Garrett Bogart
Daniel Oliveros

For the first query we kept only the categories that involved color: cap-color, gill-color, stalk-color-above-ring ,stalk-color-below-ring, veil-color, spore-print-color, class. We then looked for associations using the Apriori method. We determined various associations regarding what conditions correlate with a mushroom being poisonous. If a mushroom has buff colored gills then the mushroom will be poisonous.

```
 1. gill-color=b 1728 ==> class=p 1728    conf:(1)
 2. gill-color=b veil-color=w 1728 ==> class=p 1728    conf:(1)
 3. gill-color=b spore-print-color=w 1728 ==> class=p 1728    conf:(1)
 4. gill-color=b veil-color=w spore-print-color=w 1728 ==> class=p 1728    conf:(1)
 5. cap-color=e gill-color=b 864 ==> class=p 864    conf:(1)
 6. cap-color=n gill-color=b 864 ==> class=p 864    conf:(1)
 7. gill-color=b stalk-color-above-ring=p 864 ==> class=p 864    conf:(1)
 8. gill-color=b stalk-color-above-ring=w 864 ==> class=p 864    conf:(1)
 9. gill-color=b stalk-color-below-ring=p 864 ==> class=p 864    conf:(1)
10. gill-color=b stalk-color-below-ring=w 864 ==> class=p 864    conf:(1)
```

We then removed gill-color from our categories and ran our method again. A stalk color of pink and a white spore print were also associated with poisonous. A spore print color of chocolate is poisonous. We also determined cap and veil color to not be indicative enough on their own to determine if a mushroom is poisonous.

```
 1. stalk-color-above-ring=p spore-print-color=w 864 ==> class=p 864    conf:(1)
 2. stalk-color-below-ring=p spore-print-color=w 864 ==> class=p 864    conf:(1)
 3. stalk-color-above-ring=p veil-color=w spore-print-color=w 864 ==> class=p 864    conf:(1)
 4. stalk-color-below-ring=p veil-color=w spore-print-color=w 864 ==> class=p 864    conf:(1)
 5. spore-print-color=h 1632 ==> class=p 1584    conf:(0.97)
 6. veil-color=w spore-print-color=h 1632 ==> class=p 1584    conf:(0.97)
 7. cap-color=e spore-print-color=w 924 ==> class=p 876    conf:(0.95)
 8. cap-color=e veil-color=w spore-print-color=w 924 ==> class=p 876    conf:(0.95)
 9. cap-color=n spore-print-color=w 988 ==> class=p 892    conf:(0.9)
10. cap-color=n veil-color=w spore-print-color=w 988 ==> class=p 892    conf:(0.9)
```

For the second query we didn't reduce our categories. We found that no odor and a ring number of one was a good indicator of edibleness.

```
 1. odor=n ring-number=o 2928 ==> class=e 2880    conf:(0.98)
 2. odor=n veil-type=p ring-number=o 2928 ==> class=e 2880    conf:(0.98)
 3. odor=n gill-size=b 3288 ==> class=e 3216    conf:(0.98)
 4. odor=n gill-size=b veil-type=p 3288 ==> class=e 3216    conf:(0.98)
 5. odor=n gill-attachment=f gill-size=b 3096 ==> class=e 3024    conf:(0.98)
 6. odor=n gill-size=b veil-color=w 3096 ==> class=e 3024    conf:(0.98)
 7. odor=n gill-attachment=f gill-size=b veil-type=p 3096 ==> class=e 3024    conf:(0.98)
 8. odor=n gill-attachment=f gill-size=b veil-color=w 3096 ==> class=e 3024    conf:(0.98)
 9. odor=n gill-size=b veil-type=p veil-color=w 3096 ==> class=e 3024    conf:(0.98)
10. odor=n gill-attachment=f gill-size=b veil-type=p veil-color=w 3096 ==> class=e 3024    conf:(0.98)
```

We then removed odor from our categories and reran the test. We then determined a smooth stalk surface above and below to be a good indicator of edibleness.

```
 7. gill-size=b stalk-surface-above-ring=s ring-number=o 3152 ==> class=e 3008    conf:(0.95)
 8. gill-size=b stalk-surface-above-ring=s veil-type=p ring-number=o 3152 ==> class=e 3008    conf:(0.95)
 9. gill-size=b stalk-surface-above-ring=s stalk-surface-below-ring=s 3064 ==> class=e 2920    conf:(0.95)
10. gill-size=b stalk-surface-above-ring=s stalk-surface-below-ring=s veil-type=p 3064 ==> class=e 2920    conf:(0.95)
```

A woods habitat is associated with a white veil color. A foul odor to a white veil color. A black spore print, wooded habitat was associated with no odor. A white veil, a chocolate spore print is associated with foul odor,

```
 1. stalk-color-above-ring=w 4464 ==> veil-color=w 4464    <conf:(1)> lift:(1.03) lev:(0.01) [109] conv:(109.9)
 2. stalk-color-below-ring=w 4384 ==> veil-color=w 4384    <conf:(1)> lift:(1.03) lev:(0.01) [107] conv:(107.93)
 3. stalk-color-above-ring=w stalk-color-below-ring=w 3520 ==> veil-color=w 3520    <conf:(1)> lift:(1.03) lev:(0.01) [86] conv:(86.66)
 4. habitat=d 3148 ==> veil-color=w 3148    <conf:(1)> lift:(1.03) lev:(0.01) [77] conv:(77.5)
 5. odor=f 2160 ==> veil-color=w 2160    <conf:(1)> lift:(1.03) lev:(0.01) [53] conv:(53.18)
 6. habitat=g 2148 ==> veil-color=w 2148    <conf:(1)> lift:(1.03) lev:(0.01) [52] conv:(52.88)
 7. odor=n stalk-color-above-ring=w 2064 ==> veil-color=w 2064    <conf:(1)> lift:(1.03) lev:(0.01) [50] conv:(50.81)
 8. spore-print-color=w 2388 ==> veil-color=w 2380    <conf:(1)> lift:(1.02) lev:(0.01) [50] conv:(6.53)
 9. odor=n 3528 ==> veil-color=w 3328    <conf:(0.94)> lift:(0.97) lev:(-0.01) [-113] conv:(0.43)
10. cap-color=n 2284 ==> veil-color=w 2092    <conf:(0.92)> lift:(0.94) lev:(-0.02) [-135] conv:(0.29)
```

```
1. spore-print-color=h 1632 ==> odor=f 1584    conf:(0.97)
2. veil-color=w spore-print-color=h 1632 ==> odor=f 1584    conf:(0.97)
3. spore-print-color=k habitat=d 960 ==> odor=n 864    conf:(0.9)
4. veil-color=w spore-print-color=k habitat=d 960 ==> odor=n 864    conf:(0.9)
```