

## A collage of 20 photographs showing various types of mushrooms, including Amanita muscaria, Boletus, and others, growing in a forest setting. The images are arranged in a grid-like fashion, with some showing close-ups of individual mushrooms and others showing clusters or groups of mushrooms in their natural habitat. The mushrooms exhibit a wide variety of colors, shapes, and sizes, from small, delicate specimens to large, robust ones. The background of the images is a lush, green forest floor with moss, fallen leaves, and tree trunks.

A collage of 20 photographs showing various types of mushrooms in different forest environments. The images include: a cluster of small, light-colored mushrooms on a forest floor; three large, dark-capped mushrooms with thick stems; a cluster of light-colored, fan-shaped mushrooms on a log; a cluster of red-capped mushrooms with white spots on a log; a cluster of large, brown-capped mushrooms on a mossy log; a large, dense cluster of small, light-colored mushrooms on a log; a cluster of small, light-colored mushrooms on a mossy log; a cluster of red-capped mushrooms with white spots on a forest floor; a large, dense cluster of small, light-colored mushrooms on a forest floor; a cluster of red-capped mushrooms with white spots on a forest floor; a cluster of large, brown-capped mushrooms on a mossy log; a cluster of small, light-colored mushrooms on a forest floor; a cluster of red-capped mushrooms with white spots on a forest floor; a cluster of large, brown-capped mushrooms on a mossy log; a cluster of small, light-colored mushrooms on a forest floor; a cluster of red-capped mushrooms with white spots on a forest floor; a cluster of large, brown-capped mushrooms on a mossy log; a cluster of small, light-colored mushrooms on a forest floor; and a cluster of red-capped mushrooms with white spots on a forest floor.

# Mushrooms

According to Wikipedia



A **mushroom** or **toadstool** is the fleshy, **spore**-bearing **fruiting body** of a **fungus**, typically produced above ground, on soil, or on its **food** source.

There are many mushrooms that are edible but there are also many that are poisonous.

# Edible or Poisonous?

We explored this question by utilizing 2 different datasets

- Data gathered from the article **Reviewing the world's edible mushroom species: A new evidence-based classification system** at <https://onlinelibrary.wiley.com/doi/full/10.1111/1541-4337.12708>

Used to generate charts showing toxicity utilizing the scientific name

- Kaggle's **Mushroom Classification** Dataset <https://www.kaggle.com/uciml/mushroom-classification>

Used to generate 3 machine learning models to predict mushroom toxicity

# Tools Utilized

- Jupyter Notebook
- Python Pandas
- Python Matplotlib
- Python Seaborn
- Python Scikit-Learn
- HTML/CSS/Bootstrap
- Javascript D3.js
- Github Pages



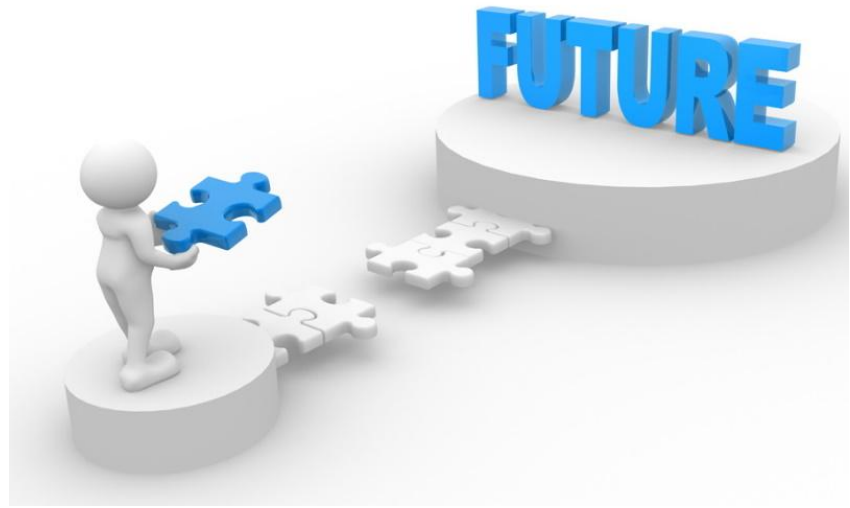
# Difficulties Encountered



- Large Number of mushrooms that exist
- Common Name vs Scientific Name
- No scientific names or images included with the Kaggle data
- Complexity of finding pictures and matching to scientific name
- Varies websites with conflicting scientific names and information for what appears to be the same mushroom
- Random Forest and K-Nearest Neighbor Machine Learning Models got identical scores which could possibly indicate a problem.



# Future Enhancements



- We would like to add a feature that collects images of mushrooms utilizing the scientific name. We would also collect data that compares the scientific name as well as the common name and statistics about each mushroom. The images would then be utilized to train machine learning models to identify the scientific name of a mushroom image presented before displaying information about that mushroom including the common name and identifying whether to image of the mushroom was of one that is edible or not.
- We would like to future investigate the Random Forest and K-Nearest Neighbor Models to try to determine the cause of identical scores.
- We would like to enhance the sunburst chart by adding a feature where if you click on a genera or species, a popover would come on screen providing a link to MycoBank or any other hub providing more information on the mushroom.