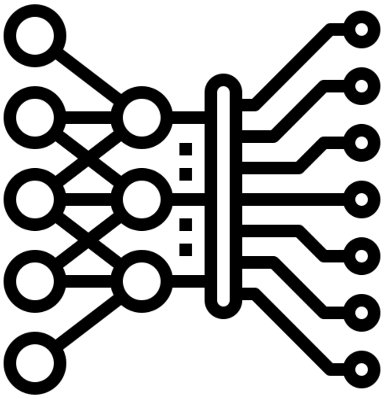
School of Engineering & Technology

Asian Institute of Technology

AT82.03 - Machine Learning



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Group Project <Group 11>

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Table 1. Grocery data

Description	Comprehensive grocery product info from Real Canadian Superstore, Canada.
Potential Applications	Price Comparison, Market Basket Analysis, Inventory Management, Data Visualization.
Related Industry	E-commerce and retail; Unique focus on Real Canadian Superstore for tailored insights
Impact	Customers: Informed shopping; Retailers: Efficient operations and competitive edge
Value Proposition	Informed Decision-Making, Efficient Retail Ops, Enhanced Customer Exp, Competitive Adv., Research & Insights.

https://www.kaggle.com/datasets/maximsakhan/rc-superstore-grocery-data/data

Table 2. Supermarket data

Description	Consumer behavior data from Hunter's e-grocery, a lifestyle brand in 10 counties
Potential Applications	K-Means Clustering & PCA for customer segmentation, Apriori & Causal ML for product recommendation
Related Industry	Similar applications in e-commerce; Unique focus on diverse customer behaviors across countries
Impact	Customers benefit from personalized recommendations; Retailers optimize inventory and marketing.
Value Proposition	Informed Decision-Making, Improved Customer Experience, Adaptability to Market Events.

https://www.kaggle.com/datasets/hunter0007/ecommerce-dataset-for-predictive-marketing-2023
https://www.kaggle.com/datasets/yapwh1208/supermarket-sales-data

Table 3. Nutritional facts for most common foods

Description	Nutritional content of 300+ foods, including Calories, Fats, Proteins, and more.
Potential Applications	Unsupervised learning for Dietary planning, Nutrition apps, Healthcare guidance, Food industry product development.
Related Industry	Used in nutrition and healthcare; Unique for diverse food categories and nutrients.
Impact	Individuals make healthier choices, Healthcare professionals advise better, Food industry benefits
Value Proposition	Informed eating, Versatile applications, Valuable nutritional data source.

https://www.kaggle.com/datasets/niharika41298/nutrition-details-for-most-common-foods/data

Table 4. Million song data

Description	Spotify Million Song Dataset with song names, artist names, links, and lyrics.
Potential Applications	Song name predictions from the lyrics, Song recommendation, Song classification, Song clustering based on lyrics and metadata.
Related Industry	Common in music streaming and recommendation services; Unique for a large song dataset.
Impact	Music listeners discover new songs, Music platforms enhance recommendations.
Value Proposition	Personalized music discovery, Versatile applications for music industry and listeners.

https://www.kaggle.com/datasets/thaisneubauer/million-song-dataset-studies
https://www.kaggle.com/datasets/undefinenull/million-song-dataset-spotify-lastfm

Table 5. Individual using the internet world wide

Description	The global usage of the internet is a phenomenon that has revolutionized the way people communicate, access information, conduct business. Series ID, Series Code, Series Name, Series Parent, Series Unit, Entity ID, Entity Iso, Entity Name, Data Value Data Year, Data Source, Description.
Potential Applications	Communications, Information Access, E-commerce, Entertainment, Education
Related Industry	Technology, Telecommunication, E-commerce, Media & Entertainment
Impact	Global Connectivity, Information Acess, Economic Growth, Education and Skill Development
Value Proposition	The value proposition of global internet usage lies in its ability to empower individuals, drive economic growth, foster innovation, and enhance quality of life. It offers opportunities for education, communication, entrepreneurship, and access to a vast array of services and information.

https://datahub.itu.int/data/?i=11624

Table 6. Access To Electricity World Wide (1990-2020)

Description	Dataset: Access To Electricity World Wide with Country Name, Country Code, Indicator Name, Indicator Code, Year
Potential Applications	Household Lighting and appliance, Industrial and Commercial Aciivites, Human Deveropment Index, Education.
Related Industry	Common use in energy sector, power generation, distribution and renewawable energy sources. Technology and infrastructure, energy transmission.
Impact	Common in Economic growth, Education and Healthcare, Poverty Alleviation, Quality of Life
Value Proposition	The value proposition of addressing global access to electricity lies in its potential to drive economic growth, improve social well-being, and advance sustainable development.

https://ourworldindata.org/energy-access

Table 7. Employment ratio between male and female

Description	The employment ratio between males and females worldwide represents the proportion of men and women in the labor force, providing insights into gender disparities in the workplace. Entity, Code, Year, Employment to ratio men, Employment to ration Women, Population, Continent.
Potential Applications	Gender Equality Assessment, Policy Development, Wokforce Planing, Economy Analysis.
Related Industry	Labor and employment, Human Resource, Education and Trainign
Impact	Gender Equality, Economic Growth, Innovation and Cretitivty
Value Proposition	The value proposition of addressing gender disparities in employment lies in achieving greater gender equality, economic prosperity, and social well-being

https://ourworldindata.org/grapher/ratio-of-female-to-male-labor-force-participation-rates-ilo-wdi

Table 8. Urban Population Gowth (1960-2022)

Description	Urban population growth worldwide refers to the phenomenon of an increasing number of people residing in urban areas within countries across the globe. Country Name, Country Code, Indicator Name, Indicator Code, Year
Potential Applications	Urban Planning, Real Estate Development, Transportation, Economic Developement.
Related Industry	Urban Planning and Develpment, Transportation and Mobility, Retail and Commerece
Impact	Economic Oppoturnity, Infrastructure Challenges, Environmental Consideration.
Value Proposition	The value proposition of understanding and managing urban population growth lies in achieving sustainable urban development and improving the quality of life for urban residents.

https://data.worldbank.org/indicator/SP.URB.GROW

Table 9. US road accidents data

Description	countrywide car accident dataset that covers 49 states of the USA. The accident data were collected from February 2016 to March 2023, using multiple APIs that provide streaming traffic incident (or event) data.
Potential Applications	Predicting accident severity and likelihood by some environmental and location features (classification problem).
Related Industry	Transportation, Insurance, infrastructure
Impact	Reduced accidents and traffic congestion, Improved safety measures, Enhanced insurance risk assessment, Efficient urban development
Value Proposition	By the final model, the likelihood of accident and its severity can be predicted.

https://www.kaggle.com/datasets/sobhanmoosavi/us-accidents

Table 10. Cancer data

Description	variables about death rate and some social and medical situation of patients for 2010 – 2016 period.
Potential Applications	classification problem of cancer patient based on some economic and demographic features
Related Industry	Healthcare, Research, sociology
Impact	Enhanced understanding of cancer socio-economic causes, Informed healthcare policies, Improved safety measures, Enhanced insurance risk assessment, Efficient urban development
Value Proposition	improve cancer care

https://data.world/nrippner/ols-regression-challenge

Table 11. Road accident data

Description	detailed information on road accidents reported over multiple years. The dataset encompasses various attributes related to accident status, vehicle and casualty references, demographics, and severity of casualties.
Potential Applications	Accident causality analysis and prevention strategies, Road safety prediction and improvement recommendations, Targeted public safety interventions, Infrastructure planning and maintenance optimization
Related Industry	Transportation, Public Safety, Urban Planning
Impact	Safer roads and reduced accidents, Informed infrastructure planning, Effective public safety policies, Insights into accident causest
Value Proposition	Enhancing road safety

https://www.kaggle.com/datasets/juhibhojani/road-accidents-data-2022

Table 12. e-commerce behavior data

Description	behavior data for 7 months (from October 2019 to April 2020) from a large multi-category online store. Each row in the file represents an event. All events are related to products and users. Each event is like many-to-many relation between products and users.
Potential Applications	Customer segmentation and personalized product recommendations, Fraud detection and prevention, Customer churn prediction and retention strategies, Sales forecasting and inventory optimization
Related Industry	Ecommerce, Marketing
Impact	Improved customer experience and engagement, Reduced fraud and increased security, Higher customer retention and revenue,- Efficient inventory management
Value Proposition	improving market knowledge

https://www.kaggle.com/datasets/mkechinov/ecommerce-behavior-data-from-multi-category-store

Table 13. Twitter (X) trending words

Description	Both trending topics, and people that use them on Twitter during 4 years.
Potential Applications	Guess what people are interesting and its transition
Related Industry	Social media, marketing, data analyses
Impact	It is helpful for marketing and is able to know the world's needs and interests.
Value Proposition	From the perspective of marketing, it can provide what people are interested in.

https://www.kaggle.com/datasets/hwassner/trending-topics/data

Table14. Video games sales dataset

Description	A dataset of video game sales from 2013 to 2020 is included. it includes information on platform, region, genre, and sales amount.
Potential Applications	Can be used for analysis of the video game industry, marketing research, and investment decision-making.
Related Industry	Video game industry, marketing, and investment industries.
Impact	Can identify new trends and opportunities for video game industries.
Value Proposition	Can provide customer needs and trendings to video game industries.

https://www.kaggle.com/datasets/sidtwr/videogames-sales-dataset

Table 15. Data science job salaries

Description	A dataset of data science job salaries from 2020 to 2022, includes information on job title, experience, skills, and location.
Potential Applications	Can be used for analysis of data science job salary levels, career planning, and salary negotiation.
Related Industry	data science, human resources, and salary management industries.
Impact	Helpful for our future decision and planning.
Value Proposition	Provides valuable information about data science job salaries and can be used by data scientists, job seekers, and businesses to understand data science job salaries and make better decisions.

https://www.kaggle.com/datasets/ruchi798/data-science-job-salaries

Table 16. Speed dating experiment

Description	A dataset of speed dating participants from a speed dating event. The dataset includes information on participants' age, gender, occupation, income, and hobbies, information on participants' ratings of each date partner's attractiveness and desire to meet again.
Potential Applications	Can be used for analysis of the factors that contribute to the success of speed dating, development of matching algorithms, and improvement of dating apps.
Related Industry	Dating, matching, and dating app industries.
Impact	Increase people’s happiness.
Value Proposition	Can be used by researchers, businesses, and individuals to make gf or bf efficiently.

https://www.kaggle.com/datasets/annavictoria/speed-dating-experiment

Table 17. **Medical Cost Personal Datasets**

Description	Medical insurance dataset containing details of users for a medical Insurance company: age, sex, bmi, index of body weight, children / Number of dependents, smoker, region, health insurance charges. Medical Datasets are in the public domain but simply needed some cleaning up and recording to match the format in the book.
Potential Applications	It can be used to explore and analyze medical insurance matters or health condition trends, patterns, and relationships with other related areas
Related Industry	Primary health care system, medical insurance, personal health management
Impact	This data is useful for these people and is useful to make predictions of the insurance cost they will have to pay
Value Proposition	People are always confused about their medical insurance and don't know the cost of insurance at different ages and conditions.

https://www.kaggle.com/datasets/rajgupta2019/medical-insurance-dataset

Table 18. **Asian Development Bank - Procurement data**

Description	This dataset is Procurement Plan by Origin of Goods and Services financed from ADB funds
Potential Applications	It can be used to explore and analyze procurement plan in term of foreign funding and trends, patterns, and relationships with economic development investment spheres
Related Industry	Government sector, Line ministries of countries and independent assessment entities

Impact	Procurement by origin presents the details of procurement by origin of goods and services. Origin of goods is the place where the goods have been mined, grown, cultivated produced, manufactured, or processed (or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components).
Value Proposition	Procurement by origin presents the details of procurement by origin of goods and services. Overall context of works, consulting and other services, nationality, or places of incorporation and service providers.

https://www.kaggle.com/datasets/zsinghrahulk/asian-development-bank-procurement-data

Table 19. Singapore waste management

Description	The dataset contains data from waste data management causing pollution of the environment, it is divided between two timelines, from 2003 to 2017 and 2018 to 2020. It also has additional energy generation data per material type.
Potential Applications	The National Environment Agency (NEA), research and analysis problems in waste and recycling management
Related Industry	Government sector, Municipalities and public entities , NGO sector as well
Impact	Discover how much Singapore is saving energy per years by recycling. Singapore has limited land for building new incineration plants or landfills. How to motivate citizens by sharing the total energy that the combined recycling efforts have saved every year
Value Proposition	a new milestone of becoming a zero-waste nation and worry about the rising number of waste disposal. At the current pace the Semakau Landfill will run out of space by year 2035 which is an alarming situation for Singaporeans

https://www.kaggle.com/datasets/kingabzpro/singapore-waste-management

Table 20. Water quality data

Description	Dataset: The dataset contains 200 rows, each representing a unique water quality measurement across all six parameters.
Potential Applications	The dataset suits various data science applications such as data visualization, machine learning, and statistical analysis. It can be used to explore and analyze water quality trends, patterns, and relationships
Related Industry	Health and Sanitation, Environmental Sustainability, Water management
Impact	Water quality is a crucial aspect of environmental management, and it is essential to measure various physical, chemical, and biological parameters to monitor it effectively.
Value Proposition	provides a representative snapshot of water quality and can be used for various research, education, and decision-making purposes

https://www.kaggle.com/datasets/shreyanshverma27/water-quality-testing

Table 21 . Global Wealth Inequality Database

Description	This is the amalgamation various data sources, including national accounts, survey data, fiscal records, and wealth rankings. Through this comprehensive approach, the Global Wealth Inequality Database enables precise tracking of the evolution of income and wealth levels, ranging from the lowest to the highest strata of society. What distinguishes this initiative is its systematic utilization of such data, permitting comparisons across countries and over extended timeframes. This innovative undertaking builds upon the research on long-term inequality trends crafted by an international consortium of scholars over the past 15 years.
Potential applications	Wealth Inequality Prediction Poverty Identification Fair Wage Analysis Data-Driven Advocacy
Related Industry	● Nonprofit and Philanthropic ● Organizations Government and Public Policy ● International Organizations (INGOs) ● Microfinance and Social Enterprise
Impact	● Identifying Root Causes ● Policy Design ● Monitoring Global Progress ● Philanthropy and Aid Allocation

Value proposition	Potential to address one of the most pressing and pervasive societal challenges of the current era. Offers a powerful toolset for tackling one of the most persistent and challenging global issuesCan drive informed decision-making, optimize resource allocation, expand financial inclusion, ultimately contributing to a more equitable and prosperous world.

https://www.kaggle.com/datasets/lasaljaywardena/global-wealth-inequality-database

Table 22. Gun Violence Data

Description	The dataset contains a record of more than 260k gun violence incidents, with detailed information about each incident, available in CSV format. The data was downloaded from gunviolencearchive.org. The dataset contains 29 columns
Potential applications:	Study gun violence patterns and statistics and make informed predictions about future trends. Using gun violence data to make informed predictions about future trends can have significant impacts on public policy, law enforcement strategies, and community safety efforts. ● Gun violence data can inform the development and modification of gun control policies and legislation. ● Law enforcement agencies can use predictive models based on gun violence data to allocate resources more effectively. ● Community organizations and public health agencies can use predictive models to identify individuals or groups at higher risk of involvement in gun violence.
Related Industry	No robust application have been developed in this field apart from some research and manual alert applications
Impact	● Law Enforcement Agencies ● Government and Policymakers ● Community Organizations ● General Public
Value proposition	The value proposition of using gun violence data to make informed predictions about future trends lies in its potential to save lives, improve public safety, and guide more effective policies and interventions.

https://www.kaggle.com/datasets/jameslko/gun-violence-data

Table 23. Loan Default Prediction Dataset

Description	This dataset has been taken from Coursera's Loan Default Prediction Challenge and will provide you the opportunity to tackle one of the most industry-relevant machine learning problems with a unique dataset that will put your modelling skills to the test. The dataset contains 255,347 rows and 18 columns in total.
Potential applications	Predictive modeling using a Loan Default Prediction Dataset can have several significant impacts on financial institutions, borrowers, and the overall lending industry. ● Loan default prediction models are crucial for financial institutions to assess and manage credit risk. ● Accurate predictive modeling can lead to a reduction in the number of loans granted to individuals or businesses likely to default, resulting in fewer financial losses for the institution. ● Minimizing loan defaults can help financial institutions stabilize their financial health.
Related Industry	● Banking ● Credit Unions ● Online Lending Platforms ● Finance Companies
Impact	● Lenders and Financial Institutions ● Borrowers ● Investors ● Financial Analysts and Researchers
Value proposition:	Provide valuable insights and benefits to various stakeholders involved in the lending industry ● Risk Mitigation ● Enhanced Decision-Making ● Customer-Centric Approaches ● Reduced Loan Application Processing Time

https://www.kaggle.com/datasets/nikhil1e9/loan-default

Table 24. Asia Pacific: Storm tracks 1956 to 2018

Description	This dataset provides a comprehensive record of tropical storm paths in the Asia Pacific region from 1956 to 2018. It includes detailed attributes for each storm such as the storm's name, advisory date and time, wind speed, pressure, type, and GPS coordinates for each advisory point. The dataset has many source files including shape files and dbf files with over 227,000 entries and 12 columns.
Potential applications	● **Climate Research**: Analyze trends in storm frequency, intensity, and location to understand changes in climate over time. ● **Risk Assessment**: Identify areas at high risk of storms for disaster planning and mitigation.
Related Industry	● Weather Forecasting Services ● Navigation and Marine Industry ● Environmental Research
Impact	● Public Safety ● Disaster Preparedness and Response ● Economic Impact ● Tourism and Hospitality
Value proposition	Provides a wide range of benefits to governments, businesses, communities, and individuals. ● Reduced Property Damage ● Lives Saved ● Preparedness

https://www.kaggle.com/datasets/lasaljaywardena/asia-pacific-storm-dataset

Table 25. Summary

Selected data set	Speed dating experiment (Table 16)
This dataset looks most promising and feasible because: **- Rich Information:** The dataset contains a diverse range of information about participants, including age, gender, occupation, income, hobbies, and ratings of date partners' attractiveness and desire to meet again. This rich information allows for multifaceted analysis and insights. **- Human Interaction Study:** It provides valuable insights into human behavior and preferences in the context of dating and social interactions, making it promising for research in psychology, sociology, and human behavior analysis. **- Machine Learning Potential:** With machine learning techniques, this dataset can be used to develop predictive models for various outcomes, such as predicting the likelihood of a successful date or compatibility between individuals. **- Recommendation Systems:** It can be used to build innovative recommendation systems for dating platforms, suggesting potential matches based on compatibility metrics derived from the dataset. **- Social Insights:** Analyzing the dataset can reveal trends and patterns in dating preferences across different demographics, leading to a better understanding of societal norms and preferences. **- Business Applications:** Dating apps and platforms can leverage this data to improve user experiences, enhance matchmaking algorithms, and create more effective marketing strategies. **- Ethical Considerations:** However, it's important to note that this dataset should be handled with sensitivity to privacy and ethical concerns, ensuring that participant identities and sensitive information are protected. ***Which datasets can be potentially combine to create a very unique application?*** The domain of this dataset is very special so may not combine with other datasets. But some found datasets such as road accidents, grocery and supermarket data, and world development indicators, internet usage by individuals and sex ratio could be combined to develop a better applications.	