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Prediction Of Health Insurance Premium Costs With IBM Auto Ai Service

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***Abstract*--- In this project machine learning model is created to predict the insurance charges, and helps the customer understand how smoking or decreasing IBM which affects insurance premiums. IBM cloud is used as a host to complete and ML pipeline workloads be completely automated. The increase in growth in data science and AI. IBM is offering, Auto AI which can easily perform automated data preparation, apply ML algorithms, and build pipelines best suited for our datasets and calculate the insurance premium.**

***Index terms*--- Machine learning, Insurance Premium, Watson Studio, Flask.**

I. INTRODUCTION:

Artificial intelligence leverages computers and machines to mimic the problem-solving and decision-making capabilities of the human mind. It is related to the similar task of using computers to understand human intelligence, but AI does not have to confine itself to methods that are biologically observable. The use of artificial intelligence is increasingly used within the health care field and related to them. According to the reports, the value of gross insurance premium worldwide continue to increase past 5-6 trillion dollars and this increase or growth can be reduced by mainly quit smoking and concentrating on the BMI. Flask is an API of Python that allows to build up web-applications. It was developed by Armin Ronacher. Flask's framework is easy to learn because it has less base code to implement a simple web-Application. In this project, we study the effects of age, smoking, BMI, gender and region to determine how much of a difference these factors can make on your insurance premium. By making use of the concept of artificial intelligence and machine learning, which help customers understand that how much smoking increases their premium, by predicting the premium they has to pay in no time.

II. PROBLEM STATEMENT

At present the main existing problem in the insurance industry is that the companies are not customer friendly and also the customers don't know exactly the process of calculation of the insurance premium paid by them and also there is inefficiency in the calculation of insurance premium and also many claims are getting wrongly delivered. This is all due to the amount of work required to be processed manually often leads to inefficiency. Furthermore, an so many sum of tasks may cause mistakes that impact customer's lives.

III. PROPOSED SOLUTION

Using AI, we get solutions which are designed to automate, simplify and speed up the process of claims handling, which leads to increased customer satisfaction and cost savings in operations. AI-based applications are extremely effective in collecting and processing claims data, verifying and analysing them. With the help of AI, customer experience can be improved to so much extent.

IV. TOOLS REQUIREMENT SPECIFICATIONS:

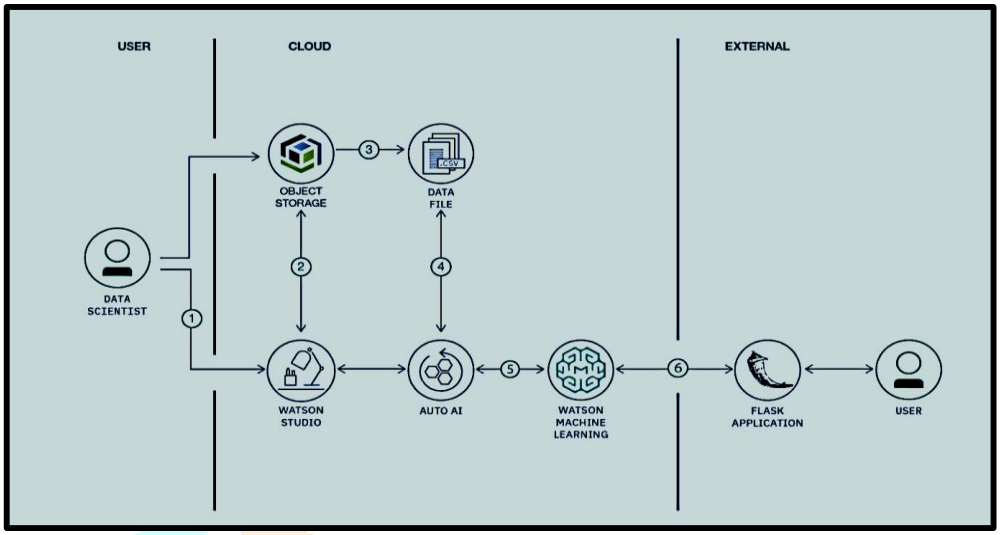
Software Requirements:

- Watson studio
- Flask from the IBM cloud.

Hardware Requirements:

Since we are using the IBM cloud as a platform to execute this project we don't need any hardware components other than our system.

V. SYSTEM ARCHITECTURE:



- The user creates an IBM Watson Studio Service on IBM Cloud.
- The user creates an IBM Cloud Object Storage Service and adds that to Watson Studio.
- The user uploads the insurance premium data file into Watson Studio.
- The user creates an AutoAI Experiment to predict insurance premium on Watson Studio.
- AutoAI uses Watson Machine Learning to create several models, and the user deploys the best performing model.
- The user uses the flask application to connect to the deployed model and predict an insurance charge.

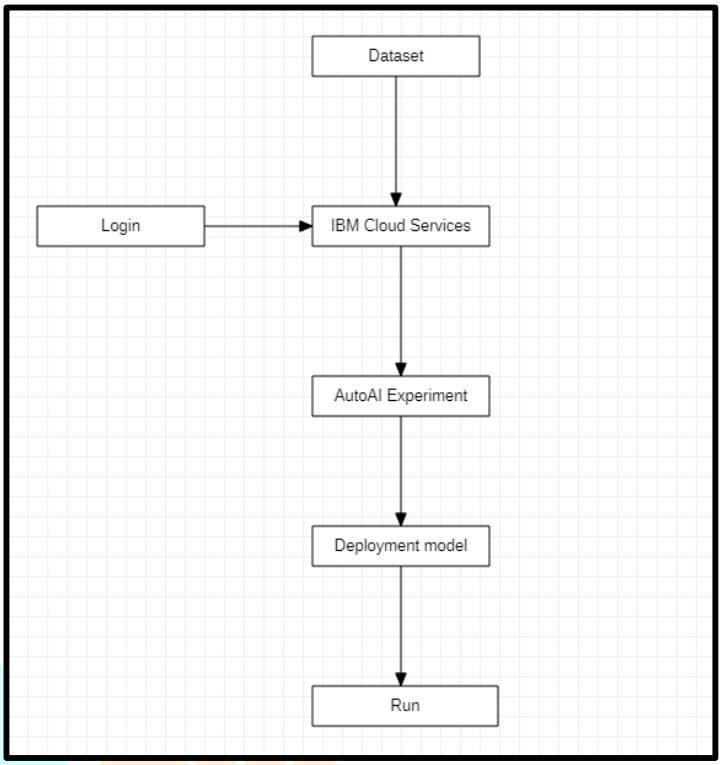
VI. METHODOLGY:

Dataset:

- Dataset is downloaded from Kaggle. Once the dataset is imported we can see the data into a data frame. The dataset consists of 5 rows of features, they are age, sex, bmi, children, smoker and region.

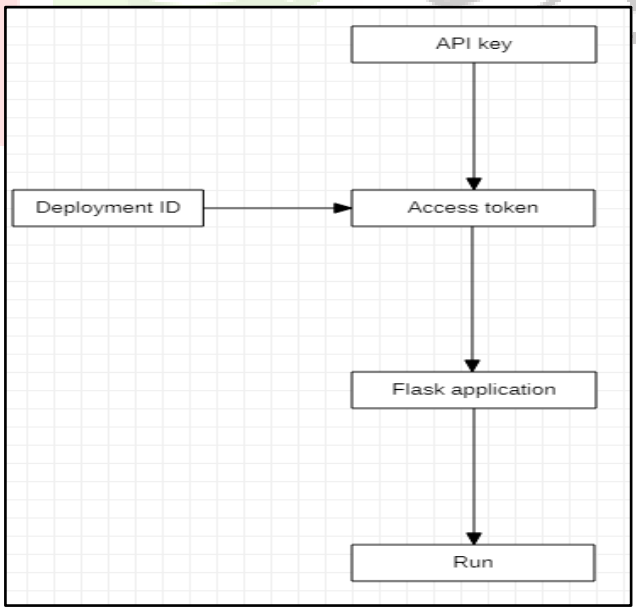
	age	sex	bmi	children	smoker	region	expenses
0	19	female	27.9	0	yes	southwest	16884.92
1	18	male	33.8	1	no	southeast	1725.55
2	28	male	33.0	3	no	southeast	4449.46
3	33	male	22.7	0	no	northwest	21984.47
4	32	male	28.9	0	no	northwest	3866.86

Watson Studio Application:



- Sign up/Login to the IBM cloud account providing your credentials.
- Create a Watson studio services choosing the plan of your choice.
- Now under services in the resource list open the Watson studio service and you will be redirected to this page.
- Now click on get started and click on “create a project” and enter the name of the project.
- Beside you will find the option add the CLOUD OBJECT STORAGE. Click on it and choose your plan and click on create.
- Now select “Auto-Ai PROJECT” in the asset option.
- Now upload your Data file and select the column which you want to predict.
- The Watson Studio service will automatically display the algorithm after providing the above details.
- Next, your AutoAI experiment runs on its own.

Flask Application:



1) Now we are getting our results that are the expenses with the given input.

2) Now we will associate it to a UI using flask application.

- Get a IAM access token in the manage section and create a new API key and make a note of it.

Steps to be followed to create the flow for calculating the premium:

1) Create a UI
2) Grab the values from the UI
3) Set global variables for the UI
4) Get the access token with the help of the http request node.
5) Send the input values to scoring end point in json format along with the access token using the http request node
6) Get the predicted value
7) Parse the OUTPUT.
8) Showcase the output on the UI.

VII. RESULTS:

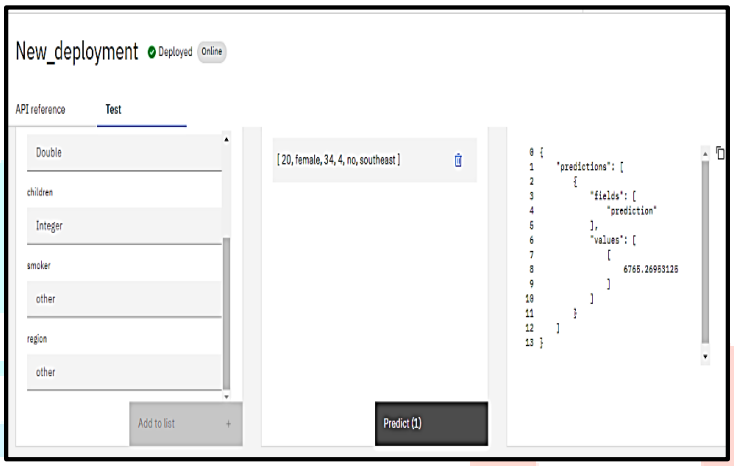


Figure : Watson Studio Prediction

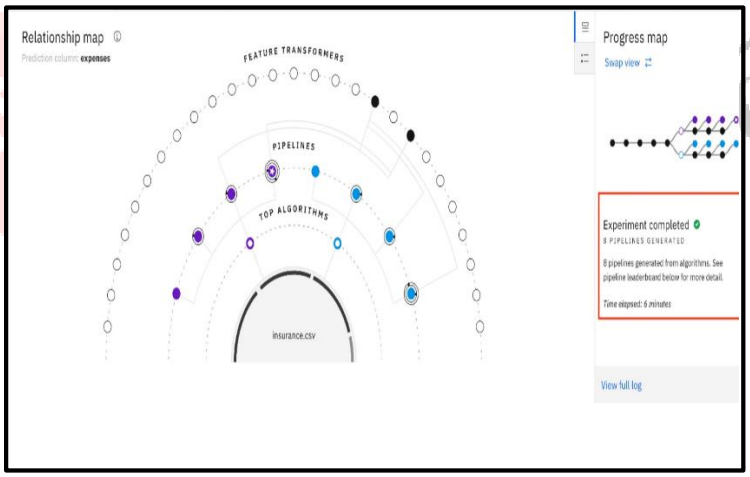


Figure : Relationship Map

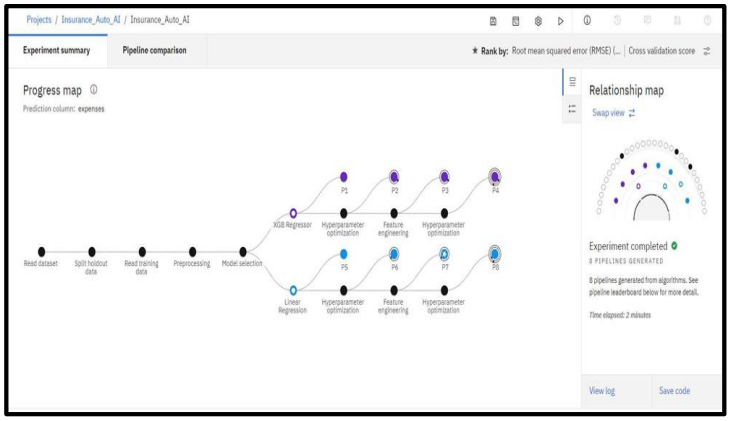


Figure : Process Map

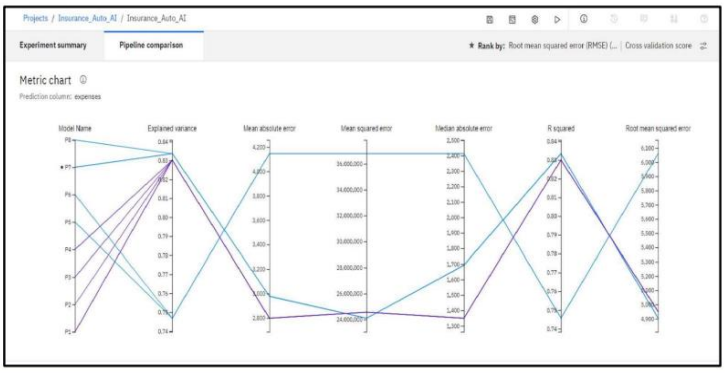


Figure : Metric Chart

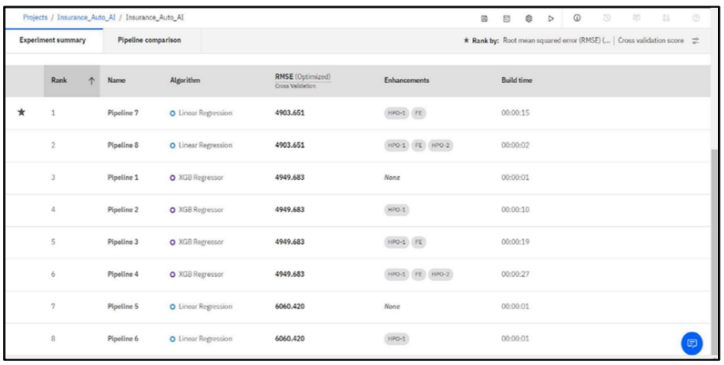


Figure: Experiment Summary

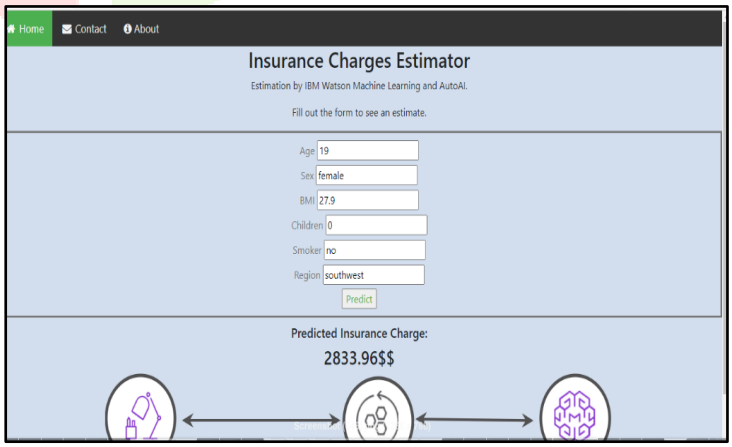


Figure : Flask Application Prediction

- The process map shows which stage of the experiment is running. This may be Hyper Parameter Optimization, feature engineering, or some other stage.
- Each model is ranked based on the metric that you selected. In the specific case that is the RMSE (Root mean squared error). Given that you want that number to be as small as possible, you can see that in the experiment, the model with the smallest RMSE is at the top of the leader-board.
- Now that Auto AI has successfully generated eight different models, you can rank the models by different metrics, by clicking on the drop-down next to "Rank by" on the top corner of the screen, such as explained variance, root mean squared error, R-squared, and mean absolute error. Each time you select a different metric, the models are re-ranked by the metric.
- Smallest RMSE value can be seen that is 4903.651, from Pipeline 7.
- Now, click on "save as" beside pipeline 7 and deploy the model and it is promoted to the deployment space and we are ready to test the model.

VIII. CONCLUSION

Machine learning algorithms can effectively scan all the incoming data, interpret instead of insurance agents, and provide faster settlement to end-users. The workload decreases and the customer satisfaction can be improved. Customers can get to know the factors for the increase in the premium to be paid by them and can control them like smoking. So it is profitable to both company and the customers. Future scope of this project is machine learning algorithms can be used by the customers to select the best insurance policy based on the given data to them and the customers only can chose the best plan.

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