Assignment - Machine Learning [Major]

Grading Parameters	Marks
Data Cleaning and Pre-processing	10
Insightful Data Analysis	10
Machine Learning Techniques	10
Model Saving and Loading	10
Model Validation on New Data	10
Total Marks	50

Use the **Oil Spill Dataset** and solve the following question by using the dataset, to download the dataset click on the dataset name.

About Dataset

The dataset was developed by starting with satellite images of the ocean, some of which contain an oil spill and some that do not.
Images were split into sections and processed using computer vision algorithms to provide a vector of features to describe the contents of the image section or patch.
The task is, given a vector that describes the contents of a patch of a satellite image, then predicts whether the patch contains an oil spill or not, e.g. from the illegal or accidental dumping of oil in the ocean.

There are two classes and the goal is to distinguish between spill and non-spill using the features of a given ocean patch.

- **Non-Spill:** negative case, or majority class.
- **Oil Spill:** positive case, or minority class.

There are a total of **50 Columns** in the Dataset, the output column is named as a **target.**

Q1) Download the Oil Spill Dataset and perform Data cleaning and **Data Pre-Processing** if Necessary.

Q2) Use various methods such as **Handling null values, One-Hot Encoding, Imputation, and Scaling of Data Pre-Processing** where necessary.
Q3) Derive some **insights** from the dataset.

Q4) Apply various Machine Learning techniques to predict the output in the **target** column, make use of Bagging and Ensemble as required, and find the best model by evaluating the model using Model evaluation techniques.

Q5) Save the **best model** and Load the model

Q6) Take the original data set and make another dataset by randomly picking **20 data points** from the oil spill dataset and applying the saved model to the same.

Steps To Submit A Machine Learning Assignment.

Step 1: Save Your Work:

➔ In Jupyter Notebook, click "File" > "Save and Checkpoint" to save. Optionally, use "Save As" to rename the file.

Step 2: Organize Files (Optional):

➔ Create a new folder for better organization.

Step 3: Move Notebook:

➔ Drag your saved notebook into the new folder (if created).

Step 4: Zip the Folder:

➔ Right-click the folder, select "Compress" (macOS) or "Send to" > "Compressed (zipped) folder" (Windows).

Step 5: Create a New Word Document

1) Open Microsoft Word or any word processing software.

2) Create a new document and give it a suitable title, such as "**Machine Learning Assignment Submission - (Your Name)**"

Step 6: Add Screenshots of Inputs and Outputs for each question in the assignment:

1) Type the question number and description.

2) Take a screenshot of your Python code Input.

3) Paste the screenshot into the Word document.

4)Take a screenshot of the output code (result set).

5)Paste the screenshot of the output below the Input screenshot.

Step 7: Review Your Document

1) Review the document to ensure all questions, queries, and output screenshots are correctly arranged.

2) Double-check for any typos or formatting issues.

Step 8: Save Your Document

1) Click on the "**File**" menu in Word.

2) Select "**Save As**."

3) Choose a location on your computer where you want to save the document.

4) Enter a file name for the document and select "**Save**."

Step 9: Convert to PDF

Now, let's convert your Word document into a PDF file.

1) If you have Microsoft Word with a "Save As PDF" option:

- In the "**File**" menu, select "**Save As**."
- Choose a location to save the PDF file.
- In the "**Save as type**" dropdown, select "**PDF**."
- Click "**Save**."

2) If you don't have the "**Save As PDF**" option:

- Open your Word document.
- Click "**File**" > "**Print**."
- Choose a PDF printer or select "**Microsoft Print to PDF**."
- Click "**Print**" and choose a location to save the PDF.

Step 10: Upload and Submit

1) Visit your assignment submission platform depending on the submission method.

2) Locate the option to upload your assignment.

3) Upload the PDF file of your assignment and the jupyter file

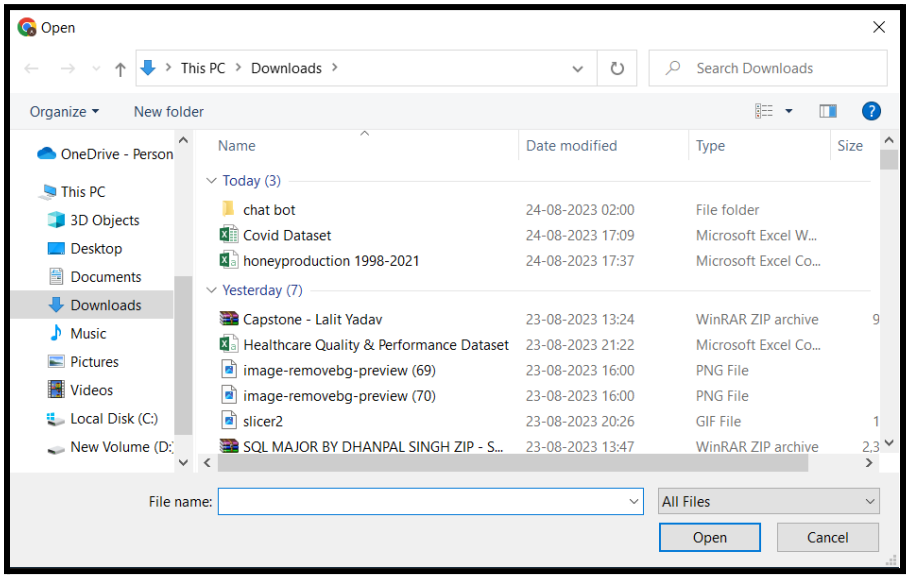
Following these steps will ensure you create a well-organized submission of your Machine Learning Assignment.

How To Zip Your File & Submit Assignments

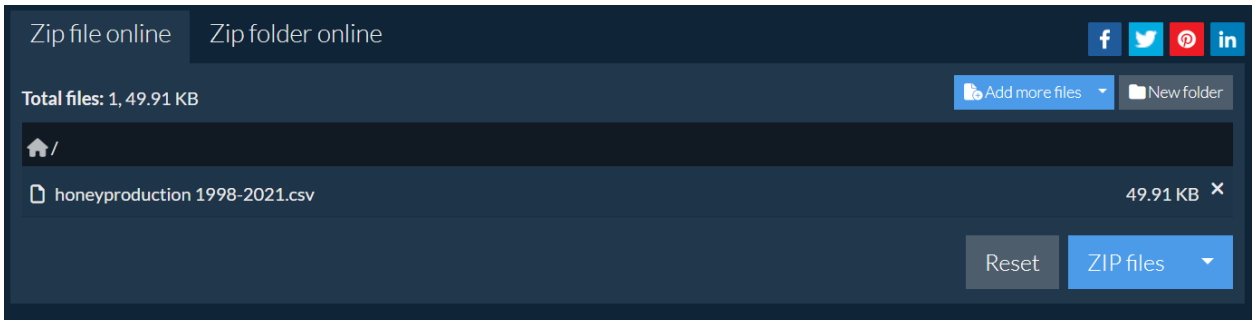
Step 1: Open the [Ezyzip Website] on your Web Browser

Step 2: Click on “Select files to archive”

Step 3: Select Your Assignment File From Its Location To Upload



Step 4: Once The Upload Is Done, Zip The file by clicking on “ZIP files”

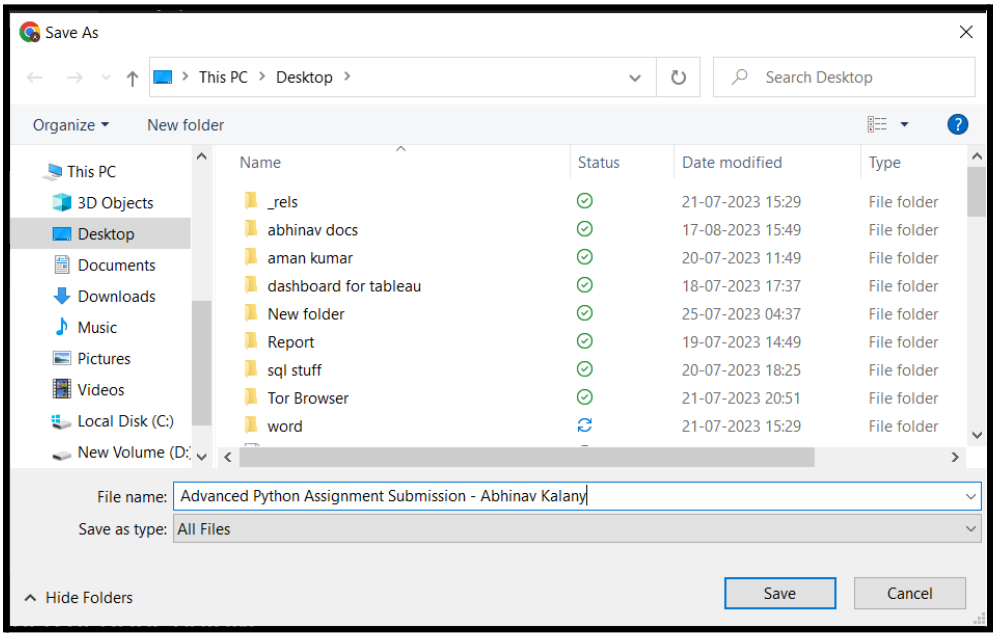


Step 5: Once The ZIP File Is Compressed Click on Save ZIP File

Step 6: Name This Zip File While Saving Into Your Local folder

➔ **Name Format:**

"**(Assignment name)Assignment Submission - (Your Name)**"



Step 7: Once Saved, Submit This ZIP FIle On Your Skillacademy Assignment Submission Portal