AUTOMATING E- GOVERNMENCE SERVICES USING MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE

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ABSTRACT

In this paper author describing concept to predict insurance policies charges and user opinion sentiment on policies by applying machine learning and artificial intelligence. Machine learning can automatically predict future values by analyzing past historic data and artificial intelligence will take decision as human brain (as our brain help us in making decision as word hard if marks is less else take easy). Here also by analyzing male and female BMI index AI and machine learning will predict insurance policy and its charges. This AI and ML can also analyze user's opinions or reviews and then it will take decision as whether person's opinion is positive, negative or neutral.

1. INTRODUCTION

Artificial Intelligence (AI) has been around for some decades in several theoretical forms and complicated systems; however, only recent advances in computational powers and big data have enabled AI to achieve outstanding results in an ever-growing number of domains. For example, AI have tremendously advanced the areas of computer vision [1], medical applications, natural language processing, reinforcement learning, and several other domains.

AI can be defined as the ability of a computer to imitate the intelligence of human behavior while improving its own performance. AI is not only robotics, rather an intelligent behavior of an autonomous machine that describes the brain of the machine and not its body; it can drive a car, play a game, and perform diverse sophisticated jobs. AI is a field that falls at the intersections of several other domains, including Machine Learning, Deep Learning, Natural Languages Processing [3], Context Awareness [7], and Data Security and Privacy illustrates the intersections and relationship of the AI field with related fields.

Machine Learning (ML) is the ability of an algorithm to learn from prior data in order to produce a smart behavior and make correct decisions in various situations that it has never faced before. ML algorithms are enabled by training a computational model, which is the process of exposing an algorithm to a large dataset (e.g., citizens' demographics) in order to predict future behaviors (e.g., employment rates). The process of learning from prior datasets is known as a supervised learning.

Unlike traditional ML algorithms, Deep Learning, a sub-field of ML, has emerged to outcome the limitations of prior ML algorithms. Deep learning can be defined as a mapping function that maps raw input data (e.g., a medical image) to the desired output (e.g., diagnosis) by minimizing a loss function using some optimization approach, such as stochastic gradient descent (SGD) [9]. Deep learning algorithms, inspired by the neural networks in the human brain, are built with a large number of hierarchical artificial neural networks that map the raw input data (inserted at the input layer) to the desired output (produced at the output layer) through a large number of layers (known as hidden layers), and thus the name deep learning. The hidden layers are responsible for the actual mapping process, which is a series of simple but nonlinear mathematical operations (i.e., a

dot product followed by a nonlinear process). The main advantage of deep learning is that it does not require feature engineering.

2. LITERATURE SURVEY AND RELATED WORK

1. Seven-layer deep neural network based on sparse autoencoder for voxel wise detection of cerebral microbleed. In order to detect the cerebral microbleed (CMB) voxels within brain, we used susceptibility weighted imaging to scan the subjects. Then, we used under sampling to solve the accuracy paradox caused from the imbalanced data between CMB voxels and non-CMB voxels. we developed a seven-layer deep neural network (DNN), which includes one input layer, four sparse autoencoder layers, one soft Max layer, and one output layer. Our simulation showed this method achieved a sensitivity of 95.13%, a specificity of 93.33%, and an accuracy of 94.23%. The result is better than three state-of-the-art approaches.

2. Translating videos to natural language using deep recurrent neural network

Solving the visual symbol grounding problem has long been a goal of artificial intelligence. The field appears to be advancing closer to this goal with recent breakthroughs in deep learning for natural language grounding in static images. In this paper, we propose to translate videos directly to sentences using a unified deep neural network with both convolutional and recurrent structure. Described video datasets are scarce, and most existing methods have been applied to toy domains with a small vocabulary of possible words. By transferring knowledge from 1.2M+ images with category labels and 100,000+ images with captions, our method is able to create sentence descriptions of open-domain videos with large vocabularies. We compare our approach with recent work using language generation metrics, subject, verb, and object prediction accuracy, and a human evaluation.

3. Mastering the game of Go with deep neural networks and tree search

The game of Go has long been viewed as the most challenging of classic games for artificial intelligence owing to its enormous search space and the difficulty of evaluating board positions and moves. Here we introduce a new approach to computer Go those uses 'value networks' to evaluate board positions and 'policy networks' to select moves. These deep neural networks are trained by a novel combination of supervised learning from human expert games, and reinforcement learning from games of self-play. Without any lookahead search, the neural networks play Go at the level of state-of-the-art Monte Carlo tree search programs that simulate thousands of random games of self-play. We also introduce a new search algorithm that combines Monte Carlo simulation with value and policy networks. Using this search algorithm, our program AlphaGo achieved a 99.8% winning rate against other Go programs, and defeated the human European Go champion by 5 games to 0. This is the first

time that a computer program has defeated a human professional player in the full-sized game of Go, a feat previously thought to be at least a decade away.

4. Pattern Recognition and Machine Learning

First text on pattern recognition to present the Bayesian viewpoint, one that has become increasing popular in the last five years.

Presents approximate inference algorithms that permit fast approximate answers in situations where exact answers are not feasible First text to use graphical models to describe probability distributions. There are no other books that apply graphical models to machine learning. First four-color book on pattern recognition. The dramatic growth in practical applications for machine learning over the last ten years has been accompanied by many important developments in the underlying algorithms and techniques. For example, Bayesian methods have grown from a specialist niche to become mainstream, while graphical models have emerged as a general framework for describing and applying probabilistic techniques. The practical applicability of Bayesian methods has been greatly enhanced by the development of a range of approximate inference algorithms such as variational Bayes and expectation propagation, while new models based on kernels have had a significant impact on both algorithms and applications.

3. EXISTING SYSTEM

Recently, many countries have adopted e-government services in various departments and many autonomous applications. While there are several studies conducted for enhancing government services, only a few of them address utilizing recent advances in AI and deep learning in the automation of e-government services. Therefore, there is still an urgent need to utilize state-of-the-art AI techniques and algorithms to address e-government challenges and needs. In contrast, implementing e government applications still faces several challenges, including the following: Trust: trusting online services depends heavily on a couple of factors including, the citizens' trust in the government itself, the quality of the online services, and the people believes (e.g., there still a large number of citizens who prefer to handle paper applications rather than web services). Lack of experts: implementing high quality online services requires the establishment of the right team of experts that covers all involved practice areas from web development to security and privacy. Inaccessibility: several third world countries still face significant issues with accessing the internet and its services. Security: state-of-the-art security measures are required to secure e-government applications and the citizen's privacy.

4. PROPOSED SYSTEM

In this paper, the author describes the concept to automate government services with Artificial Intelligence techniques such as a Deep Learning algorithm called Convolution Neural Networks (CNN). Government can introduce new schemes on the Internet and people can read news and notifications of such schemes then people can write an opinion about such schemes and these opinions can help the government in taking better decisions. To detect public opinions about schemes automatically we need to have software like human brains that can easily understand the opinion that people are writing in favor of positive or negative. To build such automated opinion detection author is suggesting building CNN model which can work like human brains. This CNN model can be generated for any service and we can make it work like automated decision making without any human interactions. To suggest this technique author already describes the concept to implement multiple models in which one model can detect or recognize human handwritten digits and the second model can detect sentiment from text sentences that can be given by humans about government schemes. In our extension model, we added another model which can detect sentiment from a person face image. Person face expressions can describe sentiments better than words or sentences. So our extension work can predict sentiments from personal face images.

5. METHODOLOGIES

MODULE

1.Add Product Details

To build project I used some sample products image to train product identification models.

2.Train Model

In this Module screen train model generated with 100% accuracy and now show product to web cam.

3. Add/Remove Product from basket

To allow application to identify product image and then show in text area and if we again show same product then application will remove from text area.

Modules Used in Project:

TensorFlow

TensorFlow is a free and open-source across a range of tasks. It is a symbolic math library, and is also used for machine learning applications such as neural networks. It is used for both research and production at Google.

TensorFlow was developed by the Google Brain team for internal Google use. It was released under the Apache 2.0 open-source license on November 9, 2015.

NumPy

NumPy is a general-purpose array-processing package. It provides a high-performance multidimensional array object, and tools for working with these arrays.

It is the fundamental package for scientific computing with Python. It contains various features including these important ones:

- A powerful N-dimensional array object
- Sophisticated (broadcasting) functions
- Tools for integrating C/C++ and Fortran code
- Useful linear algebra, Fourier transform, and random number capabilities

Besides its obvious scientific uses, NumPy can also be used as an efficient multi-dimensional container of generic data. Arbitrary data-types can be defined using NumPy which allows NumPy to seamlessly and speedily integrate with a wide variety of databases.

Pandas

Pandas is an open-source Python Library providing high-performance data manipulation and analysis tool using its powerful data structures. Python was majorly used for data munging and preparation. It had very little contribution towards data analysis. Pandas solved this problem. Using Pandas, we can accomplish five typical steps in the processing and analysis of data, regardless of the origin of data load, prepare, manipulate, model, and analyze. Python with Pandas is used in a wide range of fields including academic and commercial domains including finance, economics, Statistics, analytics, etc.

Matplotlib

Matplotlib is a Python 2D plotting library which produces publication quality figures in a variety of hardcopy formats and interactive environments across platforms. Matplotlib can be used in Python scripts, the Python and Python shells, the Jupyter Notebook, web application servers, and four graphical user interface toolkits. Matplotlib tries to make easy things easy and hard things possible. You can generate plots, histograms, power spectra, bar charts, error charts, scatter plots, etc., with just a few lines of code. For examples, see the sample plots and thumbnail gallery.

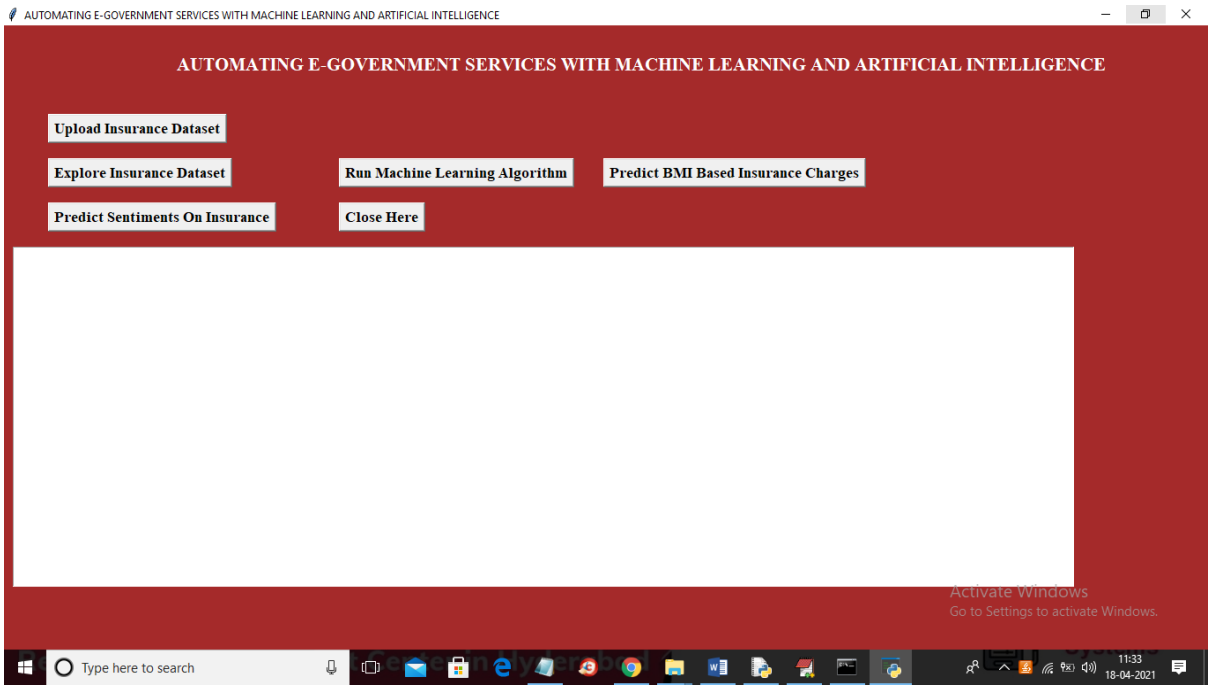
For simple plotting the pyplot module provides a MATLAB-like interface, particularly when combined with IPython. For the power user, you have full control of line styles, font properties, axes properties etc. via an object-oriented interface or via a set of **functions familiar to MATLAB users.**

Scikit – learn

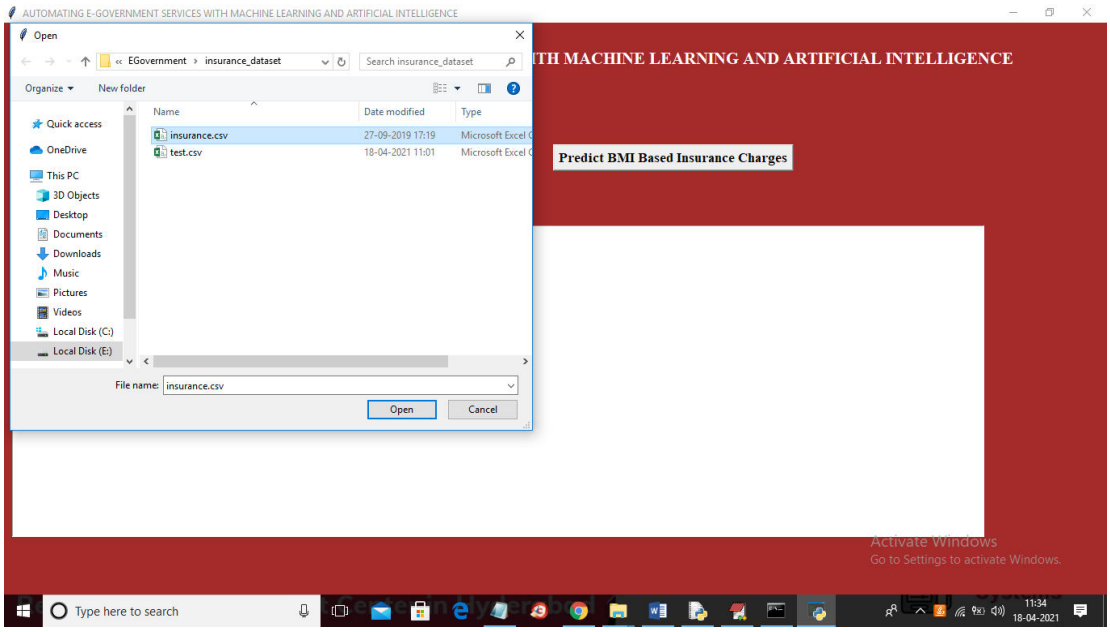
Scikit-learn provides a range of supervised and unsupervised learning algorithms via a consistent interface in Python. It is licensed under a permissive simplified BSD license and is distributed under many Linux distributions, encouraging academic and commercial use.

6. RESULTS AND DISCUSSION SCREEN SHOTS

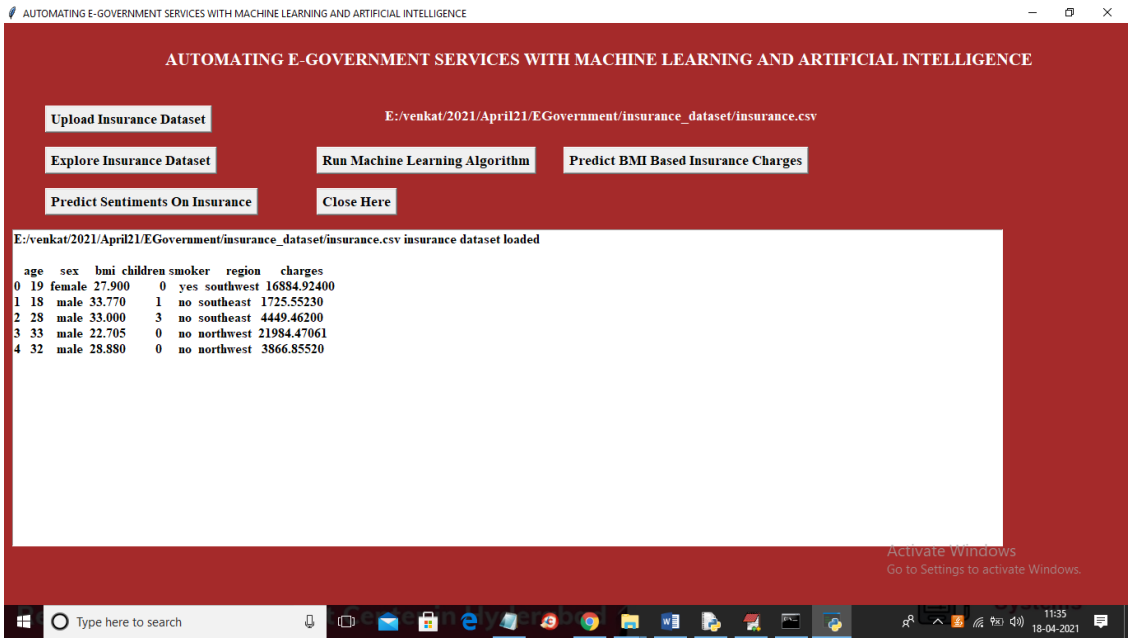
To run project double click on 'run.bat' file to get below screen



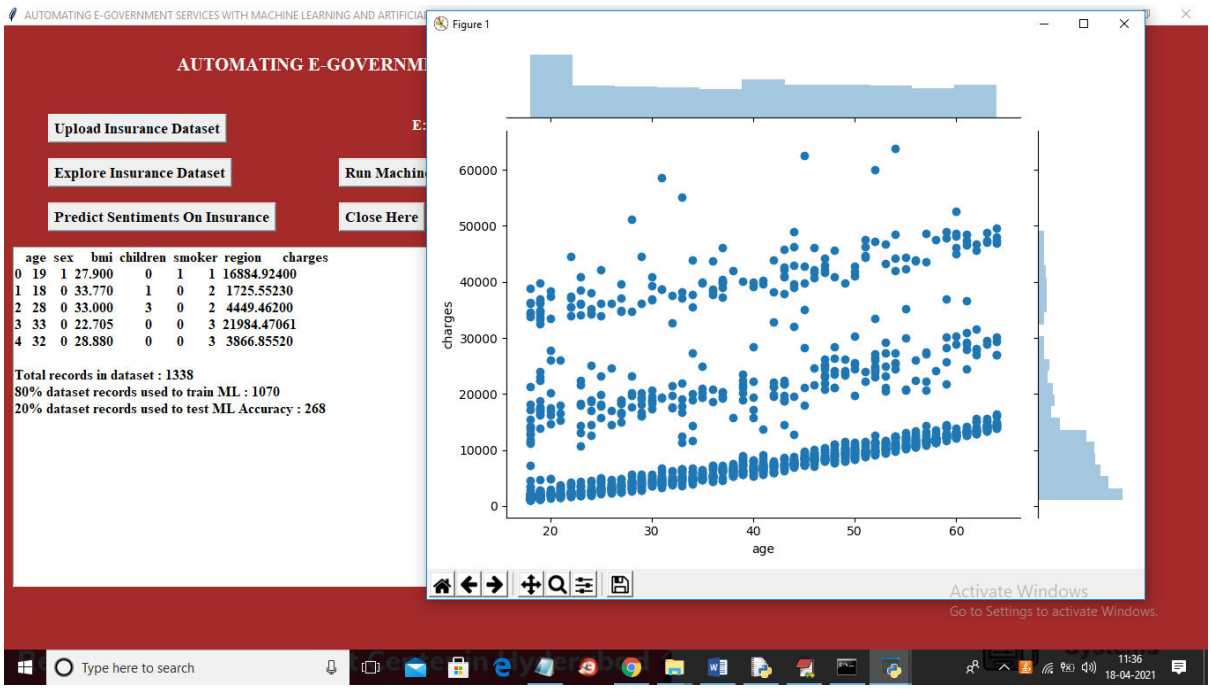
In above screen click on 'Upload Insurance Dataset' button and upload dataset



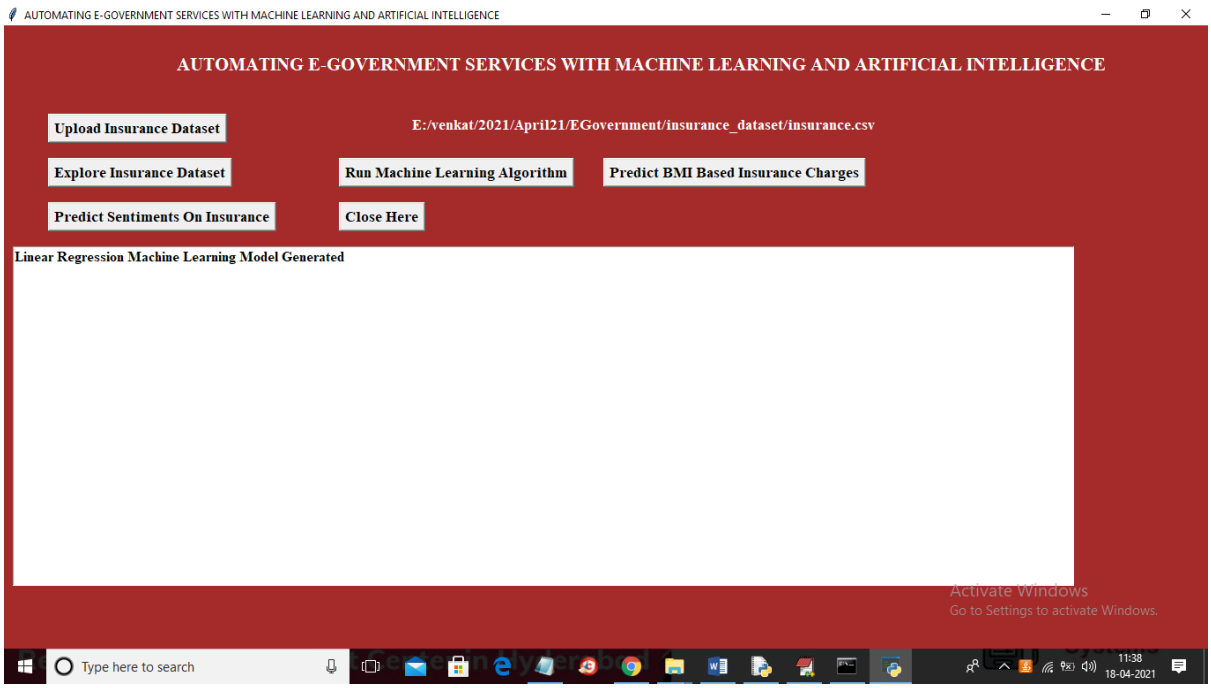
In above screen selecting and uploading "insurance.csv" file and the click on 'Open' button to load dataset and to get below screen



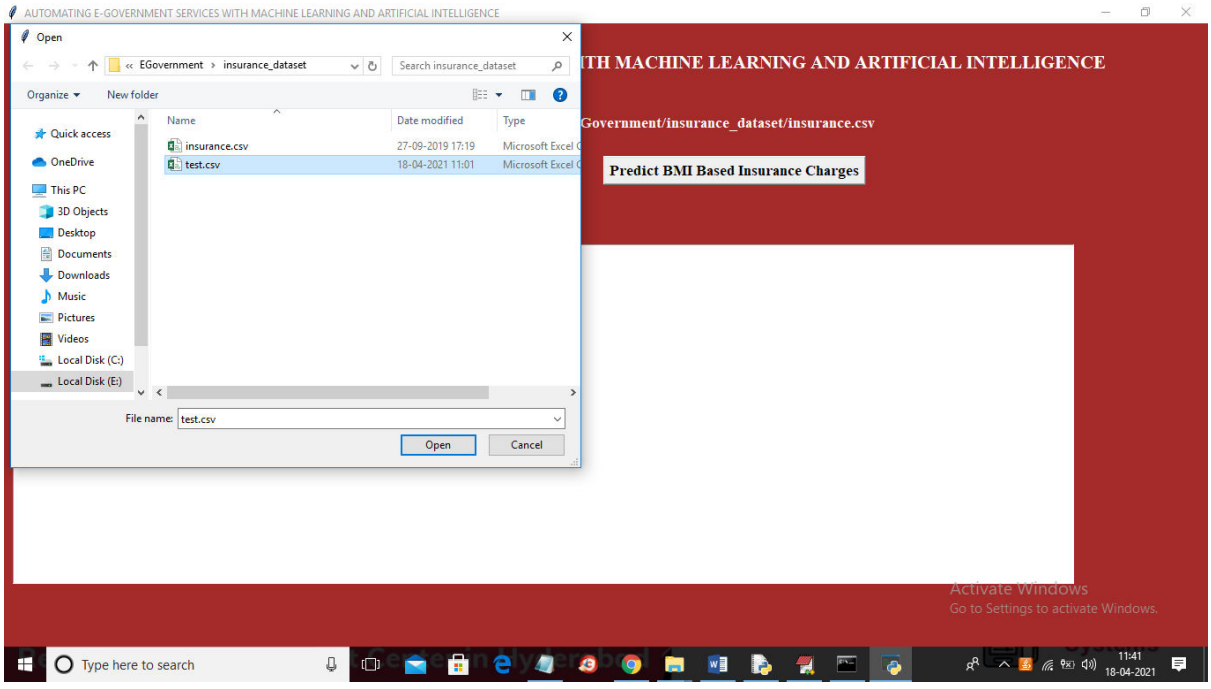
In above screen dataset loaded and we can see dataset contains some non-numeric values and ML will not take string value so we need to convert non-numeric string values to numeric by replacing male with 0 and female with 1. So, click on 'Explore Insurance Dataset' button to replace string with numeric values.



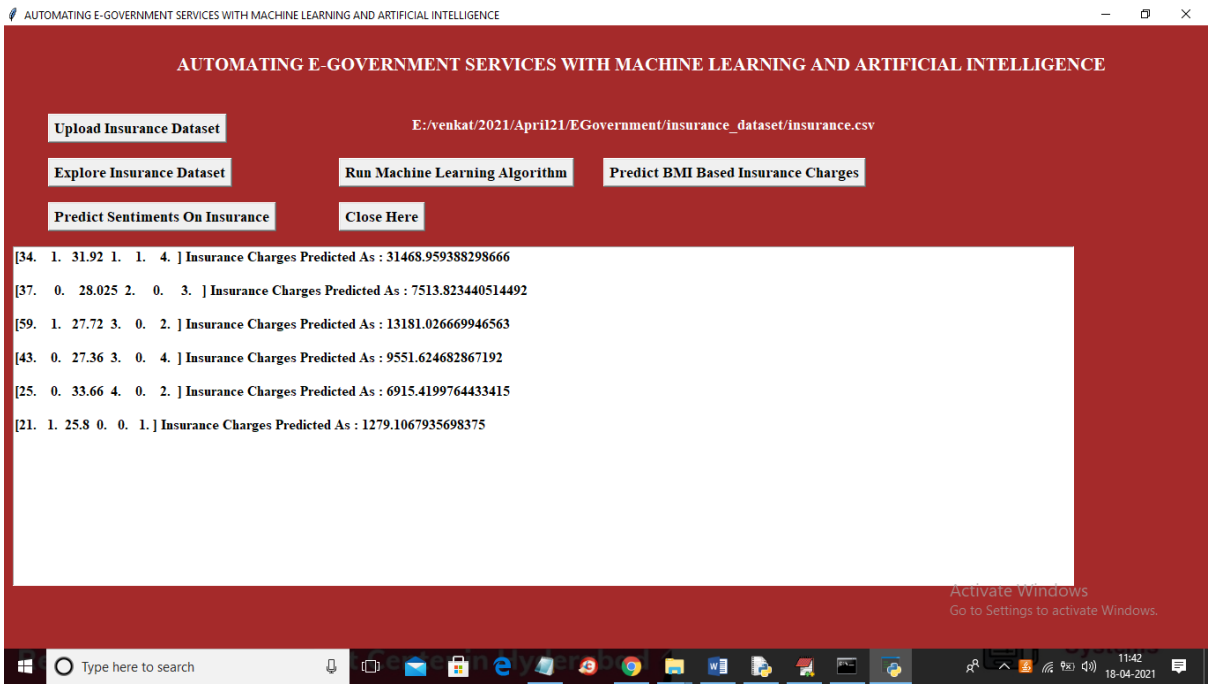
In above screen we can see all string values replace with numeric data and we can see dataset contains total 1338 records and application using 1070 records to train ML and 268 records to test ML performance and in above graph x-axis represents AGE and y-axis represents insurance charges and we can see in above graph when AGE increasing then insurance charges also increasing. Now dataset is ready and now click on 'Run Machine Learning Algorithm' button to build ML model



In above screen ML model generated and now click on 'Predict BMI Based Insurance Charges' button to upload test data and then ML will predict insurance policy and charges.



In above screen selecting and uploading 'test.csv' file and then click on 'Open' button to load test records and then ML and AI will analyze gender, smoking, BMI and then predict policy charges and will give below output



In above screen in square, bracket we can see test values and after square bracket we can see predicted policy charges. After seeing charges and policy user may express some opinion and then ML will predict sentiment from that opinion. So, click on 'Predict Sentiments on Insurance' button to express some reviews

7. CONCLUSION AND FUTURE SCOPE

With the recent advances in AI and machine learning technologies, more government agencies are starting to use such technologies to improve their systems and services. However, a large set of challenges hinder the adoption of such technologies, including the lack of experts, computational resources, trust, and AI interpretability.

In this paper we introduced the definitions of artificial intelligence and e-government, briefly discussed the current state of e-government indices around the world, and then proposed our solutions to advance the current state of e-government, considering the Gulf countries as a case study. We proposed a framework for management of government lifecycle end-td-end. Then, we proposed asset of machine learning and mac

hine learning techniques that can help facilitate and automate several e-government services. After that we proposed a smart platform for AI development and implementation in e-government.

The overarching goal of this project is to introduce new frameworks and platform to integrate recent advances in AI techniques in the e-government systems and services to improve the overall trust, transparency, and efficiency of e-government.

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