TRAVEL INSURANCE PREDICTION

1.INTRODUCTION

Travel insurance is a vital aspect of travel planning that provides travelers with financial protection against unforeseen events that may occur during a trip. These events could include medical emergencies, flight cancellations, lost or stolen luggage, and other travel-related mishaps. With the rise in global travel, the demand for travel insurance has grown exponentially, with travellers looking for the most cost-effective and comprehensive coverage.

This predictive model will utilize machine learning, data mining, and statistical analysis techniques to identify patterns and trends in the data. The model will examine historical data on past travel insurance purchases, demographic information, and travel itinerary to predict the likelihood of an individual purchasing travel insurance. In this project, we have some database history.of the customer as a dataset. The target variable of this dataset is the customer will buy travel insurance or not. The goal of this project is to create a predictive model that can accurately predict the likelihood of an individual purchasing travel insurance based on various factors like Age, Income, Number of Family members etc.

1.1 Overview

The Predictive Modeling for Travel Insurance Claims project aims to develop a data-driven solution to assess the risk of travel insurance claims. Travel insurance is essential for both travelers and insurance companies, providing financial protection in case of unexpected events during trips. However, insurance companies face challenges in accurately pricing policies and managing risks associated with claims. This project seeks to leverage data analytics and machine learning to improve the accuracy of risk assessment and enhance decision-making in the travel insurance industry.

1.2 Purpose

The purpose of travel insurance prediction is to leverage data and analytics to enhance decision-making in the travel insurance industry. By accurately assessing risk, detecting fraud, optimizing pricing, and improving customer experiences, insurance companies can provide better services to their policyholders while managing their own financial risk effectively.

2. LITERATURE SURVEY

A literature survey on travel insurance involves reviewing existing academic research, articles, and publications related to various aspects of travel insurance. Below, I've provided an overview of key themes and findings from the literature on travel insurance up to my last

knowledge update in September 2021. Keep in mind that more recent research may have emerged since that time.

2.1 Existing problem

There were several existing problems and challenges in travel insurance prediction. These challenges are important for the insurance industry to address to improve the accuracy of risk assessment, fraud detection, and customer service.

1. **Data Quality and Availability:** Many travel insurance prediction models rely on historical data. However, data quality can be a significant issue, with missing or inconsistent information. Additionally, obtaining relevant external data (e.g., weather, geopolitical events) can be challenging.
2. **Limited Historical Data for Uncommon Events:** Uncommon or catastrophic events (e.g., global pandemics, natural disasters) can have a profound impact on travel insurance claims. Modeling these events accurately requires a substantial amount of historical data, which may be limited for such rare occurrences.
3. **Changing Travel Patterns:** Travel behavior and patterns can change rapidly, making it challenging to develop accurate predictive models. Events like the COVID-19 pandemic have had a significant impact on travel, leading to shifts in travel destinations, purposes, and durations.
4. **Fraud Detection Complexity:** Fraudulent claims in travel insurance can be sophisticated and challenging to detect. Fraudsters may use various tactics to deceive insurers, making it essential to develop advanced fraud detection algorithms.
5. **Inadequate Data Privacy and Security:** Handling sensitive customer data in travel insurance prediction requires robust data privacy and security measures. Ensuring compliance with data protection regulations (e.g., GDPR) is crucial but can be complex.
6. **Lack of Real-Time Data:** Timely information is essential for accurate risk assessment and fraud detection. However, accessing real-time data, such as flight delays, health advisories, or political instability, can be challenging.
7. **Model Overfitting and Generalization:** Ensuring that predictive models generalize well to new data is crucial. Overfitting to historical data can lead to poor model performance when faced with new and unforeseen situations.
8. **Customer Engagement:** Encouraging travelers to purchase travel insurance and providing them with relevant coverage options can be a challenge. Many travelers may be unaware of the benefits of travel insurance or perceive it as an additional expense.
9. **Regulatory Compliance:** The travel insurance industry is subject to various regulations and laws that can vary by region and change over time. Insurers must navigate a complex regulatory landscape to ensure compliance.
10. **Ethical Considerations:** The use of personal data in predictive modeling raises ethical concerns, especially when it comes to profiling travelers and determining their risk factors.
11. **Interconnected Risks:** Travel insurance risks are interconnected, meaning that an event in one part of the world can affect claims in another. Managing these interconnected risks can be challenging.

12. **Crisis Management:** The ability to respond to large-scale crises or emergencies, such as natural disasters or pandemics, is critical for travel insurers. Developing crisis management strategies and predictive models for such events is a complex task.

2.2 Proposed Solution

1) Data Quality Improvement:

- **Data Cleansing and Standardization:** Implement data cleansing techniques to identify and rectify missing or inconsistent data. Standardize data formats to ensure consistency across datasets.

2)Limited Historical Data for Uncommon Events:

- **Scenario-Based Modeling:** Develop scenario-based modeling to simulate rare events using available historical data and expert knowledge. This can help predict the impact of unprecedented events.

3)Changing Travel Patterns:

- **Real-Time Data Integration:** Integrate real-time data sources, such as flight schedules, weather updates, and travel advisories, into predictive models to adapt quickly to changing travel behavior.

4)Fraud Detection Complexity:

- **Machine Learning and AI:** Employ machine learning and AI-based fraud detection algorithms that can continuously learn and adapt to new fraud patterns. Utilize anomaly detection techniques to flag suspicious claims.

5)Data Privacy and Security:

- **Data Encryption and Compliance:** Implement robust data encryption methods and ensure strict compliance with data protection regulations. Anonymize or pseudonymize customer data where possible.

6)Lack of Real-Time Data:

- **API Integration:** Establish API connections with relevant data providers to access real-time information on flights, weather conditions, and geopolitical events.

7)Model Overfitting and Generalization:

- **Regularization Techniques:** Apply regularization techniques in machine learning models to prevent overfitting. Continuously update and fine-tune models to adapt to changing conditions.

8)Customer Engagement:

- **Education and Personalization:** Educate travelers about the benefits of travel insurance through personalized communication. Offer a range of coverage options that cater to different travel needs and budgets.

9)Regulatory Compliance:

- **Regulatory Monitoring:** Establish a dedicated compliance team to monitor changes in regulations and ensure that the company remains compliant. Implement robust data governance practices.

10)Ethical Considerations:

- **Ethical AI Frameworks:** Develop and adhere to ethical AI frameworks that prioritize transparency, fairness, and accountability in predictive modeling. Obtain informed consent for data usage.

11)Interconnected Risks:

- **Global Risk Assessment:** Collaborate with international partners and organizations to assess global risks comprehensively. Develop models that consider the interdependencies of risks.

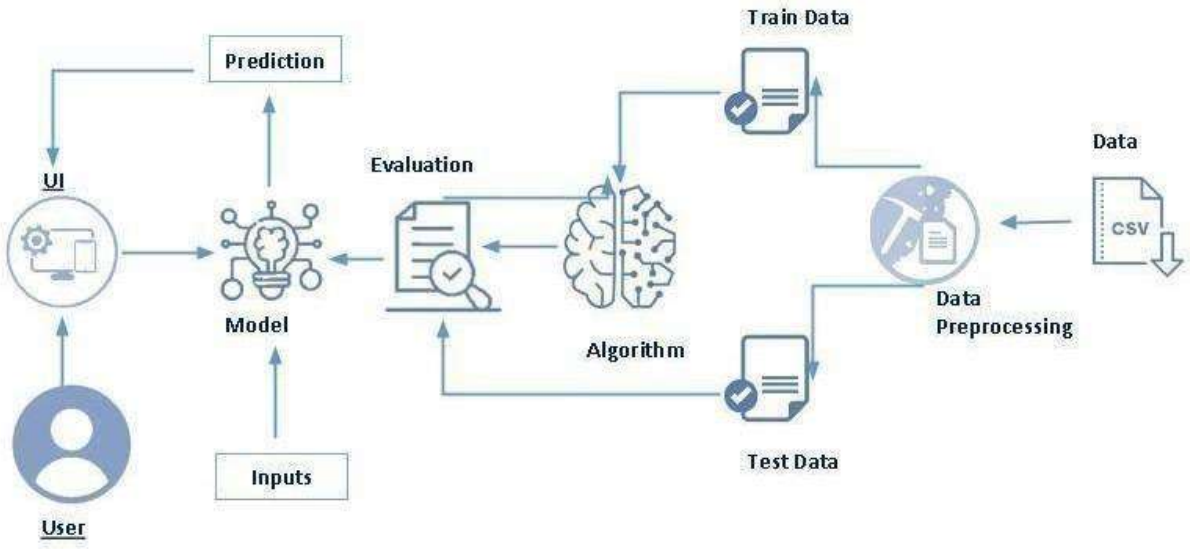
12)Crisis Management:

- **Crisis Response Protocols:** Develop crisis response protocols and models that can adapt to large-scale crises. Utilize historical data from past crises for predictive analysis.

It's important for travel insurance companies to remain agile and proactive in adopting new technologies and strategies to stay ahead of emerging risks and changing customer needs. Regularly reviewing and updating predictive models is crucial to ensuring their effectiveness in a dynamic travel insurance landscape.

3.THEORITICAL ANALYSIS

3.1 Block Diagram



3.2 Hardware/Software Designing

Hardware Requirements:

Computer/Server: You will need a computer or server with sufficient processing power and memory to handle data preprocessing, model training, and evaluation. The exact hardware specifications will depend on the scale of your project. A modern multi-core processor and a minimum of 8GB of RAM are typically recommended for small to medium-scale projects.

Storage: You will need adequate storage space to store your dataset, intermediate files, and model artifacts. The storage capacity required will depend on the size of your dataset.

software requirements :

Operating System: Most commonly used operating systems such as Windows, macOS, or Linux can be used. Linux distributions are often preferred for machine learning projects due to their flexibility and compatibility with many data science libraries.

Python: Python is the primary programming language for data analysis and machine learning. You'll need to install Python along with libraries such as NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, and TensorFlow or PyTorch (for deep learning). You can manage Python packages using tools like pip or conda.

4. EXPERIMENTAL INVESTIGATIONS

When working on a blood donation prediction project, several investigations are typically conducted to understand the data, develop the prediction model, and ensure the project's success.

1. Data Exploration and Understanding:

Data Profiling: Investigate the dataset's structure, size, and basic statistics (e.g., mean, median, standard deviation) for each feature.

Feature Analysis: Explore the distribution of individual features, identify outliers, and check for missing values.

Data Visualization: Create visualizations such as histograms, box plots, scatter plots, and correlation matrices to uncover patterns and relationships in the data.

2.Data Preprocessing:

Handling Missing Data: Investigate the causes of missing data and apply appropriate techniques, such as imputation or removal, to address missing values.

Outlier Detection: Investigate potential outliers and decide whether to remove them or transform them to improve model robustness.

Data Scaling/Normalization: Investigate the need for feature scaling or normalization, especially if the chosen machine learning algorithm requires it.

3.Model Selection and Training:

Algorithm Investigation: Experiment with various machine learning algorithms (e.g., logistic regression, decision trees, SVM, neural networks) to determine which one performs best for the specific prediction task.

Hyperparameter Tuning: Investigate different hyperparameter settings through techniques like grid search or randomized search to optimize model performance.

4.Model Evaluation:

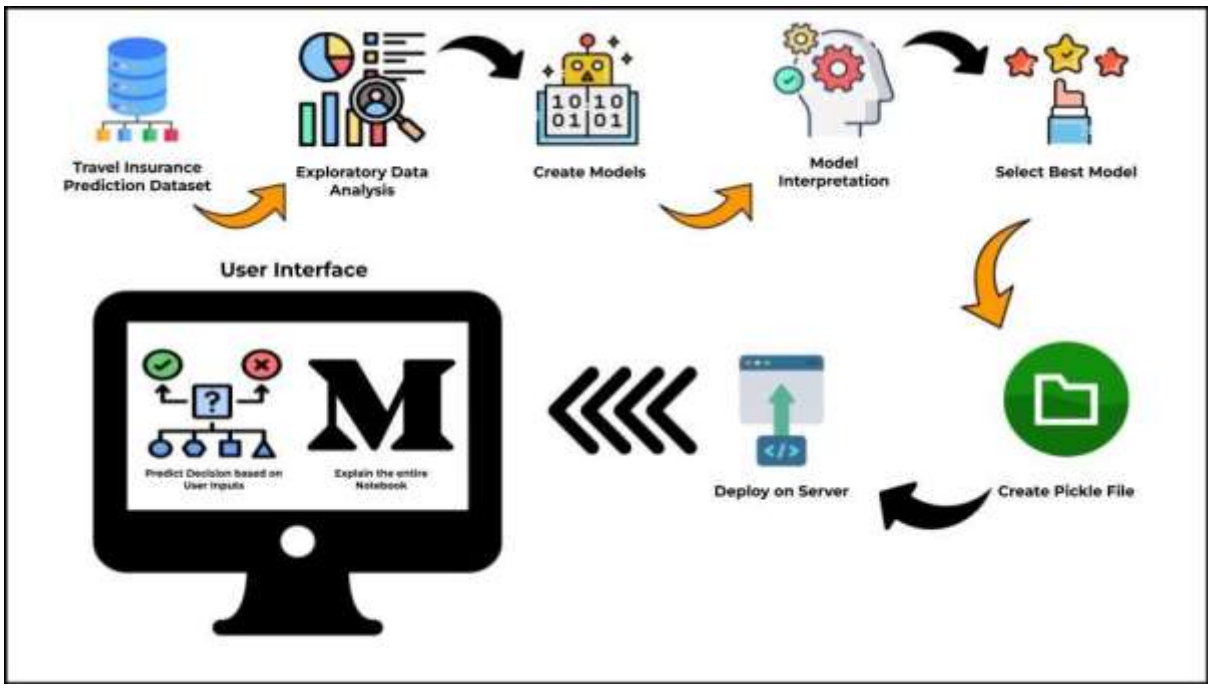
Evaluation Metrics: Investigate appropriate evaluation metrics (e.g., accuracy, precision, recall, F1-score, ROC-AUC) for assessing model performance based on the project's objectives.

5.Deployment and Monitoring:

Deployment Investigation: Investigate the deployment process, including selecting the appropriate environment (e.g., cloud or on-premises) and integrating the model into the production system.

Monitoring: Investigate how to set up continuous monitoring of the deployed model's performance and conduct regular audits to ensure it continues to meet its objectives

5. FLOWCHART



6.RESULT

	Unnamed: 0	Age	Employment Type	GraduateOrNot	AnnualIncome	FamilyMembers	ChronicDiseases	FrequentFlyer	EverTravelledAbroad	TravelInsurance
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1	1	31	Private Sector/Self Employed	Yes	1250000	7	0	No	No	0
2	2	34	Private Sector/Self Employed	Yes	500000	4	1	No	No	1
3	3	28	Private Sector/Self Employed	Yes	700000	3	1	No	No	0
4	4	28	Private Sector/Self Employed	Yes	700000	8	1	Yes	No	0

0	0	31	Government Sector	Yes	400000	6	1	No	No	0
1	1	31	Private Sector/Self Employed	Yes	1250000	7	0	No	No	0
2	2	34	Private Sector/Self Employed	Yes	500000	4	1	No	No	1
3	3	28	Private Sector/Self Employed	Yes	700000	3	1	No	No	0
4	4	28	Private Sector/Self Employed	Yes	700000	8	1	Yes	No	0
5	5	25	Private Sector/Self Employed	No	1150000	4	0	No	No	0
6	6	31	Government Sector	Yes	1300000	4	0	No	No	0
7	7	31	Private Sector/Self Employed	Yes	1350000	3	0	Yes	Yes	1
8	8	28	Private Sector/Self Employed	Yes	1450000	6	1	Yes	Yes	1
9	9	33	Government Sector	Yes	800000	3	0	Yes	No	0
10	10	31	Government Sector	Yes	400000	9	1	No	No	0
11	11	26	Private Sector/Self Employed	Yes	1400000	5	0	Yes	Yes	1
12	12	32	Government Sector	Yes	850000	6	0	No	No	1
13	13	31	Government Sector	Yes	1500000	6	0	Yes	Yes	1
14	14	31	Government Sector	Yes	400000	3	0	No	No	0
15	15	34	Private Sector/Self Employed	Yes	700000	7	0	No	No	0
16	16	28	Private Sector/Self Employed	Yes	1150000	4	1	No	No	0
17	17	28	Private Sector/Self Employed	Yes	800000	7	0	No	No	1
18	18	29	Private Sector/Self Employed	Yes	1050000	5	1	No	No	1
19	19	34	Private Sector/Self Employed	Yes	1500000	2	0	Yes	Yes	1

	Unnamed: 0	Age	Employment Type	GraduateOrNot	AnnualIncome	FamilyMembers	ChronicDiseases	FrequentFlyer	EverTravelledAbroad	TravelInsurance
1967	1967	34	Private Sector/Self Employed	Yes	700000	3	1	No	No	0
1968	1968	28	Government Sector	Yes	300000	5	1	No	No	0
1969	1969	31	Private Sector/Self Employed	Yes	500000	4	1	No	No	0
1970	1970	29	Private Sector/Self Employed	Yes	500000	4	0	No	No	1
1971	1971	31	Private Sector/Self Employed	Yes	950000	5	0	No	No	0
1972	1972	28	Private Sector/Self Employed	Yes	800000	5	1	No	No	0
1973	1973	31	Private Sector/Self Employed	Yes	1350000	3	0	No	Yes	1
1974	1974	28	Private Sector/Self Employed	Yes	1200000	6	0	Yes	No	0
1975	1975	26	Private Sector/Self Employed	Yes	1400000	9	0	No	Yes	1
1976	1976	32	Government Sector	Yes	900000	6	0	No	No	0
1977	1977	25	Private Sector/Self Employed	No	1350000	6	0	No	Yes	1
1978	1978	34	Private Sector/Self Employed	Yes	700000	5	0	No	No	1
1979	1979	28	Private Sector/Self Employed	Yes	1100000	4	1	No	No	0
1980	1980	25	Private Sector/Self Employed	No	1150000	5	1	No	No	0
1981	1981	27	Government Sector	Yes	850000	3	0	No	No	1
1982	1982	33	Private Sector/Self Employed	Yes	1500000	4	0	Yes	Yes	1
1983	1983	28	Private Sector/Self Employed	Yes	1750000	5	1	No	Yes	0
1984	1984	28	Private Sector/Self Employed	Yes	1150000	6	1	No	No	0
1985	1985	34	Private Sector/Self Employed	Yes	1000000	6	0	Yes	Yes	1

	Age	Employment Type	GraduateOrNot	AnnualIncome	FamilyMembers	ChronicDiseases	FrequentFlyer	EverTravelledAbroad	TravelInsurance
0	31	Government Sector	Yes	400000	6	1	No	No	0
1	31	Private Sector/Self Employed	Yes	1250000	7	0	No	No	0
2	34	Private Sector/Self Employed	Yes	500000	4	1	No	No	1
3	28	Private Sector/Self Employed	Yes	700000	3	1	No	No	0
4	28	Private Sector/Self Employed	Yes	700000	8	1	Yes	No	0

	Age	AnnualIncome	FamilyMembers	ChronicDiseases	TravelInsurance
count	1987.000000	1.987000e+03	1987.000000	1987.000000	1987.000000
mean	29.650226	9.327630e+05	4.752894	0.277806	0.357323
std	2.913308	3.768557e+05	1.609650	0.448030	0.479332
min	25.000000	3.000000e+05	2.000000	0.000000	0.000000
25%	28.000000	6.000000e+05	4.000000	0.000000	0.000000
50%	29.000000	9.000000e+05	5.000000	0.000000	0.000000
75%	32.000000	1.250000e+06	6.000000	1.000000	1.000000
max	35.000000	1.800000e+06	9.000000	1.000000	1.000000

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 1   Employment Type      1987 non-null   object
 2   GraduateOrNot        1987 non-null   object
 3   AnnualIncome         1987 non-null   int64 
 4   FamilyMembers        1987 non-null   int64 
 5   ChronicDiseases      1987 non-null   int64 
 6   FrequentFlyer        1987 non-null   object
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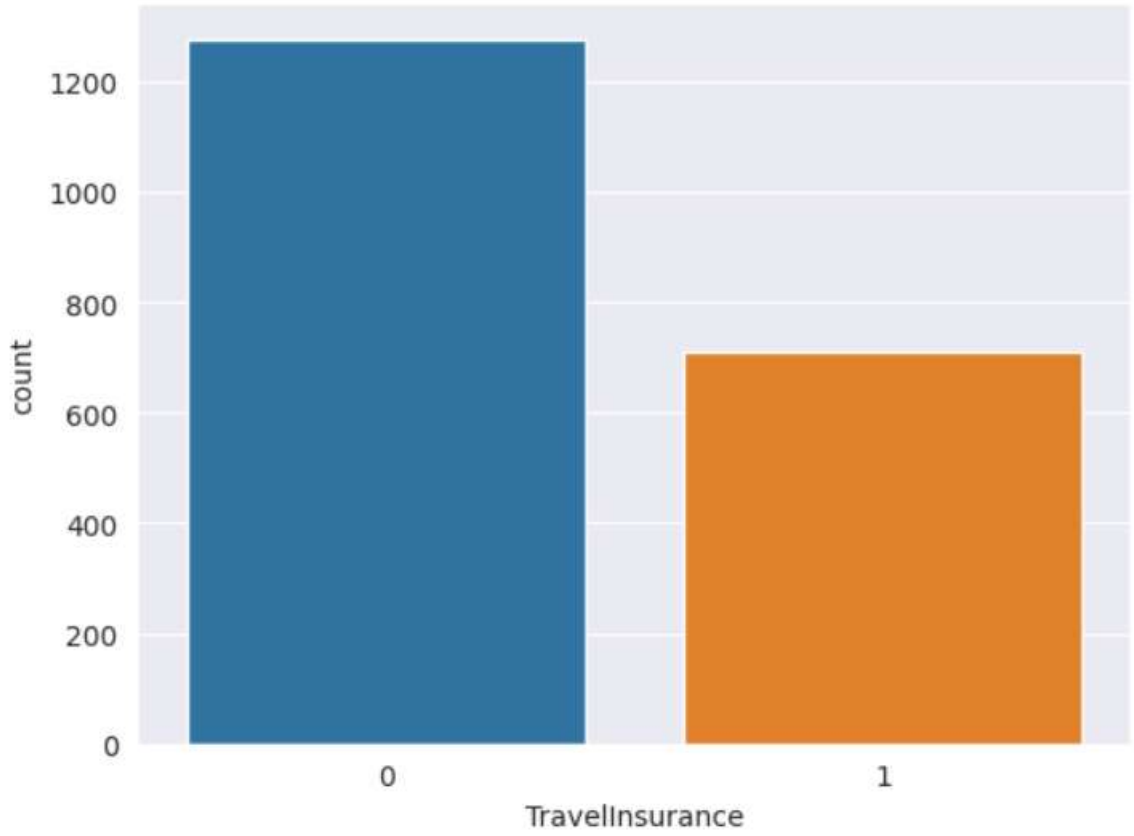


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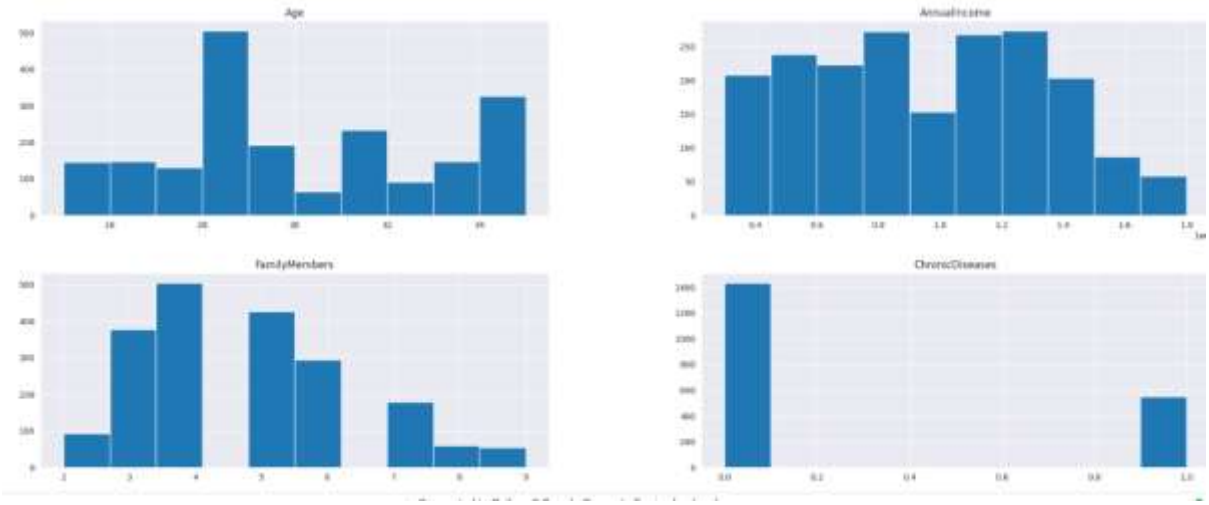

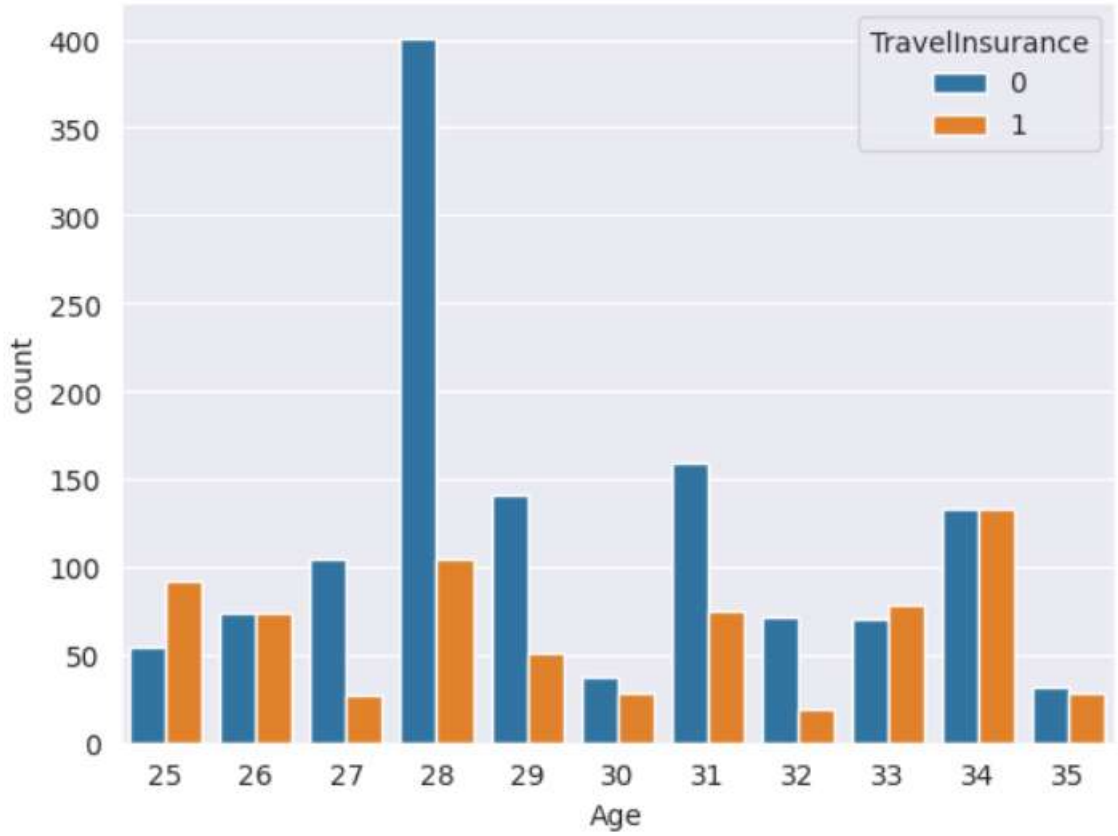
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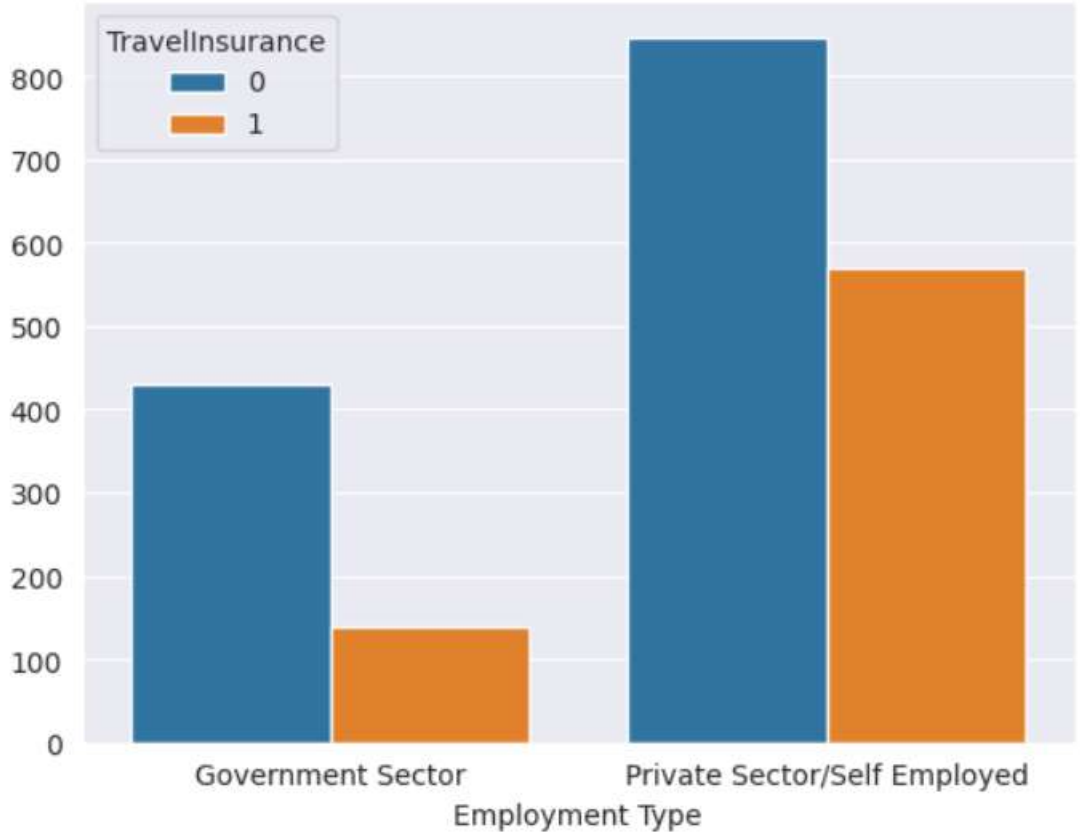
1
count
400
350
300
250
200
150
100
50
0
25
26
27
28
29
30
31
32
33
34
35
Age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500
400
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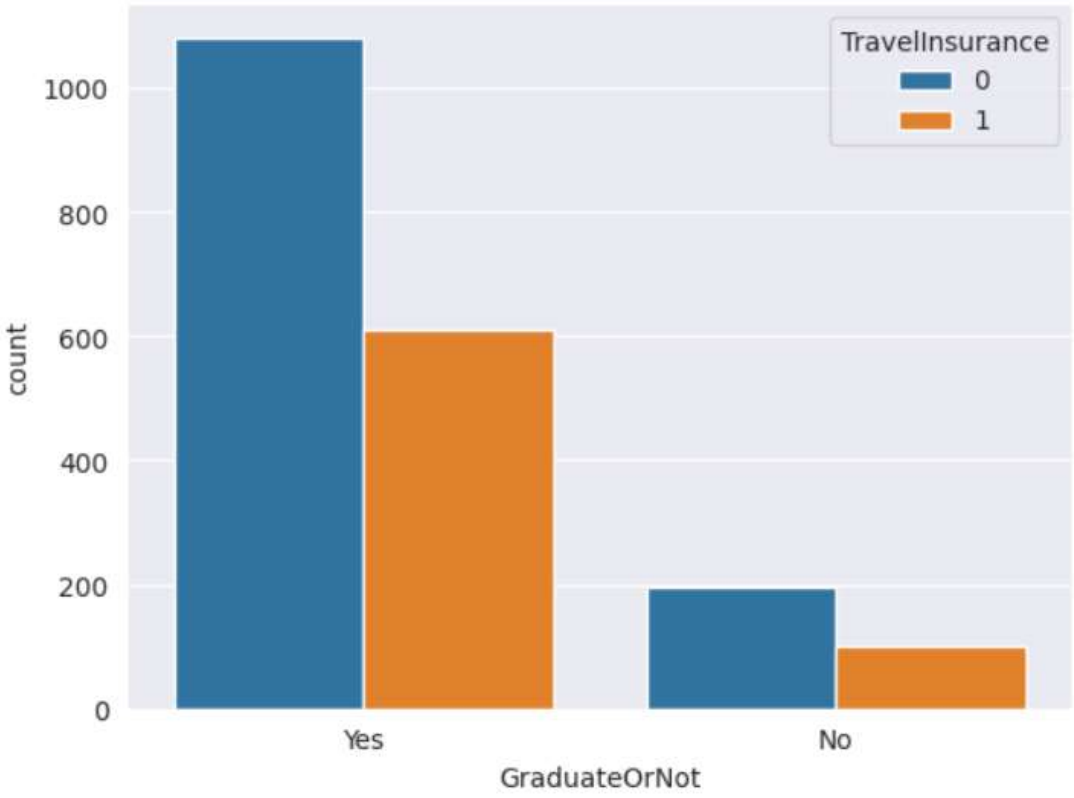
200
100
0
Government Sector
Private Sector/Self Employed
Employment Type


TravelInsurance
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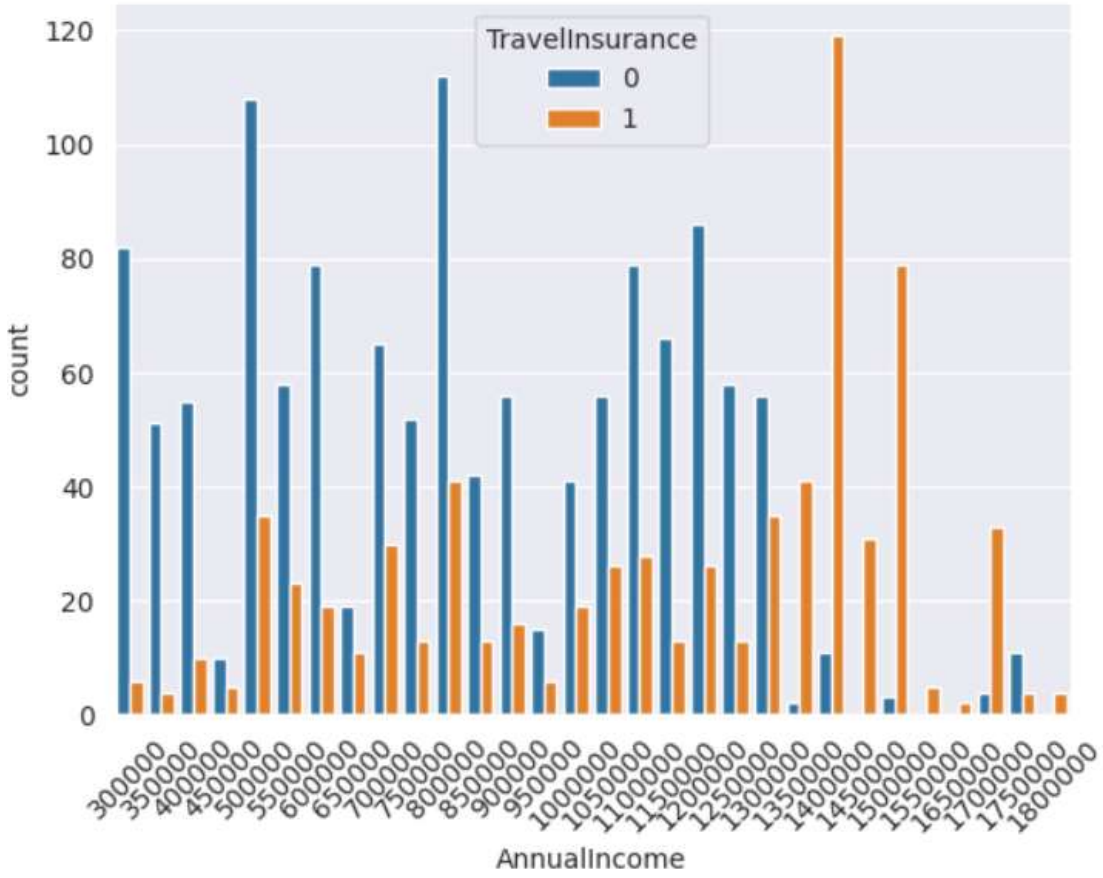
1000
800
600
400
200
0
count
Yes
No
GraduateOrNot


TravelInsurance
0
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100
80
60
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20
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count
300000
350000
400000
450000
500000
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1700000
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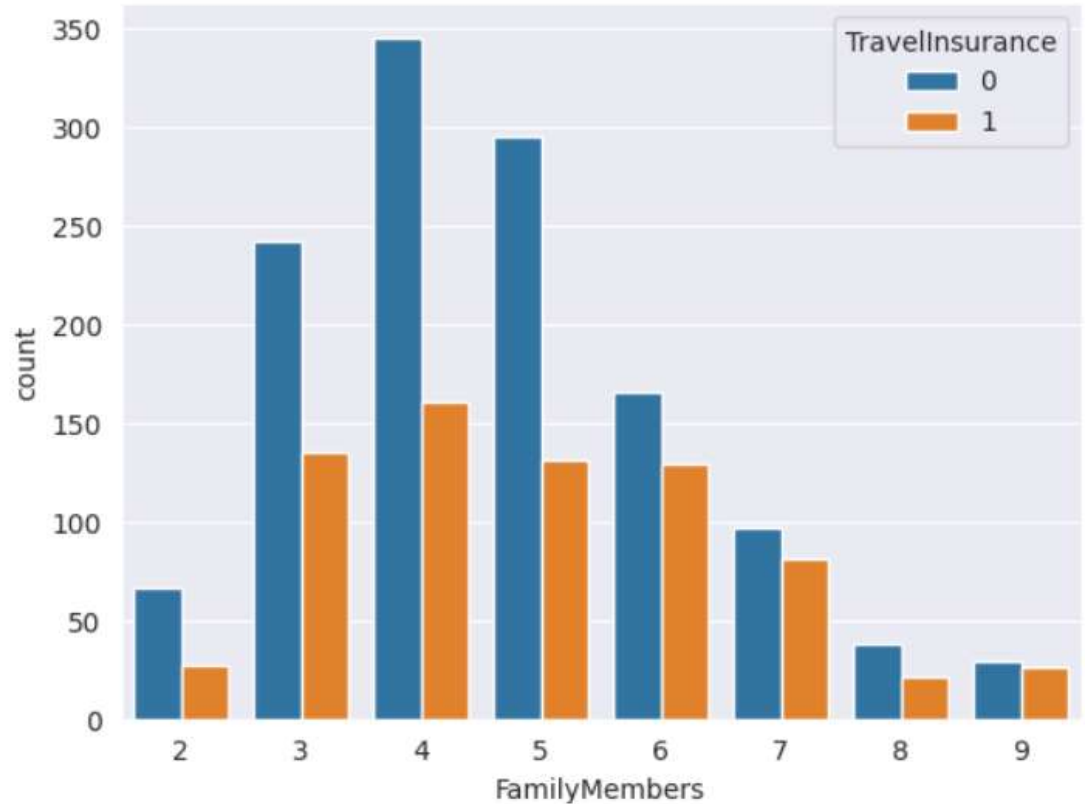
1800000
AnnualIncome


TravelInsurance
0
1
350
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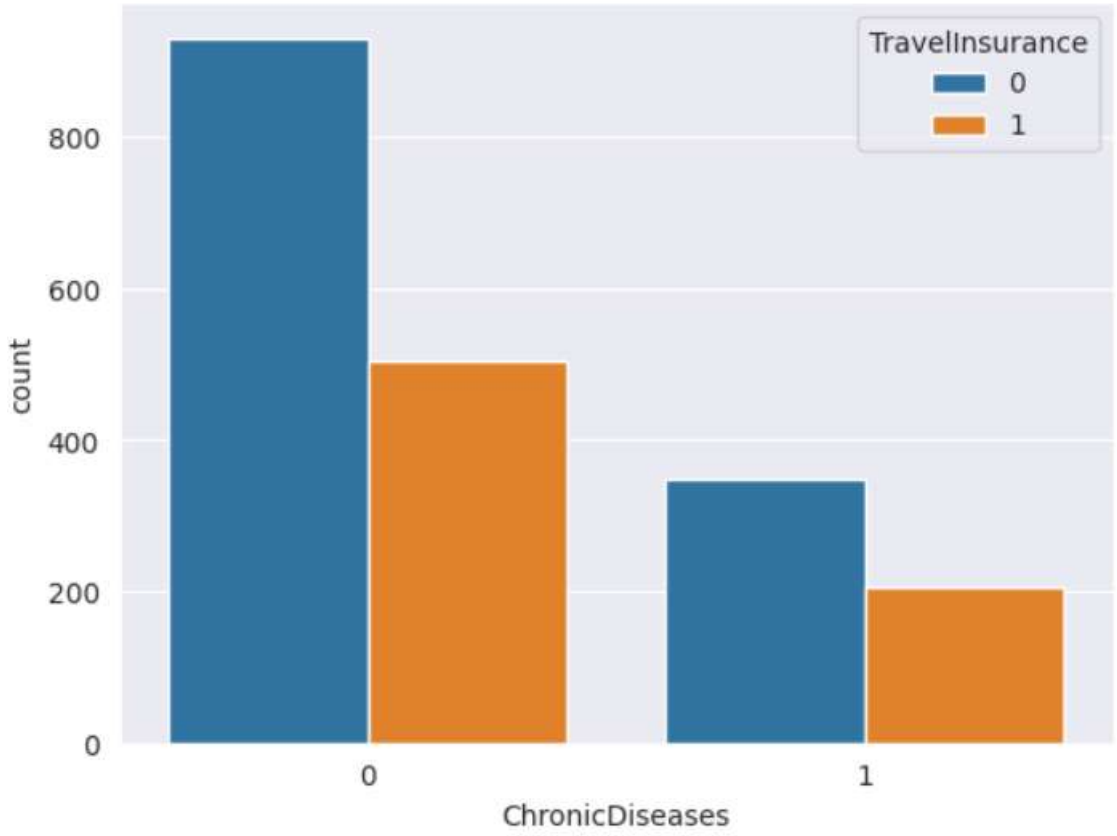
250
200
150
100
50
0
count
2
3
4
5
6
7
8
9
FamilyMembers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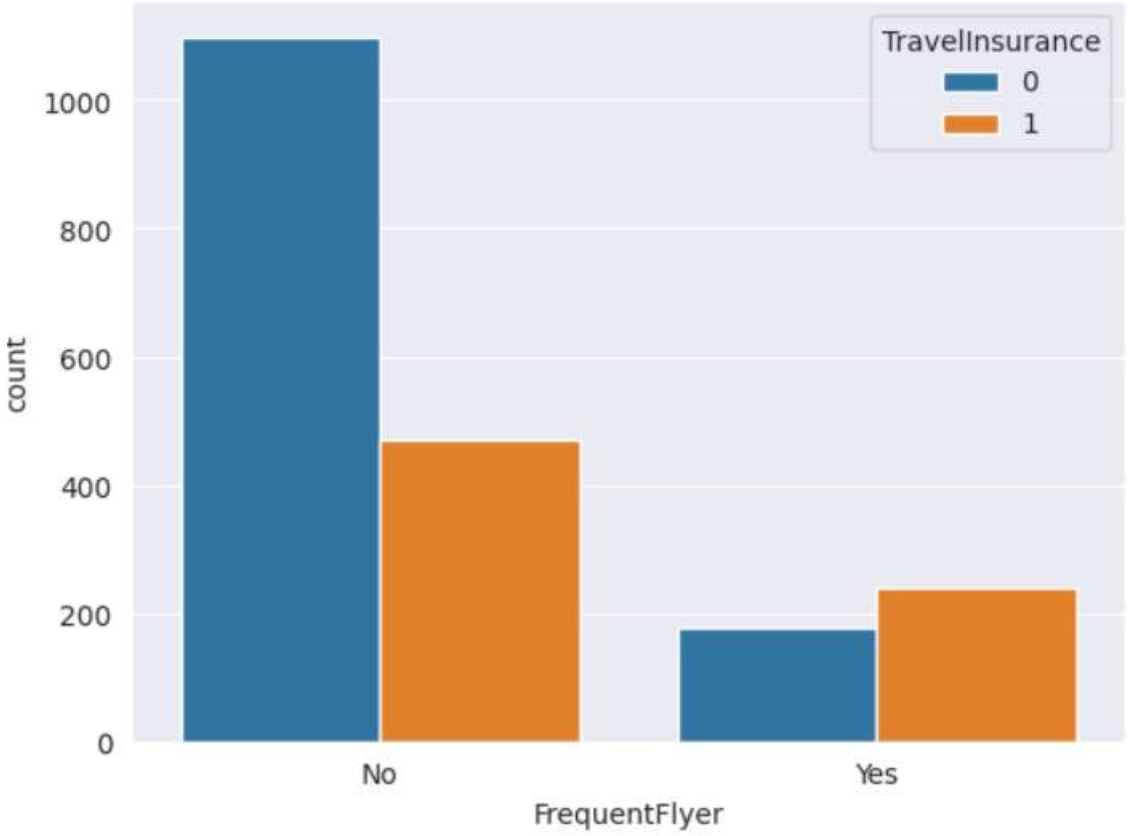
800
600
400
200
0
count
0
1
ChronicDiseases


TravelInsurance
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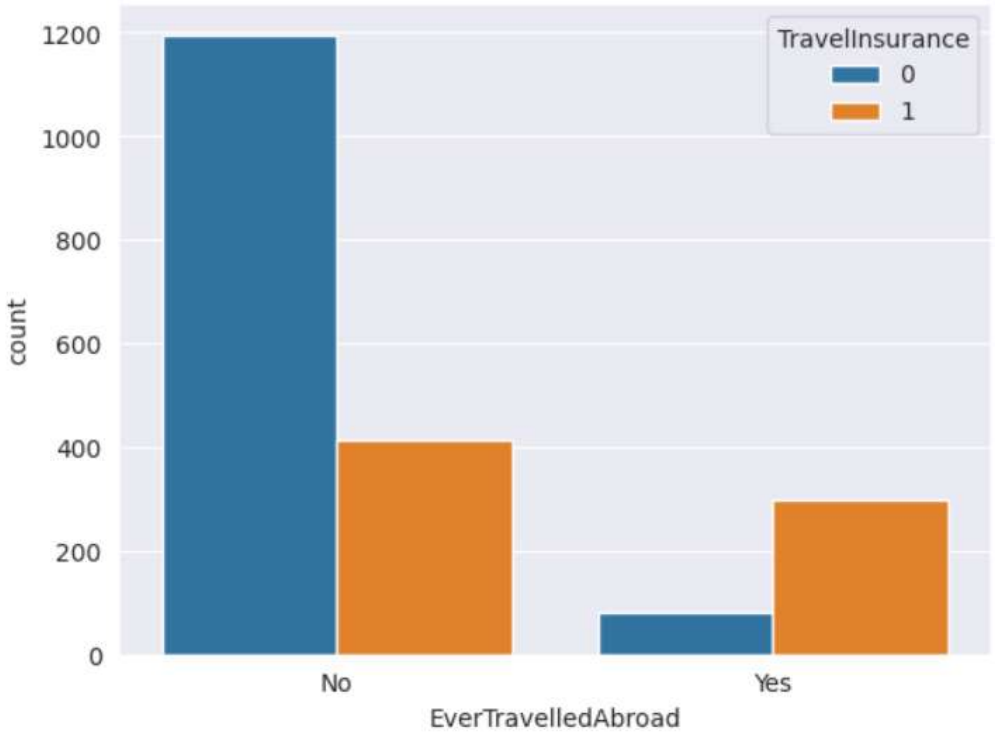
1
1000
800
600
400
200
0
count
No
Yes
FrequentFlyer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400
200
0
count
No
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EverTravelledAbroad


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 ('FamilyMembers', 0.19364467930007065)]
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1	SVM	0.820311
2	LR	0.663758
3	DT	0.778580
4	GNB	0.753863
5	RF	0.783102
6	GB	0.833907

```
   Age  AnnualIncome  FamilyMembers  ChronicDiseases  Government Sector  \
0   31        400000              6                1                  1
1   31       1250000              7                0                  0
2   34        500000              4                1                  0
3   28        700000              3                1                  0
4   28        700000              8                1                  0

   Private Sector/Self Employed  No  Yes  No  Yes  No  Yes
0                             0   0    1   1    0   1    0
1                             1   0    1   1    0   1    0
2                             1   0    1   1    0   1    0
3                             1   0    1   1    0   1    0
4                             1   0    1   0    1   1    0
```

```
   TravelInsurance
0                0
1                0
2                1
3                0
4                0

(1987, 12)
(1987, 1)
```

	Age	AnnualIncome	FamilyMembers	ChronicDiseases	TravelInsurance	Government Sector	Private Sector/Self Employed	No	Yes	No	Yes	No	Yes
0	31	400000	6	1	0	1	0	0	1	1	0	1	0
1	31	1250000	7	0	0	0	1	0	1	1	0	1	0
2	34	500000	4	1	1	0	1	0	1	1	0	1	0
3	28	700000	3	1	0	0	1	0	1	1	0	1	0
4	28	700000	8	1	0	0	1	0	1	0	1	1	0

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7. ADVANTAGES & DISADVANTAGES

Advantages:

Travel insurance prediction offers several advantages for both insurance companies and travelers. These advantages contribute to more efficient and customer-centric insurance services.

1. **Improved Risk Assessment:**
    - Travel insurance prediction models enhance insurers' ability to assess risks accurately. By analyzing various factors, including traveler profiles, trip details, and historical data, insurers can better understand the likelihood of claims, allowing for more precise pricing and risk management.
2. **Optimized Premium Pricing:**
    - Predictive models help insurance companies set appropriate premium rates based on risk profiles. Travelers benefit from fairer pricing that aligns with their individual risk factors, potentially leading to cost savings for low-risk travelers.
3. **Fraud Detection and Prevention:**
    - Advanced analytics and machine learning in travel insurance prediction assist in identifying fraudulent claims more effectively. This reduces the financial impact of fraudulent activities and helps maintain the integrity of the insurance system.
4. **Personalized Insurance Products:**
    - By segmenting customers based on their risk profiles and preferences, insurers can offer personalized insurance products. This enhances the customer experience and ensures that travelers receive coverage tailored to their specific needs.
5. **Enhanced Customer Experience:**
    - Travelers benefit from a more streamlined and efficient insurance purchasing process. They can access quotes and purchase policies more quickly, making it easier to secure coverage for their trips.
6. **Cost Savings:**
- By accurately assessing risk and detecting fraud, insurance companies can reduce their claims payouts and operational costs. These cost savings may be passed on to customers through competitive pricing.

Disadvantages:

1. **Data Privacy Concerns:**
    - The collection and analysis of personal data for predictive modeling raise privacy concerns. Travelers may be uncomfortable with the extent to which insurers use their data for risk assessment and pricing.
2. **Ethical Considerations:**
    - The use of predictive models in insurance can lead to ethical dilemmas. For instance, there may be concerns about discrimination or bias in risk assessments, leading to unfair treatment of certain groups of travelers.

3. **Accuracy Limitations:**
    - Predictive models are based on historical data and assumptions. They may not always accurately predict future events, especially for rare or unprecedented situations like global pandemics or geopolitical crises.

4 Model Complexity:

- Building and maintaining complex predictive models can be resource-intensive. Smaller insurance companies or those with limited technical capabilities may struggle to implement and manage such systems.
-
    - perceive them as a threat to their role in the sales process.

5.Data Quality Issues:

- Data used for predictive modeling must be accurate and up-to-date. Inaccurate or incomplete data can lead to flawed predictions.
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- **Complexity for Small Insurers:**
    - Smaller insurance companies may lack the resources and technical expertise to implement and maintain sophisticated predictive models.

8. APPLICATIONS

Risk Assessment:

- Predicting the likelihood of a traveler filing a claim based on various factors such as age, destination, travel duration, and past travel history. This helps insurance companies understand the risk associated with each policyholder.
- **Fraud Detection:**
    - Identifying suspicious or potentially fraudulent claims using predictive analytics. This involves analyzing claim data, customer behavior, and historical fraud patterns to flag potentially fraudulent activities.
- **Customer Segmentation:**
    - Segmenting policyholders into different groups based on their risk profiles and preferences. This allows insurance companies to offer customized insurance products and pricing to different customer segments, such as frequent travelers, families, or business travelers.
- **Policy Recommendation:**
    - Recommending insurance policies tailored to a traveler's specific needs and trip details. Predictive models can suggest coverage options that align with the traveler's destination, activities, and potential risks.
- **Real-time Risk Assessment:**
    - Providing real-time risk assessments for travelers based on changing conditions such as weather, political stability, or health advisories. Travelers can receive alerts and advice to mitigate risks during their trips.
- **Claims Processing Automation:**
    - Automating the assessment of insurance claims using predictive models. This streamlines claims processing, reduces turnaround times, and minimizes the need for manual reviews of straightforward claims.

Travel Advisory Services:

- Providing travelers with personalized travel advisories and recommendations based on their destination, travel dates, and potential risks. Predictive models can help travelers make informed decisions about their trips.

9.CONCLUSION

In conclusion, a travel insurance prediction project offers significant advantages for both insurance companies and travelers. By harnessing the power of data analytics and predictive modeling, this project aims to enhance the entire travel insurance ecosystem, from risk assessment and pricing optimization to fraud detection and customer experience enhancement.

impossible for the sales person in the travel agency to assess whether a customer would be likely to purchase travel insurance with his/her travel package. With the white box models performing significantly less accurately, it is thus recommended that the IT system of the travel agency be enhanced to run the model backend as part of the point of sale system or to train the staff to run the model as part of their sales process.

10. FUTURE SCOPE

The future of travel insurance prediction projects is expected to be shaped by various technological, regulatory, and industry trends. Here are some future predictions for travel insurance prediction projects:

1. **Integration of Real-time Data:** Travel insurers will increasingly rely on real-time data sources, such as weather updates, flight schedules, and geopolitical events, to provide travelers with up-to-the-minute risk assessments and coverage recommendations. This will enable insurers to adapt rapidly to changing travel conditions and offer more relevant coverage options.
2. **AI and Machine Learning Advancements:** Advancements in AI and machine learning techniques will lead to even more accurate risk assessments and predictive models. Deep learning algorithms, natural language processing, and reinforcement learning will become more prominent in the analysis of travel-related data.
3. **Personalized Coverage Recommendations:** Travel insurance will become highly personalized, with predictive models tailoring coverage recommendations to individual travelers' profiles, preferences, and itineraries. Travelers will have the option to select coverage that aligns precisely with their unique needs.
4. **Enhanced Fraud Detection:** Predictive models for fraud detection will become more sophisticated, incorporating anomaly detection, network analysis, and social network analysis to identify fraudulent activities more effectively.

11.BIBILOGRAPHY

References of previous works or websites visited/books referred for analysis about the project, solution previous findings etc.

APPENDIX
A. Source Code
Attach the code for the solution built.

Templates

Index.html

```
<!DOCTYPE html>
<html>
<head>
    <title>Travel Insurance Prediction</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #f4f4f4;
            text-align: center;
            margin: 0;
            padding: 0;
        }
        h1 {
            background-color: #007BFF;
            color: #fff;
            padding: 20px;
            margin: 0;
        }
        form {
            background-color: #fff;
            padding: 20px;
            border-radius: 10px;
            box-shadow: 0 0 10px rgba(0, 0, 0, 0.1);
            width: 80%;
            max-width: 400px;
            margin: 0 auto;
        }
        label {
            display: block;
            margin: 10px 0;
            font-weight: bold;
```

```
        }
        input[type="text"], select {
            width: 100%;
            padding: 10px;
            border: 1px solid #ccc;
            border-radius: 5px;
        }
        select {
            background-color: #f9f9f9;
        }
        input[type="submit"] {
            background-color: #007BFF;
            color: #fff;
            padding: 10px 20px;
            border: none;
            border-radius: 5px;
            cursor: pointer;
        }
        p {
            margin: 20px 0;
            font-weight: bold;
            color: #007BFF;
        }
    </style>
</head>
<body>
    <h1>Travel Insurance Prediction</h1>

    <form method="POST" action="/predict">
        <label for="Age">Age:</label>
        <input type="text" name="Age" required><br>

        <label for="EmploymentType">Employment Type:</label>
        <select name="EmploymentType">
            <option value="Private Sector/Self Employed">Private Sector/Self
Employed</option>
            <option value="Government Sector">Government Sector</option>
        </select><br>

        <label for="AnnualIncome">Annual Income:</label>
        <input type="text" name="AnnualIncome" required><br>

        <label for="FamilyMembers">Family Members:</label>
        <input type="text" name="FamilyMembers" required><br>

        <label for="ChronicDiseases">Chronic Diseases:</label>
        <select name="ChronicDiseases">
            <option value="Yes">Yes</option>
```

```
            <option value="No">No</option>
        </select><br>

        <label for="FrequentFlyer">Frequent Flyer:</label>
        <select name="FrequentFlyer">
            <option value="Yes">Yes</option>
            <option value="No">No</option>
        </select><br>

        <label for="EverTravelledAbroad">Ever Travelled Abroad:</label>
        <select name="EverTravelledAbroad">
            <option value="Yes">Yes</option>
            <option value="No">No</option>
        </select><br>

        <label for="GraduateOrNot">Are you a graduate?</label>
        <select name="GraduateOrNot" id="GraduateOrNot">
            <option value="Yes">Yes</option>
            <option value="No">No</option>
        </select>

        <input type="submit" value="Predict">
    </form>

    {% if prediction_text %}
        <p>Prediction: {{ prediction_text }}</p>
    {% endif %}

</body>
</html>
```

app.py

```
import joblib
from flask import Flask, render_template, request

app = Flask(__name__)

# Load the trained machine learning model
model = None

# Load your training data and train the model
def load_model_and_data():
```

```
    global model
    if model is None:
        model = joblib.load('Travel.pkl')

@app.before_request
def before_request():
    load_model_and_data()

@app.route('/')
def home():
    return render_template('index.html')

@app.route('/predict', methods=['POST'])
def predict():
    Age = int(request.form['Age'])
    EmploymentType = request.form['EmploymentType']
    GraduateOrNot = request.form['GraduateOrNot']
    AnnualIncome = int(request.form['AnnualIncome'])
    FamilyMembers = int(request.form['FamilyMembers'])
    ChronicDiseases = request.form['ChronicDiseases']
    FrequentFlyer = request.form['FrequentFlyer']
    EverTravelledAbroad = request.form['EverTravelledAbroad']
    print(FrequentFlyer,EverTravelledAbroad,ChronicDiseases,EmploymentType)
    # Encode categorical variables
    # EmploymentType_encoded = 1 if EmploymentType == 'Private Sector/Self
Employed' else 0
    # FrequentFlyer_encoded = 1 if FrequentFlyer == 'Yes' else 0
    # EverTravelledAbroad_encoded = 1 if EverTravelledAbroad == 'Yes' else 0

    # Create a list of features in the same order as the model expects
    features = [Age, EmploymentType, GraduateOrNot, AnnualIncome,
FamilyMembers, ChronicDiseases, FrequentFlyer, EverTravelledAbroad]
    print(features)
    # Make a prediction using the loaded and trained model
    prediction = model.predict(features)
    if prediction == 1:
        prediction_text = 'Yes'
    else:
        prediction_text = 'No'

    return render_template('index.html', prediction_text=prediction_text)


if __name__ == "__main__":
    app.run(debug=True)
```