**species**

**trees**

| code | species |
| --- | --- |
| m | maple |
| p | pine |

| tree | x | y | species | diameter | priority |
| --- | --- | --- | --- | --- | --- |
| A | 10 | 4 | m | 8 | 71 |
| B | 20 | 4 | m | 10 | 100 |
| C | 30 | 4 | p | 6 | 30 |
| D | 40 | 4 | p | 8 | 40 |
| E | 50 | 4 | m | 12 | 99 |

import sqlite3

c = sqlite3.connect("worksheet.db")

def **qry**(sql):

 return pd.read\_sql(sql, c)

species = qry("SELECT \* FROM species")

trees = qry("SELECT \* FROM trees")

|  |  |
| --- | --- |
| **1** | trees[trees["priority"] > 90][["x", "y"]] # convert to SQL |
| **2** | qry("**SELECT** x+y **FROM** trees **WHERE** species = 'm'") # convert to Pandas |
| **3** | cd = species["code"][species["species"]=="maple"].iloc[0]trees[trees["species"] == cd]["tree"] # convert to 2 SQL queries |
| **4** | qry("**SELECT** species **FROM** trees **ORDER BY** priority DESC") |
| **5** |

| tree | x | y | species | diameter | priority |
| --- | --- | --- | --- | --- | --- |
| A | 10 | 4 | m | 8 | 71 |
| B | 20 | 4 | m | 10 | 100 |
| C | 30 | 4 | p | 6 | 30 |
| D | 40 | 4 | p | 8 | 40 |
| E | 50 | 4 | m | 12 | 99 |

| code | species |
| --- | --- |
| m | maple |
| p | pine |

list(qry("**SELECT** tree, priority **FROM** trees " + "**ORDER BY** priority DESC **LIMIT** 1”).iloc[0]) |
| **6** | qry("""**SELECT** COUNT(SPECIES) AS c1, COUNT(DISTINCT SPECIES) as c2 **FROM** trees""") |
| **7** | qry("""**SELECT** species, COUNT(SPECIES) AS count, AVG(diameter) AS size **FROM** trees **GROUP BY** species **ORDER BY** count DESC""") |
|  |  |

**trees**

**species**

| year | color | style | owner | alt | active |
| --- | --- | --- | --- | --- | --- |
| 1999 | red | K-81 | private | 1179 | 0 |
| 2000 | red | M-3 | public | 1065 | 0 |
| 2001 | green | Pacer | private | 1058 | 1 |
| 2010 | blue | Pacer | public | 1081 | 1 |
| 2014 | blue | Pacer | public | 1052 | 1 |
| 2018 | blue | Pacer | public | 1109 | 1 |

|  |  |
| --- | --- |
| **8** | qry("**SELECT** color, year **FROM** hydrants **WHERE** color = 'blue' ") |
| **9** | df = qry("**SELECT** color, year **FROM** hydrants")df[df.color == "blue"] |
| **10** | qry("**SELECT** year **FROM** hydrants **WHERE** owner='private' AND active") |
| **11** | df = qry("**SELECT** year, style, active **FROM** hydrants")df[df.active == 1][“style"] |

**hydrants**

hydrants = qry("""

 SELECT \* FROM hydrants

""")

|  |  |
| --- | --- |
|  |  |
| **12** | hydrants["color"].value\_counts() # convert to SQL |
| **13** | qry("""**SELECT** color, COUNT(\*) **FROM** hydrants **WHERE** active **GROUP BY** color""") |
| **14** | qry("""**SELECT** color, COUNT(\*) AS count **FROM** hydrants **GROUP BY** color **HAVING** count > 1""") |
| **15** | qry("""**SELECT** color, COUNT(\*) AS count **FROM** hydrants **WHERE** year >= 2000 **GROUP BY** color **HAVING** count < 2""") |

| year | color | style | owner | alt | active |
| --- | --- | --- | --- | --- | --- |
| 1999 | red | K-81 | private | 1179 | 0 |
| 2000 | red | M-3 | public | 1065 | 0 |
| 2001 | green | Pacer | private | 1058 | 1 |
| 2010 | blue | Pacer | public | 1081 | 1 |
| 2014 | blue | Pacer | public | 1052 | 1 |
| 2018 | blue | Pacer | public | 1109 | 1 |

**hydrants**

hydrants = qry("""

 SELECT \* FROM hydrants

""")