PHASE-2 SUBMISSION

CLOUD APPLICATION DEVELOPMENT-GROUP 3

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PROJECT TITLE: Machine Learning Models with IBM Watson Studio

INTRODUCTON:

The focus of this project is on a comprehensive investigation into the development and deployment of machine learning models in IBM Watson Studio
In order to take our design to innovate for the problem. This involves describing the full process of how you are planning to transform your idea on a design, which was developed during the initial stage.
Hereafter shall be explained furthermore.

1.Data Gathering and Preprocessing:

• Harnessing a wide range of data about customer behaviour and their past and present interactions is a must.
• Missing Data, Handling Outliers, Quality.
• Explore, discover, pattern and relationship through a dataset.

2. Model Selection:

• Select a specific Predictive Use-Case of Machine Learning.
• Try out several different algorithms such as Random Forest, Logistic Regression, and Gradient Boosting to assess which will perform the best with your data model.

3.Model Training:

• Train/validation data set.

• Use the training data to train the chosen machine learning model.

• Use metrics like accuracy, precision, recall, and F1-score to evaluate the model's performance.

C: > Users > Acer > p2.py

```
1
2   from sklearn.model_selection import train_test_split
3   from sklearn.ensemble import RandomForestClassifier
4
5   X_train, X_valid, y_train, y_valid = train_test_split(X, y, test_size=0.2, random_state=42)
6
7   model = RandomForestClassifier(n_estimators=100, random_state=42)
8   model.fit(X_train, y_train)
9
10
11  y_pred = model.predict(X_valid)
12
```

4. Model Validation and Hyperparameter Tuning:

• Optimize the Performance of Your Model; Adjust Hyper parameters.

• Prevent over fitting and encourage generalization with cross validation.

C: > Users > Acer > p2.py > ...

```
1
2   from sklearn.model_selection import GridSearchCV
3
4   param_grid = {
5       'n_estimators': [100, 200, 300],
6       'max_depth': [None, 10, 20],
7   }
8
9   grid_search = GridSearchCV(model, param_grid, cv=5)
10  grid_search.fit(X_train, y_train)
11
12  best_model = grid_search.best_estimator_
13
```

5. Model Deployment:

• As you indicated in your prior response, deploy the trained model as a web service using IBM Watson Studio.

6. Integration with Applications:

• As previously stated, this necessitates the deployment of the chosen model into your applications and systems for making real-time predictions.

7. Monitoring and Maintenance:

• Continually monitor the performance of the deployed model.
• Alert on changes of data pattern and model degradation.
• Keep refreshing your data and retraining the model.

8. Scaling and Feedback Loop:

• In case of success, you may expand the systemic solution in order to work on other predominant use cases involving large number of users.
• Refining the model and functionality of the application depends on continuous gathering of feedback from stakeholders and end-users.