

## Introduction

The objective of this workshop was to take the dataset provided in the GitHub repository and train it using the code provided that required corrections at some points. The project introduced me to the machine learning practice of Image Classification that identifies and classifies images based on learned models. To address some of the issues at the beginning, I continued to use Gemini for the most part but realized that the reason behind some of the errors were the initial setting parameters of width and height that were interfering with the training process and causing the output to be erroneous (workshop\_1.ipynb).

Prior to this workshop, I did not fully appreciate the capability of Google Colab. I thought that it mainly executed plain Python code but did not perform big dataset processing and machine learning model training. But with this experience, it showed that Google Colab is not just for processing big datasets but for enabling the user to train models, examine the data, and derive meaningful conclusions (workshop\_1.ipynb). What amazed me most was that the model could classify the content of the image and give the likelihood of it representing something (workshop\_1.ipynb). The real-time classification feature was something new that I came across for the first time, and it expanded the horizon of possibilities of machine learning for me.

## Problems Experienced

One of the most important obstacles that I overcame was generating the model output images of the dog with the respective classification percentages (workshop\_1.ipynb). The obstacle came about due to the incorrect width and height sizes, something that matters for the processing of the pictures to be consistent. To be frank with me, at the beginning, I assumed that the sizes were correctly configured at  $224 \times 224$  but most likely typed it wrongly by mistake. Therefore, I assumed the number was incorrect and spent most of my time testing different sizes such as 32, 64, 128, etc. (workshop\_1.ipynb).

In retrospect, it would have saved me at least half an hour of unnecessary debugging if I had taken the time for a quick inspection of the code (workshop\_1.ipynb). The lesson here learned is the importance of careful examination of minute details while employing machine learning models. Hereafter, I shall practice more formal debugging by input verification before making global changes and employing the use of print statements for verification of critical variable values.

One of the challenges that I faced was trying to understand the structure of the provided code (workshop\_1.ipynb). Even though it did not require me to type it from the start since it was pre-existing code, it did require me to learn the logic of the various functions. This required me to search for terms and principles for me to fully understand the mechanism by which the model processed and categorized the images (workshop\_1.ipynb). What benefited me the most was breaking the code into pieces

and noting the contribution of each section of the code toward the overall training process.

## Main Points

This workshop enhanced the machine learning and image classification knowledge that I already had. I knew of machine learning but hadn't actively utilized it. Although I did not complete the model independently, the discovery of the errors and the edits that were needed educated me about the fundamental processes of model training (workshop\_1.ipynb). Watching the progress bar while the model trained and the improvement it showed over the duration of the training was such a good feeling (workshop\_1.ipynb).

One of the most valuable lessons that I learned was the ability of data-driven learning. The model could input raw image data, process it, and predict with excellent accuracy (workshop\_1.ipynb). The process proved that machine learning can be implemented for nearly anything that happens within the world.

## Real-World Applications

Machine learning and image classification are of great interest due to the wide number of practical applications they find within different industries. Medical images are analyzed by the same models for the detection of conditions such as cancer or pneumonia (workshop\_1.ipynb). Facial recognition systems are built upon the classification of images for identifying people and increasing the security levels (workshop\_1.ipynb). Companies utilize machine learning for classifying products and making suggestions for customers within the e-commerce and retail industry based upon the history of the customers' browsed items (workshop\_1.ipynb).

In addition, the models are able to predict trends for the future using past data (workshop\_1.ipynb). Financial analysts use machine learning to predict trends within the stock market while meteorologists use it to predict weather trends. The ability to train the models using past data and deploy the models for new situations is the empowering ability that keeps shaping industries worldwide (workshop\_1.ipynb).

## Conclusion

In short, the workshop was informative and familiarized me with the practical application of machine learning. Despite the difficulty at times and the need at times to troubleshoot the incorrect sizes of the images, it taught me valuable lessons about overcoming challenges, debugging codes, and the importance of precision with data science (workshop\_1.ipynb). The experience inspired me to learn more about AI, machine learning, and decision-making with the use of data (workshop\_1.ipynb).

In the coming times, I want to learn more by experimenting with different machine learning models and learn model building from the basics (workshop\_1.ipynb). I want to learn more about the various applications of machine learning such as natural language

processing and predictive analysis. The workshop prepared the groundwork well, and I hope that these skills are implemented for future projects (workshop\_1.ipynb)

## References

workshop\_1.ipynb. (Year). Internal Notebook Documentation.