`

EX. NO. :1
DATE :

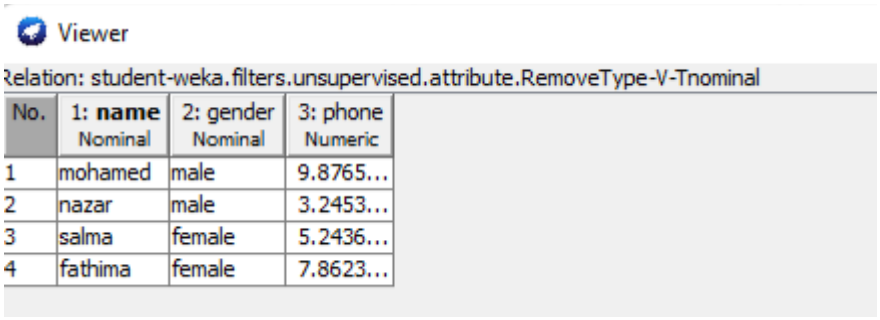
List all the categorical or nominal attributes and real-valued attributes separately

---

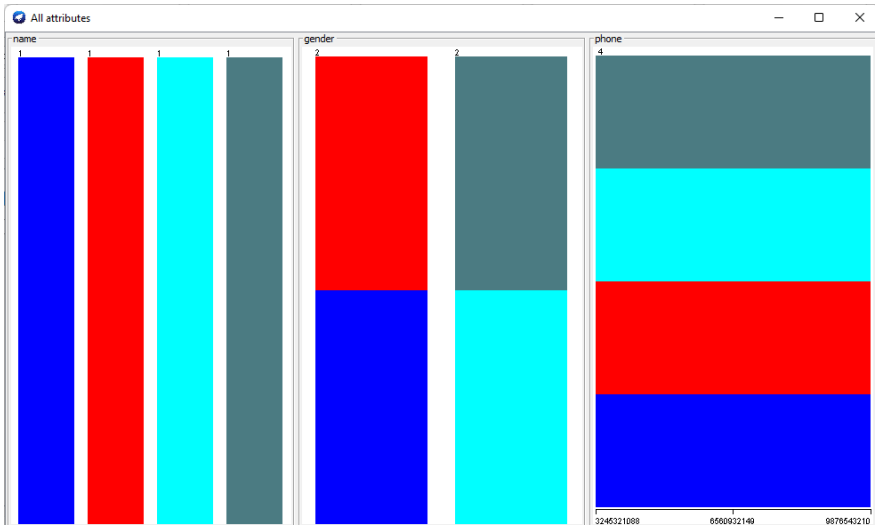
@relation student

@attribute name{mohamed,nazar,salma,fathima}
@attribute rollno numeric
@attribute gender{male,female}
@attribute phone numeric

@data
mohamed,101,male,9876543210
nazar,102,male,3245321088
salma,103,female,5243677858
fathima,104,female,7862385555



No.	1: name Nominal	2: gender Nominal	3: phone Numeric
1	mohamed	male	9.8765...
2	nazar	male	3.2453...
3	salma	female	5.2436...
4	fathima	female	7.8623...



`

EX. NO. :2
DATE :

Create an Employee Table

@relation emp

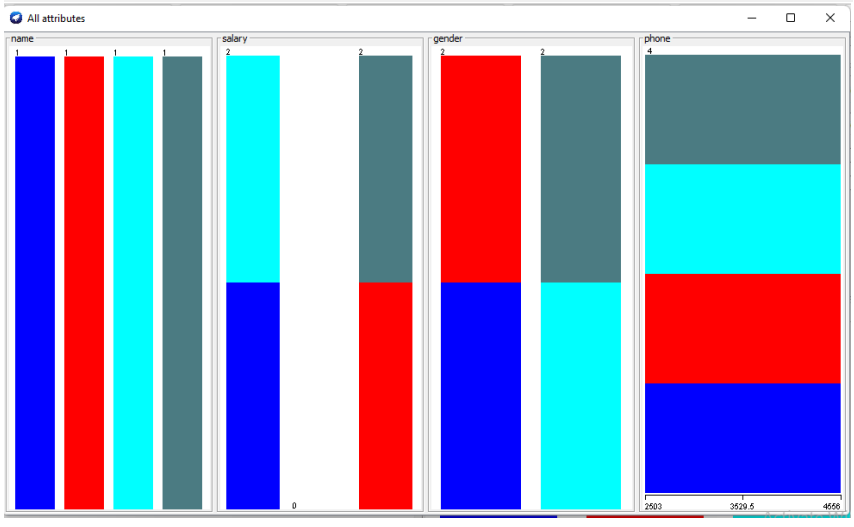
@attribute name{a,b,c,d}
@attribute id numeric
@attribute salary{low,medium,high}
@attribute exp numeric
@attribute gender{male,female}
@attribute phone numeric

@data
a,101,low,2,male,2503
b,102,high,3,male,3435
c,103,low,4,female,3435
d,104,high,5,female,4556

Viewer

Relation: emp-weka.filters.unsupervised.attribute.RemoveType-V-Tnominal

No.	1: name Nominal	2: salary Nominal	3: gender Nominal	4: **phone** Numeric
1	a	low	male	2503.0
2	b	high	male	3435.0
3	c	low	female	3435.0
4	d	high	female	4556.0



`

EX. NO. :3
DATE :

Create a Weather Table

@relation weather

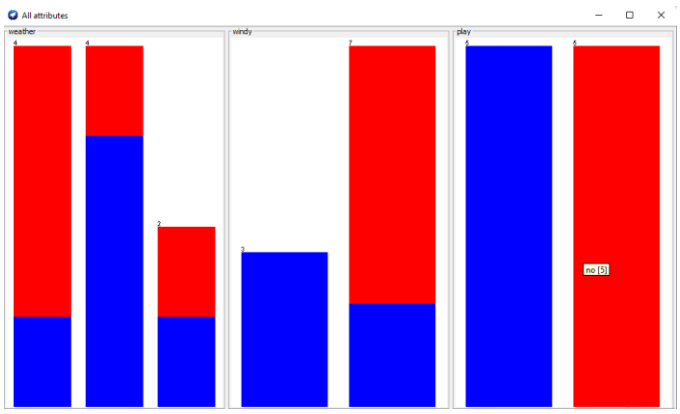
@attribute weather{sunny,rainy,cloudy}
@attribute temparature numeric
@attribute humidity numeric
@attribute windy{true,false}
@attribute play{yes,no}

@data
sunny,56.00,57.00,false,no
cloudy,76.00,67.00,true,yes
sunny,54.00,98.00,false,no
rainy,76.00,94.00,false,yes
rainy,43.00,75.00,false,no
rainy,35.00,46.00,true,yes
cloudy,67.00,25.00,false,no
sunny,45.00,78.00,true,yes
sunny,43.00,45.00,false,no
rainy,67.00,87.00,false,yes

Viewer

Relation: weather-weka.filters.unsupervised.attribute.RemoveType-V-Tnominal

No.	1: weather Nominal	2: windy Nominal	3: **play** Nominal
1	sunny	false	no
2	cloudy	true	yes
3	sunny	false	no
4	rainy	false	yes
5	rainy	false	no
6	rainy	true	yes
7	cloudy	false	no
8	sunny	true	yes
9	sunny	false	no
10	rainy	false	yes



`

EX. NO. :4-(A)
DATE :

Mine Association Rule for E-Commerce Dataset

@relation buying

@attribute age{L20,20-40,G40}
@attribute income{high,medium,low}
@attribute stud{yes,no}
@attribute creditrate{fair,excellent}
@attribute buyscomp{yes,no}
@data

L20,high,no,fair,yes
20-40,low,yes,fair,yes
G40,medium,yes,fair,yes
L20,low,yes,fair,yes
20-40,high,yes,excellent,no
G40,low,no,fair,yes
L20,high,yes,excellent,no
G40,high,no,fair,yes
L20,low,yes,excellent,no
G40,high,yes,excellent,yes
20-40,medium,yes,excellent,yes
L20,medium,yes,fair,yes
G40,high,yes,excellent,yes

Associator output

```
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.2 (20 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 16

Generated sets of large itemsets:

Size of set of large itemsets L(1): 22

Size of set of large itemsets L(2): 182

Size of set of large itemsets L(3): 56

Best rules found:

 1. a1=false a5=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 2. a5=false a8=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 3. a5=false a6=false 23 ==> class=c0 23    <conf:(1)> lift:(1.52) lev:(0.08) [7] conv:(7.82)
 4. a8=false class=c1 22 ==> a5=true 22    <conf:(1)> lift:(1.79) lev:(0.1) [9] conv:(9.68)
 5. a5=false a7=true 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 6. a5=false a9=false 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 7. a3=false a5=false 20 ==> class=c0 20    <conf:(1)> lift:(1.52) lev:(0.07) [6] conv:(6.8)
 8. a6=false class=c1 20 ==> a5=true 20    <conf:(1)> lift:(1.79) lev:(0.09) [8] conv:(8.8)
 9. a2=false a5=false 27 ==> class=c0 26    <conf:(0.96)> lift:(1.46) lev:(0.08) [8] conv:(4.59)
10. a4=false a5=false 23 ==> class=c0 22    <conf:(0.96)> lift:(1.45) lev:(0.07) [6] conv:(3.91)
```

`

EX. NO. :4-(B)
DATE :

Mine Association Rule for Banking Dataset

@relation bank

@attribute accno{01,02,03,04,05}
@attribute cust{male,female}
@attribute bankname{sbi,hdfc,sbh,ab,rbi}
@attribute location{hyd,jmd,antp,pdtr,kdp}
@attribute deposit{yes,no}
@data

01,male,sbi,hyd,yes
02,male,hdfc,jmd,no
03,male,sbh,antp,yes
04,female,ab,pdtr,yes
05,female,sbi,jmd,no

Associator output

```
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.2 (20 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 16

Generated sets of large itemsets:

Size of set of large itemsets L(1): 22

Size of set of large itemsets L(2): 182

Size of set of large itemsets L(3): 56

Best rules found:

 1. a1=false a5=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 2. a5=false a8=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 3. a5=false a6=false 23 ==> class=c0 23    <conf:(1)> lift:(1.52) lev:(0.08) [7] conv:(7.82)
 4. a8=false class=c1 22 ==> a5=true 22    <conf:(1)> lift:(1.79) lev:(0.1) [9] conv:(9.68)
 5. a5=false a7=true 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 6. a5=false a9=false 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 7. a3=false a5=false 20 ==> class=c0 20    <conf:(1)> lift:(1.52) lev:(0.07) [6] conv:(6.8)
 8. a6=false class=c1 20 ==> a5=true 20    <conf:(1)> lift:(1.79) lev:(0.09) [8] conv:(8.8)
 9. a2=false a5=false 27 ==> class=c0 26    <conf:(0.96)> lift:(1.46) lev:(0.08) [8] conv:(4.59)
10. a4=false a5=false 23 ==> class=c0 22    <conf:(0.96)> lift:(1.45) lev:(0.07) [6] conv:(3.91)
```

`

EX. NO. :4-(C)
DATE :

Mine Association Rule for Employee Dataset

@relation employeedata

@attribute age{youth,middle,senior}
@attribute income{high,medium,low}
@attribute class{a,b,c}
@data

youth,high,a
youth,medium,b
youth,low,c
middle,low,c
middle,medium,c
middle,high,a
senior,low,c
senior,medium,b
senior,high,b
middle,high,b

Associator output

```
=== Associator model (full training set) ===


Apriori
=======

Minimum support: 0.2 (20 instances)
Minimum metric <confidence>: 0.9
Number of cycles performed: 16

Generated sets of large itemsets:

Size of set of large itemsets L(1): 22

Size of set of large itemsets L(2): 182

Size of set of large itemsets L(3): 56

Best rules found:

 1. a1=false a5=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 2. a5=false a8=false 24 ==> class=c0 24    <conf:(1)> lift:(1.52) lev:(0.08) [8] conv:(8.16)
 3. a5=false a6=false 23 ==> class=c0 23    <conf:(1)> lift:(1.52) lev:(0.08) [7] conv:(7.82)
 4. a8=false class=c1 22 ==> a5=true 22    <conf:(1)> lift:(1.79) lev:(0.1) [9] conv:(9.68)
 5. a5=false a7=true 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 6. a5=false a9=false 21 ==> class=c0 21    <conf:(1)> lift:(1.52) lev:(0.07) [7] conv:(7.14)
 7. a3=false a5=false 20 ==> class=c0 20    <conf:(1)> lift:(1.52) lev:(0.07) [6] conv:(6.8)
 8. a6=false class=c1 20 ==> a5=true 20    <conf:(1)> lift:(1.79) lev:(0.09) [8] conv:(8.8)
 9. a2=false a5=false 27 ==> class=c0 26    <conf:(0.96)> lift:(1.46) lev:(0.08) [8] conv:(4.59)
10. a4=false a5=false 23 ==> class=c0 22    <conf:(0.96)> lift:(1.45) lev:(0.07) [6] conv:(3.91)
```

`

EX. NO. :5
DATE :

Perform Cluster analysis for a Customer Dataset

@relation customer

@attribute name{x,y,z,u,v,i,w,q,r,n}
@attribute age{youth,middle,senior}
@attribute income{high,midium,low}
@attribute class{a,b}
@data

x,youth,high,a
y,youth,low,b
z,middle,high,a
u,middle,low,b
v,senior,high,a
i,senior,low,b
w,youth,high,a
q,youth,low,b
r,middle,high,a
n,senior,high,a

Clusterer output

```
=== Run information ===

Scheme:       weka.clusterers.EM -I 100 -N -1 -X 10 -max -1 -ll-cv 1.0E-6 -ll-iter 1.0E-6 -M 1.0E-6 -K 10 -num-slots 1 -S 100
Relation:     weka.datagenerators.classifiers.classification.RDG1-S_1_-n_100_-a_10_-c_2_-N_0_-I_0_-M_1_-R_10
Instances:    100
Attributes:   11
              a0
              a1
              a2
              a3
              a4
              a5
              a6
              a7
              a8
              a9
              class
Test mode:    evaluate on training data


=== Clustering model (full training set) ===


EM
==

Number of clusters selected by cross validation: 2
Number of iterations performed: 40


                Cluster
Attribute         0       1
```


Clusterer output

```
                Cluster
Attribute         0       1
                (0.66)  (0.34)
============================
a0
  false       30.2327 17.7673
  true        37.8843 18.1157
  [total]      68.117  35.883
a1
  false       32.2914 20.7086
  true        35.8256 15.1744
  [total]      68.117  35.883
a2
  false       42.1239 17.8761
  true         25.993  18.007
  [total]      68.117  35.883
a3
  false        31.781   9.219
  true        36.3359 26.6641
  [total]      68.117  35.883
a4
  false       36.1452 19.8548
  true        31.9718 16.0282
  [total]      68.117  35.883
a5
  false       44.4417  1.5583
  true        23.6753 34.3247
  [total]      68.117  35.883
a6
  false       34.9386 22.0614
  true        33.1784 13.8216
  [total]      68.117  35.883
```

Clusterer output

```
  [total]      68.117  35.883
a7
  false        37.364  14.636
  true         30.753  21.247
  [total]      68.117  35.883
a8
  false       30.5993 23.4007
  true        37.5176 12.4824
  [total]      68.117  35.883
a9
  false       34.0715 16.9285
  true        34.0454 18.9546
  [total]      68.117  35.883
class
  c0          64.3561  3.6439
  c1           3.7609 32.2391
  [total]      68.117  35.883


Time taken to build model (full training data) : 0.28 seconds

=== Model and evaluation on training set ===

Clustered Instances

0       68 ( 68%)
1       32 ( 32%)


Log likelihood: -7.28232
```

`

EX. NO. :6-(A)

DATE :

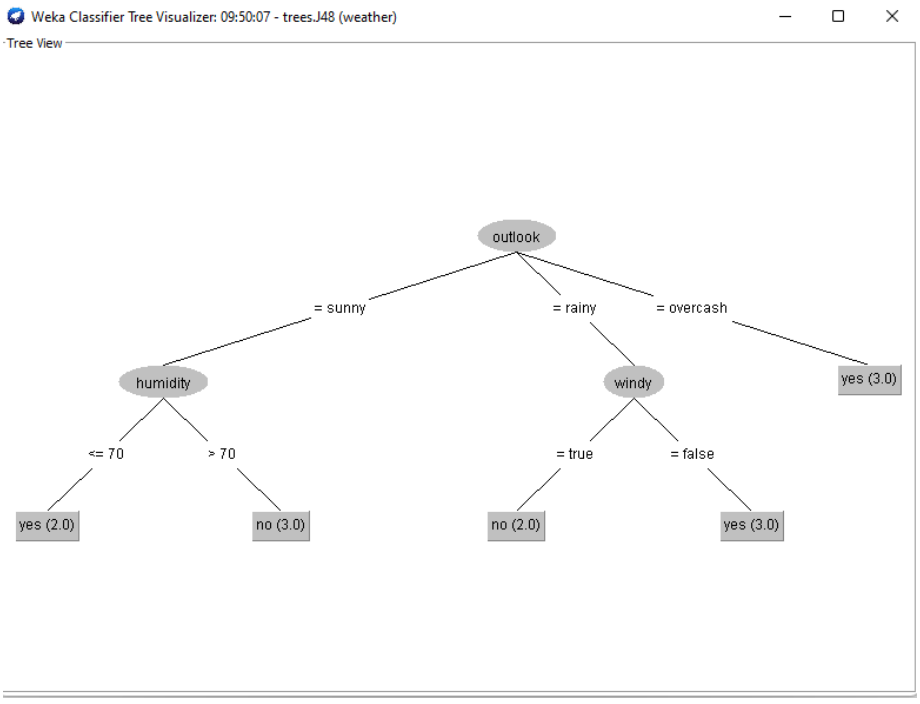
Perform classification and build a Decision Tree for Weather Dataset

---

@relation weather

@attribute outlook{sunny,rainy,overcash}
@attribute temperature numeric
@attribute humidity numeric
@attribute windy{true,false}
@attribute play{yes,no}
@data

sunny,85,85,false,no
sunny,80,90,true,no
overcash,83,86,false,yes
rainy,70,96,false,yes
rainy,68,80,false,yes
rainy,65,70,true,no
overcash,64,65,true,yes
sunny,72,95,false,no
sunny,69,70,false,yes
rainy,75,80,false,yes
sunny,75,70,true,yes
overcash,72,90,true,yes
rainy,71,91,true,no



`

EX. NO. :6-(B)

DATE :

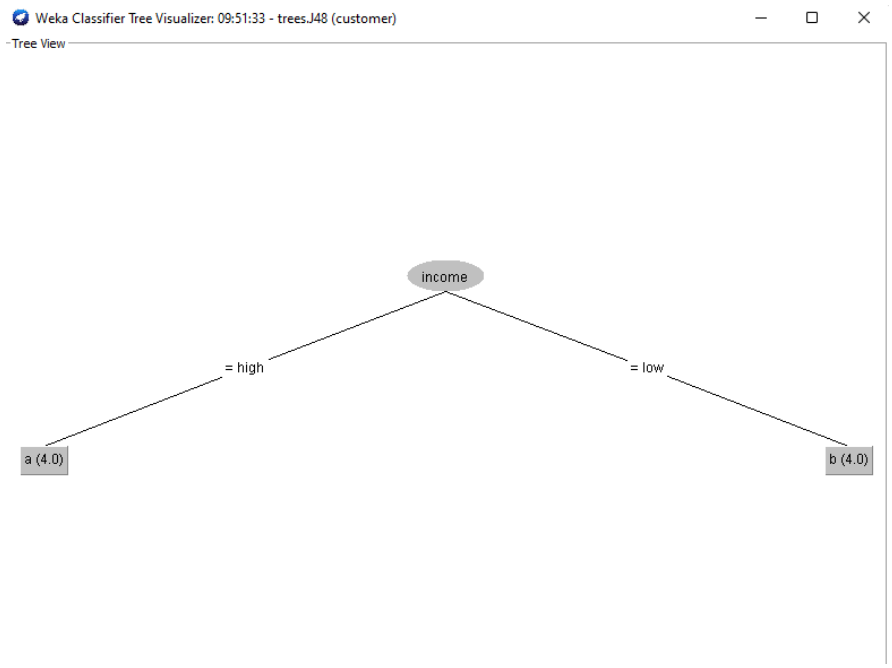
Perform classification and build a Decision Tree for Customer Dataset

---

```
@relation customer

@attribute name{"pandi","yogi","murali","kumar",A,B,C,D}
@attribute age{"youth","middle","seniur"}
@attribute income{"high","low"}
@attribute class{'a','b'}
@data

pandi,youth,high,a
yogi,youth,low,b
murali,middle,low,b
kumar,seniur,high,a
A,youth,high,a
B,youth,low,b
C,middle,low,b
D,seniur,high,a
```



`

EX. NO. :6-(C)

DATE :

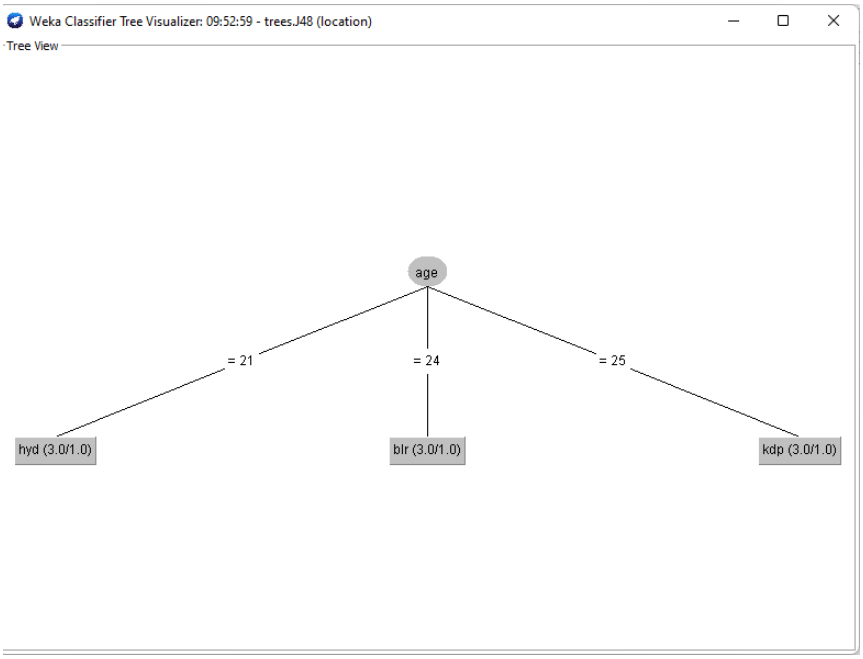
Perform classification and build a Decision Tree for Geographical Location Dataset

---

@relation location

@attribute age{21,24,25}
@attribute location{hyd,blr,kdp}
@data

21,hyd
21,hyd
24,blr
24,blr
24,hyd
21,kdp
25,hyd
25,kdp
25,kdp



`

EX. NO. :6-(D)

DATE :

Perform classification and build a Decision Tree for Iris Dataset

---

@relation iris

@attribute sepallength real
@attribute sepalwidth real
@attribute petallength real
@attribute petalwidth real
@attribute class{iris_setosa,iris_versicolor,iris_virginica}
@data

5.1,3.5,1.4,0.2,iris_setosa
4.9,3.0,1.4,0.2,iris_setosa
4.7,3.2,1.3,0.2,iris_versicolor
4.6,3.1,1.5,0.2,iris_versicolor
5.0,3.6,1.4,0.2,iris_setosa
5.4,3.9,1.7,0.4,iris_virginica
7.0,3.2,4.7,1.4,iris_virginica
6.4,3.2,4.5,1.5,iris_virginica
6.9,3.1,4.9,1.5,iris_setosa
5.5,2.3,4.0,1.3,iris_versicolor
6.5,2.8,4.6,1.5,iris_versicolor
5.7,2.8,4.5,1.3,iris_setosa
6.3,3.3,6.0,2.5,iris_virginica