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CS365 – AI & Machine Learning

Lab C – Decision Trees

vdkhuat16_mbvo14_labC_report.pdf

Trees generated:

1) pets.txt:

```
size = tiny:
     color = white:
          earshape = pointed:
               tail = yes:
                    no
               tail = no:
                    yes
          earshape = folded:
               yes
     color = brown:
          no
     color = gray:
          no
     color = orange:
          no
     color = yellow:
          no
 size = small:
     color = white:
          yes
     color = brown:
          no
     color = gray:
          earshape = pointed:
               tail = yes:
                    yes
               tail = no:
                    yes
          earshape = folded:
               yes
     color = orange:
          yes
     color = yellow:
          yes
 size = medium:
     color = white:
          no
     color = brown:
          yes
```

```
        color = gray:
              no
        color = orange:
              no
        color = yellow:
              no
    size = large:
        no
    size = enormous:
        no
```

2) tennis.txt:

```
    outlook = sunny:
        humidity = high:
              no
        humidity = normal:
              yes
    outlook = overcast:
        yes
    outlook = rain:
        wind = weak:
              yes
        wind = strong:
              no
```

3) titanic2.txt:

```
   sex = male:
        pclass = 1st:
              age = adult:
                    no
              age = child:
                    yes
        pclass = 2nd:
              age = adult:
                    no
              age = child:
                    yes
        pclass = 3rd:
              age = adult:
                    no
              age = child:
                    no
        pclass = crew:
              age = adult:
                    no
              age = child:
                    no
    sex = female:
        pclass = 1st:
```

```
            age = adult:
                  yes
            age = child:
                  yes
      pclass = 2nd:
            age = adult:
                  yes
            age = child:
                  yes
      pclass = 3rd:
            age = adult:
                  no
            age = child:
                  no
      pclass = crew:
            age = adult:
                  yes
            age = child:
                  yes
```

Training set accuracy:

1) pets.txt: 85.71%
2) tennis.txt: 100%
3) titanic2.txt: 79.09%

Number of nodes in the tree:

1) pets.txt: 29
2) tennis.txt: 8
3) titanic2.txt: 27

Leave-one-out cross-validation accuracy:

1) pets.txt: 40%
2) tennis.txt: 78.57%
3) titanic2.txt: 79.05%