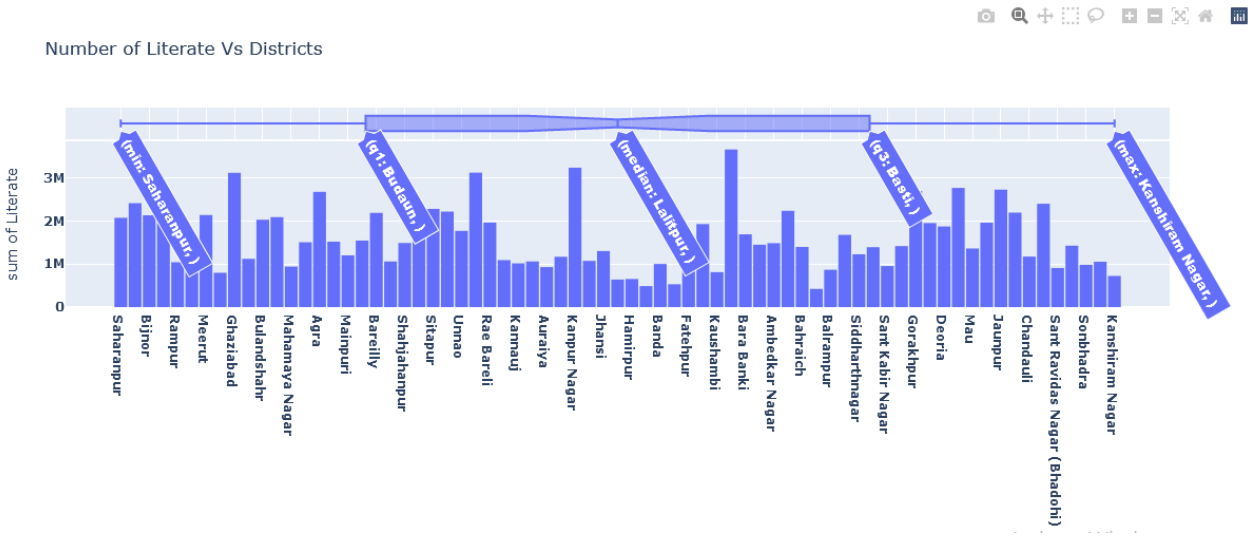
- Documentations
- Research on the domain
- Data Preparing

```
States in Cluster1 are  ['Chhatisgarh' 'Madhya Pradesh' 'Jharkand' 'Odisha' 'Assam' 'Mizoram'
 'Tripura' 'Andhra Pradesh' 'Telengana']
States in Cluster2 are  ['Uttar Pradesh' 'Bihar']
States in Cluster3 are  ['Delhi' 'Haryana' 'Punjab' 'Uttarakhand' 'Manipur']
States in Cluster4 are  ['Himachal Pradesh' 'Jammu & Kashmir' 'West Bengal' 'Arunachal Pradesh'
 'Meghalaya' 'Nagaland' 'Sikkim' 'Goa' 'Karnataka' 'Kerala' 'Tamil Nadu']
States in Cluster5 are  ['Rajasthan' 'Gujarat' 'Maharashtra']
```









Project 2- Restaurant Menu Design based on Customer Test Behavior

Problem Statement

Identifying the trend in the sales of food items. So it helps the restaurant to predict the day-by-day food master menu

Overview

A lot of food is being wasted across the country. Restaurants plan its menu according to the test behavior pattern of customers. Restaurants can get max profit with minimum utilization of resources. All previously bill data is with restaurants.

I used that data to build one master menu for a restaurant Many solutions are being suggested to solve this problem. AI is one among them and I strongly believe that AI can contribute a lot to this field. AI can not only solve problems in this field but it can also optimize the techniques that are being used for decades.

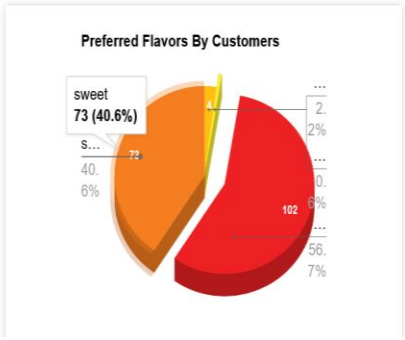
Tools and Technologies used

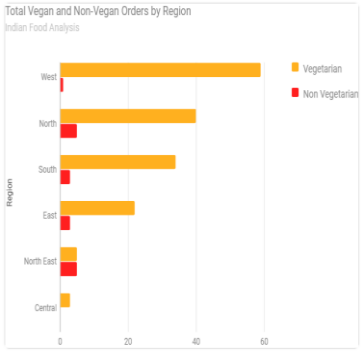
- Jupyter notebooks
- Excel
- Word
- OpenRefine
- Collab
- Google docs

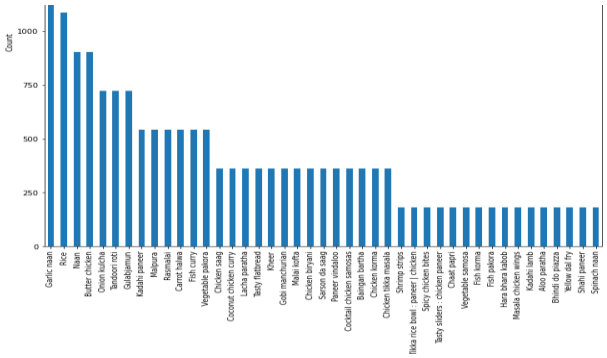
My contribution

- Feature selection
- Charts
- Documentation
- Add a description in the markdown
- Keep track of insightful Graphs
- Use clustering algorithm

4.1 Preferred Flavors By Customers



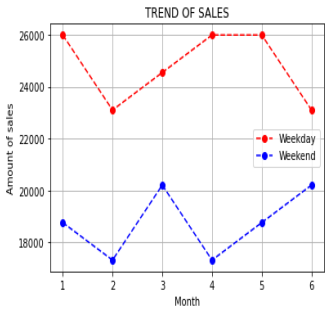




$$Percent = \frac{\sum Vegetarian}{\sum (Vegetarian + NonVegetarion)}$$

- $Percent$ = Ratio of the total number of vegan orders to the total number of orders
- $\sum Vegetarian$ = Total Vegan Orders by Region
- $\sum (Vegetarian + NonVegetarion)$ = Total number of vegan and non-vegan orders in the region

- **98.33%** of all orders from the **West** region are on a vegan diet.
- **88.88%** of all orders from the **North** region are on a vegan diet.
- **91.89%** of all orders from the **South** region are on a vegan diet.
- **88.00%** of all orders from the **East** region are on a vegan diet.
- **50.00%** of all orders from the **North East** region are on a vegan diet.
- **100%** of all orders from the **Central** region are on a vegan diet.



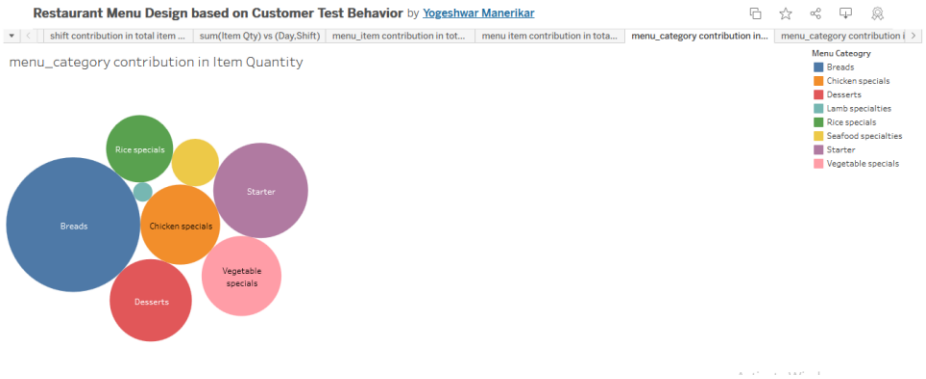
Towards the end the restaurants weekend sales seems to have picked up but the weekday sales has not been increasing.

Insights :-

- PartySize of 5 predominantly comes for dinner.
- Weekends dominate weekday.
- Sales on Saturday and Sunday are the highest which was not the case with the normal trend.
- Breads is still the most preferred one but Desserts comes in second place whereas starter came in second place for the whole dataset.
- Only hours 12 and 19 are the sales hours for PartySize of 5.

- The customers come to the restaurant mostly during the 'Lunch' shift as evident from the shift count value.
- One would assume that weekend count will be the most but the count for weekday is more. This is because it is the count of 5 weekdays to count of 2 weekend days.
- Sales on all days is almost the same excepts Monday.
- People come to the hotel to party as a group of 5. Based on this the hotel could give some discounts to party size of 5 to bring in more customers.
- Breads is the most preferred food in the Menu Category.
- People order just one quantity most often.
- Sales on almost all the months is the same.
- Most customers come to eat around 12 which is inline with the higher 'Lunch' count.
- Count for PM is more because the hotel opens around 11 AM.
- Most of the customers go for vegetarian foods. Note that vegetarianism includes sweets and snacks as well.

For Learning I made Tabulo Dashboard



Project 3- Heart Disease Prediction

Problem statement

a reliable, accurate and feasible system to diagnose Cardio Vascular Diseases in time for proper treatment.

Overview

The heart is the next major organ compared to the brain which has more priority in the Human body. It pumps the blood and supplies it to all organs of the whole body. Prediction of occurrences of heart diseases in the medical field is significant work. Data analytics is useful for predicting from more information and it helps the medical center to predict various diseases.

A huge amount of patient-related data is maintained on monthly basis. The stored data can be useful for the source of predicting the occurrence of future diseases

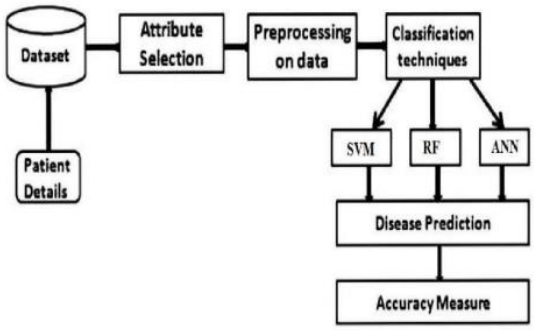
Tools and Technologies used

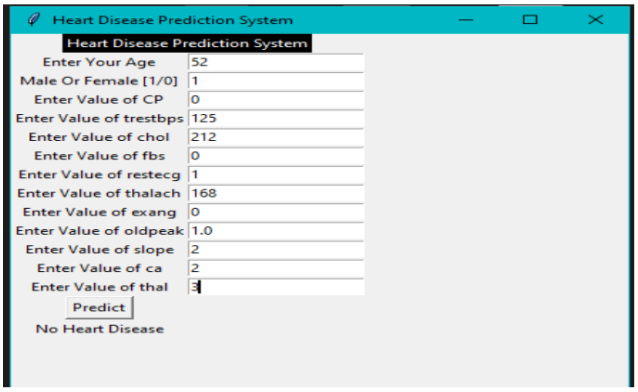
- Colab
- Jupiter notebook
- Google docs

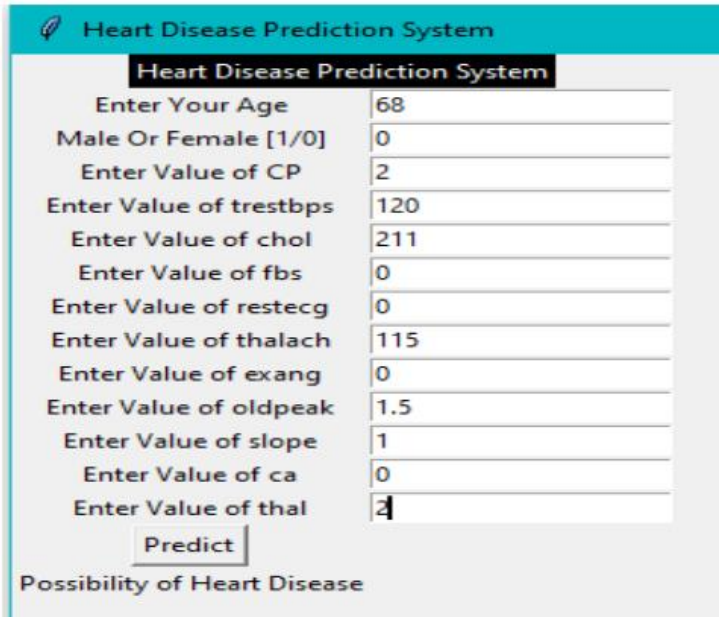
My contribution

- Charts
- Model accuracy
- Proposed System (prototype)
- Report
- Deal with noises, duplicates, and missing values of the dataset.

Proposed System:







#	Attributes	Description	Values
1	Age	Patient's age in years	Continuous Value
2	Sex	Sex of Patient	1 = Male 0 = Female
3	Cp	Chest pain	Value 1: typical angina Value 2: atypical angina Value 3: non-angina pain Value 4: asymptomatic
4	Trestbps	Resting blood pressure	Continuous value in mm/Hg
5	Chol	Serum cholesterol in mg/dl	Continuous value in mg/dl
6	Fbs	Fasting blood sugar	1 ≥120 mg/dl 0 ≤ 120 mg/dl
7	Restecg	Resting electrocardiographic results	0 = normal 1 = having_ST_T wave abnormal 2 = left ventricular hypertrophy
8	Thalach	Maximum heart rate achieved	Continuous value
9	Exang	Exercise induced angina	1: yes 0: no
10	Oldpeak	ST depression induced by exercise relative to rest	Continuous value
11	Slope	the slope of the peak exercise ST segment	1: upsloping 2: flat 3: down sloping
12	Ca	number of major vessels colored by fluoroscopy	0-3 value
13	Thal	defect type	3 = normal 6 = fixed defect 7 = reversible defect
14	num	diagnosis of heart disease	no_heart_disease have_heart_disease

Project 4- Shopping Cart Pattern (Apriori Algorithm)

Overview

Cart Analysis project is to determine what constitutes an **item**, an **itemset**, and a **transaction**. This will depend on the dataset which used and the question attempting to answer.

a set of transactions, find rules that will predict the occurrence of an item based on the occurrences of other items in the transaction.

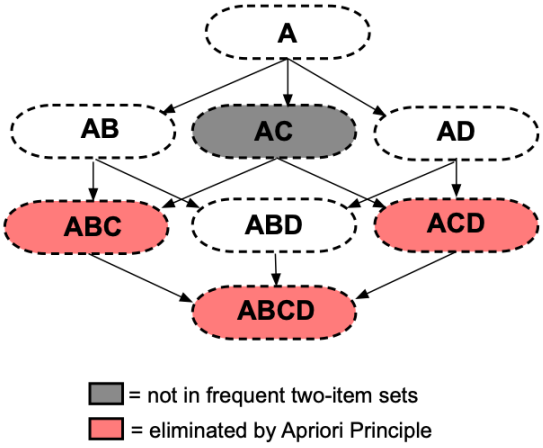
{Diaper} → {Beer}, {Milk, Bread} → {Eggs,Coke}, {Beer, Bread} → {Milk}

Tools and Technologies used

- Colab
- Jupiter notebook
- Google docs

My contribution

- Prepare data for use in Market Basket Analysis.
- Identify patterns in consumer decision-making
- Use metrics to evaluate the properties of patterns.
- Construct association rules that provide concrete recommendations for businesses.



Association rule: an "if-then" relationship between two itemsets.

- **rule:** if *{coffee}* then *{milk}*.
- **antecedent:** coffee
- **consequent:** milk

Metric: a measure of the strength of association between two itemsets.

- **rule:** if *{coffee}* then *{milk}*
- **support:** 0.10
- **leverage:** 0.03

Out[36]:

	antecedents	consequents	antecedent support	consequent support	support	confidence	lift	leverage	conviction
0	(baby)	(bed_bath_table)	0.029664	0.096827	0.000175	0.005893	0.060856	-0.002697	0.908527
1	(bed_bath_table)	(baby)	0.096827	0.029664	0.000175	0.001805	0.060856	-0.002697	0.972091
2	(cool_stuff)	(baby)	0.037345	0.029664	0.000206	0.005507	0.185633	-0.000902	0.975709
3	(baby)	(cool_stuff)	0.029664	0.037345	0.000206	0.006932	0.185633	-0.000902	0.969375
4	(baby)	(furniture_decor)	0.029664	0.066310	0.000123	0.004159	0.062728	-0.001844	0.937590

Notice that `association_rules` automatically computes seven metrics.

Project 5- Image Processing for Grain Qulity Detection

Overview

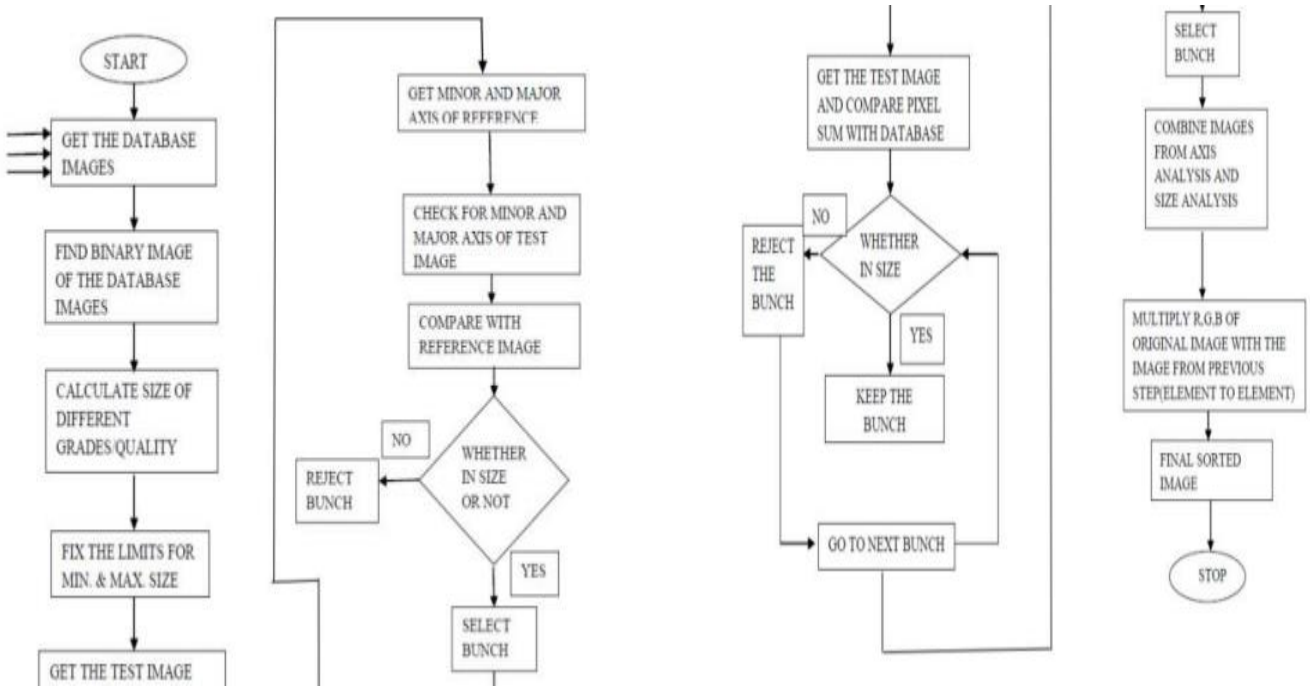
An machine vision system is introduced which is used for grain type identificatito on and different type of grains based on special features.

In the present grain-identification and detection system type of grain and grain quality are identified manually by visual inspection which is difficult and not accurate.

My contribution Learning task

- Proposal and learning the image processing
- Conclusion
  The main purpose of this project is to provide better approach for identification & detection of grains. Here all measurement are stored in variable 'Grain size' and each measurement direction separately in its own corresponding variable. Variable 'Grain size' probability levels includes the grain size at different probability level and the average grain size is output into variable average grain size. The relative grain size dispersion is sorted in

variable. Also, it is fast, less memory consumable and cost effective. In the up gradation of this method, a grading of grains can be done on the basis of grain size



Other Tasks and Learning

- Mevan analytics Dashboards competitions

  Spotify Dashboard, Olympic Dashboard
- Linked in skill batch for Machine learning
- Hacker rank MySQL Practice:

  Earned silver medal in SQL practice in hacker rank
- Post Graduation Data Analytics and Data Science going on from Skill-lync

Tools and Technologies Used

- Python is a programming language that lets you work quickly and integrate systems more effectively.
- Its language constructs and object-oriented approach aim to help programmers write clear, logical code for small and large-scale projects.
- Python strives for a simpler, less-cluttered syntax and grammar while giving developers a choice in their coding methodology.

- PyCharm is an integrated development environment (IDE) used in computer programming,
- specifically for the Python language. It is developed by the Czech company JetBrains
- PyCharm provides smart code completion, code inspections, on-the-fly error highlighting and quick-fixes, along with automated code refactorings and rich navigation capabilities.

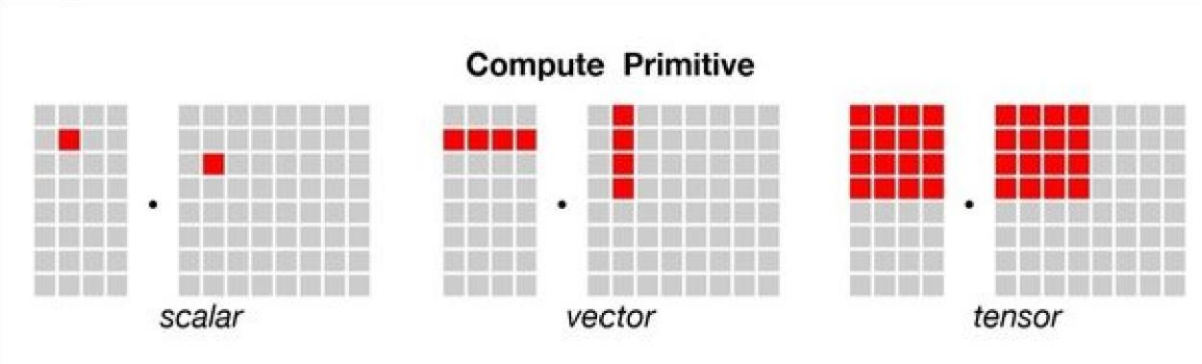
- **Anaconda is a free and open-source distribution of Python for scientific computing such as data science, machine learning applications, large-scale data processing, predictive analytics, etc. The Anaconda distribution includes data-science packages suitable for Windows, Linux, and MacOS.**
- **Access and manage the most powerful data science and machine learning libraries, packages, and tools the open- source community has to offer.**

It is a web-based interactive computational environment for creating Jupyter notebook documents. The "notebook" term can colloquially make reference to many different entities, mainly the Jupyter web application, Jupyter Python web server, or Jupyter document format depending on context. A Jupyter Notebook document follows a format of an ordered list of input/output cells which can contain code, text (using Markdown), mathematics, plots and rich media, usually ending with the ".ipynb" extension.

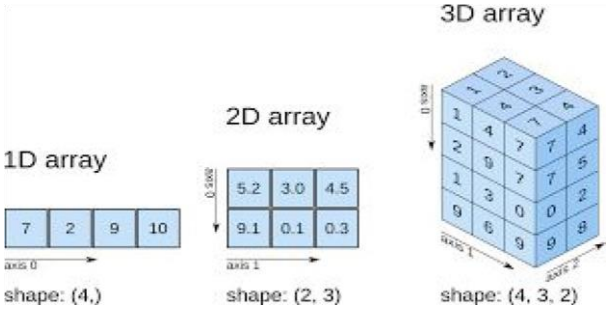
Colaboratory is a free Jupyter notebook environment that requires no setup and runs entirely in the cloud.

With Colaboratory you can write and execute code, save and share your analyses, and access powerful computing resources, all for free from your browser.

Google Colab provides an introduction to computing on a GPU in Colab. In the google colab notebook you will connect to a GPU, and can run basic computation operations on both the CPU and a GPU, observing the speedup provided by using the GPU.



A notebook is a list of cells. Cells contain either explanatory text or executable code and its output.



- NumPy is the core library for scientific computing in Python.
- NumPy is a Python package which stands for 'Numerical Python'. It is the core library for scientific computing, which contains a powerful n-dimensional array object, and provides tools for integrating C, C++ etc. It is also useful in linear algebra, random number capability etc.
- NumPy package is used to perform different operations. The ndarray (NumPy Array) is a multidimensional array used to store values of the same datatype. These arrays are indexed just like Sequences, starting with zero.
- The main advantages of NumPy arrays is that it occupies significantly less space which reduces the memory needed to process it. It performs faster operations compared to standard arrays which helps in scientific calculations where big data is available.

- Pandas is a fast, powerful, flexible and easy-to-use open-source data analysis and manipulation tool. It is a library built on top of the Python programming language.

- Tools for reading and writing data between in-memory data structures and different file formats.
- Data alignment and integrated handling of missing data.
- Provides data filtration.

Pandas is mainly used for machine learning in the form of dataframes. Pandas allow importing data of various file formats such as csv, tsv, excel etc. Pandas allows various data manipulation operations such as group-by, join, merge, melt, and concatenation as well as data cleaning features such as filling, replacing or imputing null values: curing the data.

Microsoft Excel is one of the most popular applications for data analysis. Equipped with built-in pivot tables, they are without a doubt the most sought-after analytic tool available. It is an all-in-one data management software that allows you to easily import, explore, clean, analyze, and visualize your data. In this article, we will discuss the various methods of data analysis in Excel.

Sorting data is a very critical and vital part of Data Analysis. You can sort your Excel data by multiple columns or even a single column. The sorting is done in ascending or descending order as well.

Scikit-learn is an indispensable part of the Python machine learning toolkit at JPMorgan. It is very widely used across all parts of the bank for **classification, predictive analytics, and very many other machine learning tasks**.

Like PyTorch it is less mature than Tensorflow, but it provides simple and efficient tools for data mining and data analysis.

quality of its documentation combine to make scikit-learn simultaneously very approachable and very powerful.

Seaborn is **a Python data visualization library based on matplotlib**. It provides a high-level interface for drawing attractive and informative statistical graphics.

Seaborn is a library for **making statistical graphics in Python**. It builds on top of matplotlib and integrates closely with pandas data structures. Seaborn helps you explore and understand your data.

Seaborn helps you explore and understand your data. Its plotting functions operate on dataframes and arrays containing whole datasets and internally perform the necessary semantic mapping and statistical aggregation to produce informative plots. Its dataset-oriented, declarative API lets you focus on what the different elements of your plots mean, rather than on the details of how to draw them.

Microsoft Power BI is used **to find insights within an organization's data**. Power BI can help connect disparate data sets, transform and clean the data into a data model and create charts or graphs to provide visuals of the data. All of this can be shared with other Power BI users within the organization.

Power BI is a collection of software services, apps, and connectors that work together to **turn your unrelated sources of data into coherent, visually immersive, and interactive insights**. Your data may be an Excel spreadsheet, or a collection of cloud-based and on-premises hybrid data warehouses.

Power Query is **a tool in Microsoft Excel that simplifies the process of importing data from different source files and sorting them into an Excel sheet in the most convenient and usable format**. Power Query is a user-friendly business intelligence tool that does not require the user to learn any specific code.

MySQL MySQL is an open-source relational database management system. Its name is a combination of "My", the name of co-founder Michael Widenius's daughter, and "SQL", the abbreviation for Structured Query Language.

MySQL is **ideal for storing application data**. Additionally you should use MySQL if you need a relational database which stores data across multiple tables. As MySQL is a relational database, it's a good fit for applications that rely heavily on multi-row transactions

Project timeline/Project diary

Feb 2022

- Week 1:
    1. Learning Libraries and brush-up the Python
    2. Implementing EDA
    3. Learning Feature Engineering and Feature selection
- Week 2:
    1. Charts and objectives seaborn
    2. Started working on BIOTECH STARTUP LAUNCH Project
    3. Collection of data , variables extraction, Edge case analysis
- Week 3:
    1. Learning market segmentation analysis (behavioral, demographic, geographic)
    2. Collection of data, feature selection, cleaning, EDA
- Week 4:
    1. Learning Clustering and classification algorithms.
    2. Implementing model to data
    3. Rectifying the Loss of model and maximizing the score

March 2022

- Week 1:
    1. Prepared the report for BIOTECH STARTUP LAUNCH all insight
    2. Studying the market mix
    3. Research about Vitamin deficiency , blood sugar
- Week 2:
    1. Started working Restaurant Menu Design based on Customer Test Behavior
    2. Research on web finding the data , Validating ,features
- Week 3:
    1. Data Pre-Processing, Cleaning
    2. EDA implementation
- Week 4:
    1. Fit a model, error checking
    2. Rescale the model , Predict, using different accuracy parameter

April 2022

- Week 1:
    1. Research on Dashboard, Data modeling
    2. Power Bi Brush-up, DAX, Tabulo Dashboad
    3. Implementing the dashboard in Power BI
- Week 2:
    1. Participated in dashboard competition
    2. Research in Heart disease . data about heart disease.
- Week 3:
    1. ANN and CNN
    2. Heart disease data cleaning

3. Data preprocessing

- Week 4:
    1. Random Forest, Support Vector Machine (SVM).
    2. Plotting the graphs , EDA
- Week 5:
    1. Building the model
    2. Accuracy checking
    3. Creating the reports

May 2022

- Week 1:
    1. Learn tkinter
    2. Implement the front end
- Week 2:
    1. Computer vision and algorithms
    2. Learning project
    3. Report for praposal
- Week 3:
    1. Apriori algorithm Learning
    2. 5 ways to handle null values
    3. Research in the Shopping cart domain, patterns
- Week 4:
    1. Cleaning data, preprocessing
    2. Feature selection.
    3. Learning to implement a model

June 2022

- Week 1:
    1. Implementing EDA
    2. Solving the math for the Apriori algorithm
- Week 2:
    1. Report on Apriori algorithm

My reflections/ experiences of internship.

Letter of Recommendation

Date: 8th June, 2022

To Whom It May Concern:

It is with great pleasure that I write this Letter of Recommendation for **Mr. Yogeshwar Santosh Manerikar** from Goa University, who worked under **Feynn Labs Services** as a **Machine Learning and Data Analysis** Intern for a period of four months from 7th February to 7th June, 2022. During this period he has been very capable in handling all the assigned tasks and projects.

Mr. Yogeshwar Santosh Manerikar is very passionate about solving real world problems through the use of Machine Learning and Data Analysis. He is very creative with his product/service ideas, but also keeps in the mind the real world constraints under consideration in the prototyping phase.

He presented excellent ideas in his AI Product/Service Prototyping Project. He also coordinated well with his teammates in Market Segmentation Project for Bio-Tech Market.

He is adaptable as work circumstances and situations change. He will be an asset to any Market Analysis team due to his wide range of Machine Learning and Data Analytics skillset.
In addition to above, Mr. Yogeshwar Santosh Manerikar is dedicated to providing quality work. He strives to make his project reports and codes as thorough and detailed as possible. His enthusiasm serves to motivate everyone on his team.

I, therefore, recommend Mr. Yogeshwar Santosh Manerikar without any hesitancy, knowing he is worthy of top consideration in the Machine Learning and Data Analytics profession.

Sincerely,

Sanjay Basumatary
Founder, CEO
Feynn Labs
UDYAM-AS-19-0000179
GSTIN: 18CDDPB8175P1ZZ

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https://www.youtube.com/

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https://medium.com/

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Specific Projects Reference

One hot encoding and why label encoding is not enough: https://hackernoon.com/what-is-one-hot-encoding-why-and-when-do-you-have-to-use-it-e3c6186d008f

Keras and TensorFlow: https://www.bmc.com/blogs/tensorflow-vs-keras/

Gradient Descent & Backpropagation:https://www.youtube.com/watch?v=Ilg3gGewQ5U

AWS: https://www.youtube.com/watch?v=FXvlq89Ph_4

Keras Tutorial For Beginners Edureka: https://www.youtube.com/watch?v=XNKeayZW4dY

Playground_Tensorflow: https://rebrand.ly/u142ylt

Useful insights into Data Science and help in building the model:https://towardsdatascience.com/

Books

Market segmentation and management by **Sara Dolnicar**

Visual analytics by **A Mosavi**

Data Modeling **Andy Culter**

Research papers

https://www.springer.com

https://www.sciencegate.app

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