

# The Prediction of Mushroom Edibility Using Machine Learning

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# Hunting edible mushrooms in the wild can be an exciting and rewarding process

**Hunter-Gatherers**



**The Trophy**



**Wouldn't it be great if you could determine whether a mushroom you encounter in nature is poisonous or not with machine learning?**

**Agaricus Campestris (Non-poisonous)**

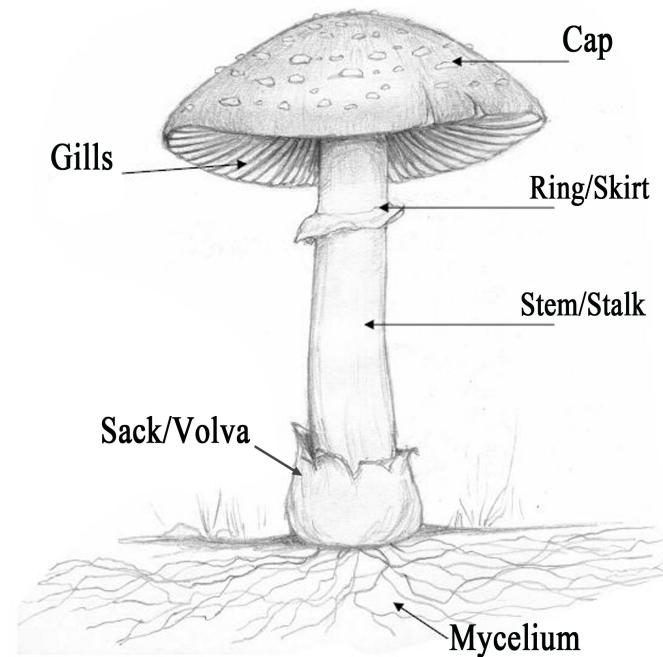


**Agaricus Californicus (Poisonous)**



# Wouldn't it be great if you could determine whether a mushroom you encounter in nature is poisonous or not with machine learning?

	Agaricus campestris (non-poisonous)	Agaricus californicus (poisonous)
cap color	white	whitish to brown
gill color	pink (young), chocolate brown (mature)	pink (young), chocolate brown (mature)
ring	no	yes
bruises?	no	yes
habitat	grass	forest and grass
odor	mild, mushroomy	antiseptic



# For this project, I used the UCI Mushroom Data Set to determine if machine learning could be used to classify the edibility of mushrooms

The data set consists of mushrooms from 2 different families only (Agaricus, Lepiota)

Number of instances = 8124

Number of features = 22

All features are categorical

Target variable is edibility

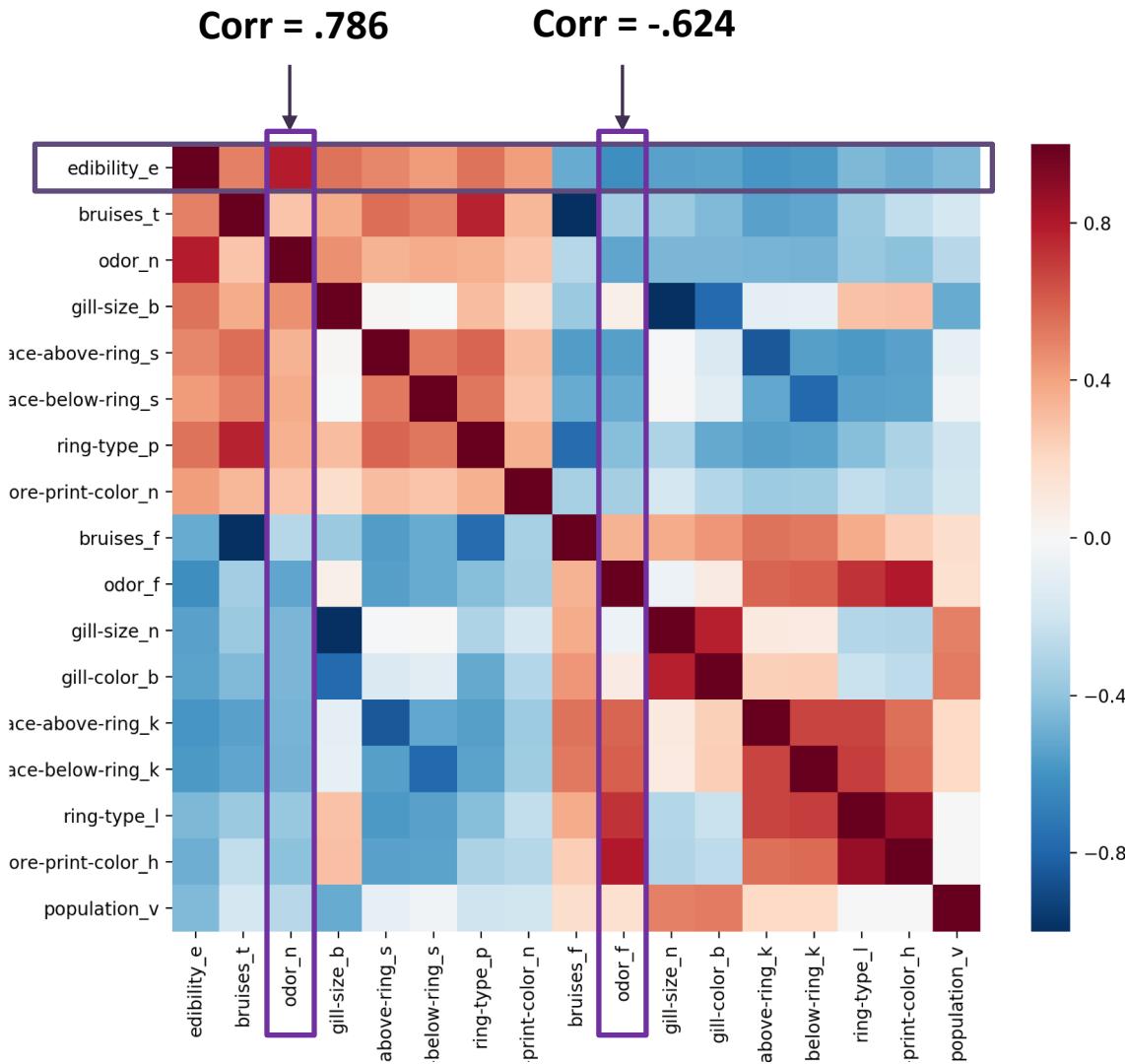
52% edible

48% non-edible

## Features:

- Cap-shape, Cap-surface, Cap-color
- Bruises?
- Odor
- Gill-attachment, Gill-spacing, Gill-size, Gill-color
- Stalk-shape, Stalk-root, Stalk-surface-above-ring, Stalk-surface-below-ring
- Stalk-color-above-ring, Stalk-color-below-ring
- Veil-type, Veil-color
- Ring-number, Ring-type
- Spore-print-color
- Population
- Habitat

# Certain features are strongly correlated with edibility





# Appendix: Mushroom Attribute Information

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7. Attribute Information: (classes: edible=e, poisonous=p)
  1. cap-shape: bell=b,conical=c,convex=x,flat=f,
                 knobbed=k,sunken=s
  2. cap-surface: fibrous=f,grooves=g,scaly=y,smooth=s
  3. cap-color: brown=n,buff=b,cinnamon=c,gray=g,green=r,
                 pink=p,purple=u,red=e,white=w,yellow=y
  4. bruises?: bruises=t,no=f
  5. odor: almond=a,anise=l,creosote=c,fishy=y,foul=f,
            musty=m,none=n,pungent=p,spicy=s
  6. gill-attachment: attached=a,descending=d,free=f,notched=n
  7. gill-spacing: close=c,crowded=w,distant=d
  8. gill-size: broad=b,narrow=n
  9. gill-color: black=k,brown=n,buff=b,chocolate=h,gray=g,
                 green=r,orange=o,pink=p,purple=u,red=e,
                 white=w,yellow=y
 10. stalk-shape: enlarging=e,tapering=t
 11. stalk-root: bulbous=b,club=c,cup=u,equal=e,
                 rhizomorphs=z,rooted=r,missing=?
 12. stalk-surface-above-ring: fibrous=f,scaly=y,silky=k,smooth=s
 13. stalk-surface-below-ring: fibrous=f,scaly=y,silky=k,smooth=s
 14. stalk-color-above-ring: brown=n,buff=b,cinnamon=c,gray=g,orange=o,
                             pink=p,red=e,white=w,yellow=y
 15. stalk-color-below-ring: brown=n,buff=b,cinnamon=c,gray=g,orange=o,
                             pink=p,red=e,white=w,yellow=y
 16. veil-type: partial=p,universal=u
 17. veil-color: brown=n,orange=o,white=w,yellow=y
 18. ring-number: none=n,one=o,two=t
 19. ring-type: cobwebby=c,evanescent=e,flaring=f,large=l,
                 none=n,pendant=p,sheathing=s,zone=z
 20. spore-print-color: black=k,brown=n,buff=b,chocolate=h,green=r,
                        orange=o,purple=u,white=w,yellow=y
 21. population: abundant=a,clustered=c,numerous=n,
                  scattered=s,several=v,solitary=y
 22. habitat: grasses=g,leaves=l,meadows=m,paths=p,
                urban=u,waste=w,woods=d
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