

iris.R

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```
mydata3=read.table("C:/Users/91939/Desktop/1st-MCA/R/iris.txt",header=TRUE,sep=",")
iris=mydata3
str(iris)
```

```
## 'data.frame': 150 obs. of 5 variables:
## $ Sepal.Length: num 5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
## $ Sepal.Width : num 3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
## $ Petal.Length: num 1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
## $ Petal.Width : num 0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
## $ Species : chr "Iris-setosa" "Iris-setosa" "Iris-setosa" "Iris-setosa" ...
```

```
#how many variables and observations does the dataset have?
dim(iris)
```

```
## [1] 150 5
```

```
#Create a dataframe by extracting first three variables of dataset
iris[,c(1,2,3)]
```

```
##      Sepal.Length Sepal.Width Petal.Length
## 1           5.1           3.5           1.4
## 2           4.9           3.0           1.4
## 3           4.7           3.2           1.3
## 4           4.6           3.1           1.5
## 5           5.0           3.6           1.4
## 6           5.4           3.9           1.7
## 7           4.6           3.4           1.4
## 8           5.0           3.4           1.5
## 9           4.4           2.9           1.4
## 10          4.9           3.1           1.5
## 11          5.4           3.7           1.5
## 12          4.8           3.4           1.6
## 13          4.8           3.0           1.4
## 14          4.3           3.0           1.1
## 15          5.8           4.0           1.2
## 16          5.7           4.4           1.5
## 17          5.4           3.9           1.3
## 18          5.1           3.5           1.4
## 19          5.7           3.8           1.7
## 20          5.1           3.8           1.5
```

## 21	5.4	3.4	1.7
## 22	5.1	3.7	1.5
## 23	4.6	3.6	1.0
## 24	5.1	3.3	1.7
## 25	4.8	3.4	1.9
## 26	5.0	3.0	1.6
## 27	5.0	3.4	1.6
## 28	5.2	3.5	1.5
## 29	5.2	3.4	1.4
## 30	4.7	3.2	1.6
## 31	4.8	3.1	1.6
## 32	5.4	3.4	1.5
## 33	5.2	4.1	1.5
## 34	5.5	4.2	1.4
## 35	4.9	3.1	1.5
## 36	5.0	3.2	1.2
## 37	5.5	3.5	1.3
## 38	4.9	3.1	1.5
## 39	4.4	3.0	1.3
## 40	5.1	3.4	1.5
## 41	5.0	3.5	1.3
## 42	4.5	2.3	1.3
## 43	4.4	3.2	1.3
## 44	5.0	3.5	1.6
## 45	5.1	3.8	1.9
## 46	4.8	3.0	1.4
## 47	5.1	3.8	1.6
## 48	4.6	3.2	1.4
## 49	5.3	3.7	1.5
## 50	5.0	3.3	1.4
## 51	7.0	3.2	4.7
## 52	6.4	3.2	4.5
## 53	6.9	3.1	4.9
## 54	5.5	2.3	4.0
## 55	6.5	2.8	4.6
## 56	5.7	2.8	4.5
## 57	6.3	3.3	4.7
## 58	4.9	2.4	3.3
## 59	6.6	2.9	4.6
## 60	5.2	2.7	3.9
## 61	5.0	2.0	3.5
## 62	5.9	3.0	4.2
## 63	6.0	2.2	4.0
## 64	6.1	2.9	4.7
## 65	5.6	2.9	3.6
## 66	6.7	3.1	4.4
## 67	5.6	3.0	4.5
## 68	5.8	2.7	4.1
## 69	6.2	2.2	4.5
## 70	5.6	2.5	3.9
## 71	5.9	3.2	4.8
## 72	6.1	2.8	4.0
## 73	6.3	2.5	4.9
## 74	6.1	2.8	4.7

## 75	6.4	2.9	4.3
## 76	6.6	3.0	4.4
## 77	6.8	2.8	4.8
## 78	6.7	3.0	5.0
## 79	6.0	2.9	4.5
## 80	5.7	2.6	3.5
## 81	5.5	2.4	3.8
## 82	5.5	2.4	3.7
## 83	5.8	2.7	3.9
## 84	6.0	2.7	5.1
## 85	5.4	3.0	4.5
## 86	6.0	3.4	4.5
## 87	6.7	3.1	4.7
## 88	6.3	2.3	4.4
## 89	5.6	3.0	4.1
## 90	5.5	2.5	4.0
## 91	5.5	2.6	4.4
## 92	6.1	3.0	4.6
## 93	5.8	2.6	4.0
## 94	5.0	2.3	3.3
## 95	5.6	2.7	4.2
## 96	5.7	3.0	4.2
## 97	5.7	2.9	4.2
## 98	6.2	2.9	4.3
## 99	5.1	2.5	3.0
## 100	5.7	2.8	4.1
## 101	6.3	3.3	6.0
## 102	5.8	2.7	5.1
## 103	7.1	3.0	5.9
## 104	6.3	2.9	5.6
## 105	6.5	3.0	5.8
## 106	7.6	3.0	6.6
## 107	4.9	2.5	4.5
## 108	7.3	2.9	6.3
## 109	6.7	2.5	5.8
## 110	7.2	3.6	6.1
## 111	6.5	3.2	5.1
## 112	6.4	2.7	5.3
## 113	6.8	3.0	5.5
## 114	5.7	2.5	5.0
## 115	5.8	2.8	5.1
## 116	6.4	3.2	5.3
## 117	6.5	3.0	5.5
## 118	7.7	3.8	6.7
## 119	7.7	2.6	6.9
## 120	6.0	2.2	5.0
## 121	6.9	3.2	5.7
## 122	5.6	2.8	4.9
## 123	7.7	2.8	6.7
## 124	6.3	2.7	4.9
## 125	6.7	3.3	5.7
## 126	7.2	3.2	6.0
## 127	6.2	2.8	4.8
## 128	6.1	3.0	4.9

```
## 129      6.4      2.8      5.6
## 130      7.2      3.0      5.8
## 131      7.4      2.8      6.1
## 132      7.9      3.8      6.4
## 133      6.4      2.8      5.6
## 134      6.3      2.8      5.1
## 135      6.1      2.6      5.6
## 136      7.7      3.0      6.1
## 137      6.3      3.4      5.6
## 138      6.4      3.1      5.5
## 139      6.0      3.0      4.8
## 140      6.9      3.1      5.4
## 141      6.7      3.1      5.6
## 142      6.9      3.1      5.1
## 143      5.8      2.7      5.1
## 144      6.8      3.2      5.9
## 145      6.7      3.3      5.7
## 146      6.7      3.0      5.2
## 147      6.3      2.5      5.0
## 148      6.5      3.0      5.2
## 149      6.2      3.4      5.4
## 150      5.9      3.0      5.1
```

```
#Display all the columns of the iris dataset except Petal Width
iris[,-4]
```

```
##      Sepal.Length Sepal.Width Petal.Length      Species
## 1          5.1          3.5          1.4      Iris-setosa
## 2          4.9          3.0          1.4      Iris-setosa
## 3          4.7          3.2          1.3      Iris-setosa
## 4          4.6          3.1          1.5      Iris-setosa
## 5          5.0          3.6          1.4      Iris-setosa
## 6          5.4          3.9          1.7      Iris-setosa
## 7          4.6          3.4          1.4      Iris-setosa
## 8          5.0          3.4          1.5      Iris-setosa
## 9          4.4          2.9          1.4      Iris-setosa
## 10         4.9          3.1          1.5      Iris-setosa
## 11         5.4          3.7          1.5      Iris-setosa
## 12         4.8          3.4          1.6      Iris-setosa
## 13         4.8          3.0          1.4      Iris-setosa
## 14         4.3          3.0          1.1      Iris-setosa
## 15         5.8          4.0          1.2      Iris-setosa
## 16         5.7          4.4          1.5      Iris-setosa
## 17         5.4          3.9          1.3      Iris-setosa
## 18         5.1          3.5          1.4      Iris-setosa
## 19         5.7          3.8          1.7      Iris-setosa
## 20         5.1          3.8          1.5      Iris-setosa
## 21         5.4          3.4          1.7      Iris-setosa
## 22         5.1          3.7          1.5      Iris-setosa
## 23         4.6          3.6          1.0      Iris-setosa
## 24         5.1          3.3          1.7      Iris-setosa
## 25         4.8          3.4          1.9      Iris-setosa
## 26         5.0          3.0          1.6      Iris-setosa
## 27         5.0          3.4          1.6      Iris-setosa
```

## 28	5.2	3.5	1.5	Iris-setosa
## 29	5.2	3.4	1.4	Iris-setosa
## 30	4.7	3.2	1.6	Iris-setosa
## 31	4.8	3.1	1.6	Iris-setosa
## 32	5.4	3.4	1.5	Iris-setosa
## 33	5.2	4.1	1.5	Iris-setosa
## 34	5.5	4.2	1.4	Iris-setosa
## 35	4.9	3.1	1.5	Iris-setosa
## 36	5.0	3.2	1.2	Iris-setosa
## 37	5.5	3.5	1.3	Iris-setosa
## 38	4.9	3.1	1.5	Iris-setosa
## 39	4.4	3.0	1.3	Iris-setosa
## 40	5.1	3.4	1.5	Iris-setosa
## 41	5.0	3.5	1.3	Iris-setosa
## 42	4.5	2.3	1.3	Iris-setosa
## 43	4.4	3.2	1.3	Iris-setosa
## 44	5.0	3.5	1.6	Iris-setosa
## 45	5.1	3.8	1.9	Iris-setosa
## 46	4.8	3.0	1.4	Iris-setosa
## 47	5.1	3.8	1.6	Iris-setosa
## 48	4.6	3.2	1.4	Iris-setosa
## 49	5.3	3.7	1.5	Iris-setosa
## 50	5.0	3.3	1.4	Iris-setosa
## 51	7.0	3.2	4.7	Iris-versicolor
## 52	6.4	3.2	4.5	Iris-versicolor
## 53	6.9	3.1	4.9	Iris-versicolor
## 54	5.5	2.3	4.0	Iris-versicolor
## 55	6.5	2.8	4.6	Iris-versicolor
## 56	5.7	2.8	4.5	Iris-versicolor
## 57	6.3	3.3	4.7	Iris-versicolor
## 58	4.9	2.4	3.3	Iris-versicolor
## 59	6.6	2.9	4.6	Iris-versicolor
## 60	5.2	2.7	3.9	Iris-versicolor
## 61	5.0	2.0	3.5	Iris-versicolor
## 62	5.9	3.0	4.2	Iris-versicolor
## 63	6.0	2.2	4.0	Iris-versicolor
## 64	6.1	2.9	4.7	Iris-versicolor
## 65	5.6	2.9	3.6	Iris-versicolor
## 66	6.7	3.1	4.4	Iris-versicolor
## 67	5.6	3.0	4.5	Iris-versicolor
## 68	5.8	2.7	4.1	Iris-versicolor
## 69	6.2	2.2	4.5	Iris-versicolor
## 70	5.6	2.5	3.9	Iris-versicolor
## 71	5.9	3.2	4.8	Iris-versicolor
## 72	6.1	2.8	4.0	Iris-versicolor
## 73	6.3	2.5	4.9	Iris-versicolor
## 74	6.1	2.8	4.7	Iris-versicolor
## 75	6.4	2.9	4.3	Iris-versicolor
## 76	6.6	3.0	4.4	Iris-versicolor
## 77	6.8	2.8	4.8	Iris-versicolor
## 78	6.7	3.0	5.0	Iris-versicolor
## 79	6.0	2.9	4.5	Iris-versicolor
## 80	5.7	2.6	3.5	Iris-versicolor
## 81	5.5	2.4	3.8	Iris-versicolor

## 82	5.5	2.4	3.7 Iris-versicolor
## 83	5.8	2.7	3.9 Iris-versicolor
## 84	6.0	2.7	5.1 Iris-versicolor
## 85	5.4	3.0	4.5 Iris-versicolor
## 86	6.0	3.4	4.5 Iris-versicolor
## 87	6.7	3.1	4.7 Iris-versicolor
## 88	6.3	2.3	4.4 Iris-versicolor
## 89	5.6	3.0	4.1 Iris-versicolor
## 90	5.5	2.5	4.0 Iris-versicolor
## 91	5.5	2.6	4.4 Iris-versicolor
## 92	6.1	3.0	4.6 Iris-versicolor
## 93	5.8	2.6	4.0 Iris-versicolor
## 94	5.0	2.3	3.3 Iris-versicolor
## 95	5.6	2.7	4.2 Iris-versicolor
## 96	5.7	3.0	4.2 Iris-versicolor
## 97	5.7	2.9	4.2 Iris-versicolor
## 98	6.2	2.9	4.3 Iris-versicolor
## 99	5.1	2.5	3.0 Iris-versicolor
## 100	5.7	2.8	4.1 Iris-versicolor
## 101	6.3	3.3	6.0 Iris-virginica
## 102	5.8	2.7	5.1 Iris-virginica
## 103	7.1	3.0	5.9 Iris-virginica
## 104	6.3	2.9	5.6 Iris-virginica
## 105	6.5	3.0	5.8 Iris-virginica
## 106	7.6	3.0	6.6 Iris-virginica
## 107	4.9	2.5	4.5 Iris-virginica
## 108	7.3	2.9	6.3 Iris-virginica
## 109	6.7	2.5	5.8 Iris-virginica
## 110	7.2	3.6	6.1 Iris-virginica
## 111	6.5	3.2	5.1 Iris-virginica
## 112	6.4	2.7	5.3 Iris-virginica
## 113	6.8	3.0	5.5 Iris-virginica
## 114	5.7	2.5	5.0 Iris-virginica
## 115	5.8	2.8	5.1 Iris-virginica
## 116	6.4	3.2	5.3 Iris-virginica
## 117	6.5	3.0	5.5 Iris-virginica
## 118	7.7	3.8	6.7 Iris-virginica
## 119	7.7	2.6	6.9 Iris-virginica
## 120	6.0	2.2	5.0 Iris-virginica
## 121	6.9	3.2	5.7 Iris-virginica
## 122	5.6	2.8	4.9 Iris-virginica
## 123	7.7	2.8	6.7 Iris-virginica
## 124	6.3	2.7	4.9 Iris-virginica
## 125	6.7	3.3	5.7 Iris-virginica
## 126	7.2	3.2	6.0 Iris-virginica
## 127	6.2	2.8	4.8 Iris-virginica
## 128	6.1	3.0	4.9 Iris-virginica
## 129	6.4	2.8	5.6 Iris-virginica
## 130	7.2	3.0	5.8 Iris-virginica
## 131	7.4	2.8	6.1 Iris-virginica
## 132	7.9	3.8	6.4 Iris-virginica
## 133	6.4	2.8	5.6 Iris-virginica
## 134	6.3	2.8	5.1 Iris-virginica
## 135	6.1	2.6	5.6 Iris-virginica

```
## 136      7.7      3.0      6.1 Iris-virginica
## 137      6.3      3.4      5.6 Iris-virginica
## 138      6.4      3.1      5.5 Iris-virginica
## 139      6.0      3.0      4.8 Iris-virginica
## 140      6.9      3.1      5.4 Iris-virginica
## 141      6.7      3.1      5.6 Iris-virginica
## 142      6.9      3.1      5.1 Iris-virginica
## 143      5.8      2.7      5.1 Iris-virginica
## 144      6.8      3.2      5.9 Iris-virginica
## 145      6.7      3.3      5.7 Iris-virginica
## 146      6.7      3.0      5.2 Iris-virginica
## 147      6.3      2.5      5.0 Iris-virginica
## 148      6.5      3.0      5.2 Iris-virginica
## 149      6.2      3.4      5.4 Iris-virginica
## 150      5.9      3.0      5.1 Iris-virginica
```

```
#Display all columns of iris dataset that starts with character string P(String not thought)
```

```
#Display the rows of iris dataset for Sepal.Length>=4.6 and Petal.Width>=0.5. How many such observations
```

```
iris_sub=iris[iris$Sepal.Length >= 4.6 & iris$Petal.Width >= 0.5, ]
iris_sub
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width      Species
## 24          5.1         3.3         1.7         0.5      Iris-setosa
## 44          5.0         3.5         1.6         0.6      Iris-setosa
## 51          7.0         3.2         4.7         1.4 Iris-versicolor
## 52          6.4         3.2         4.5         1.5 Iris-versicolor
## 53          6.9         3.1         4.9         1.5 Iris-versicolor
## 54          5.5         2.3         4.0         1.3 Iris-versicolor
## 55          6.5         2.8         4.6         1.5 Iris-versicolor
## 56          5.7         2.8         4.5         1.3 Iris-versicolor
## 57          6.3         3.3         4.7         1.6 Iris-versicolor
## 58          4.9         2.4         3.3         1.0 Iris-versicolor
## 59          6.6         2.9         4.6         1.3 Iris-versicolor
## 60          5.2         2.7         3.9         1.4 Iris-versicolor
## 61          5.0         2.0         3.5         1.0 Iris-versicolor
## 62          5.9         3.0         4.2         1.5 Iris-versicolor
## 63          6.0         2.2         4.0         1.0 Iris-versicolor
## 64          6.1         2.9         4.7         1.4 Iris-versicolor
## 65          5.6         2.9         3.6         1.3 Iris-versicolor
## 66          6.7         3.1         4.4         1.4 Iris-versicolor
## 67          5.6         3.0         4.5         1.5 Iris-versicolor
## 68          5.8         2.7         4.1         1.0 Iris-versicolor
## 69          6.2         2.2         4.5         1.5 Iris-versicolor
## 70          5.6         2.5         3.9         1.1 Iris-versicolor
## 71          5.9         3.2         4.8         1.8 Iris-versicolor
## 72          6.1         2.8         4.0         1.3 Iris-versicolor
## 73          6.3         2.5         4.9         1.5 Iris-versicolor
## 74          6.1         2.8         4.7         1.2 Iris-versicolor
## 75          6.4         2.9         4.3         1.3 Iris-versicolor
## 76          6.6         3.0         4.4         1.4 Iris-versicolor
## 77          6.8         2.8         4.8         1.4 Iris-versicolor
## 78          6.7         3.0         5.0         1.7 Iris-versicolor
## 79          6.0         2.9         4.5         1.5 Iris-versicolor
```

## 80	5.7	2.6	3.5	1.0 Iris-versicolor
## 81	5.5	2.4	3.8	1.1 Iris-versicolor
## 82	5.5	2.4	3.7	1.0 Iris-versicolor
## 83	5.8	2.7	3.9	1.2 Iris-versicolor
## 84	6.0	2.7	5.1	1.6 Iris-versicolor
## 85	5.4	3.0	4.5	1.5 Iris-versicolor
## 86	6.0	3.4	4.5	1.6 Iris-versicolor
## 87	6.7	3.1	4.7	1.5 Iris-versicolor
## 88	6.3	2.3	4.4	1.3 Iris-versicolor
## 89	5.6	3.0	4.1	1.3 Iris-versicolor
## 90	5.5	2.5	4.0	1.3 Iris-versicolor
## 91	5.5	2.6	4.4	1.2 Iris-versicolor
## 92	6.1	3.0	4.6	1.4 Iris-versicolor
## 93	5.8	2.6	4.0	1.2 Iris-versicolor
## 94	5.0	2.3	3.3	1.0 Iris-versicolor
## 95	5.6	2.7	4.2	1.3 Iris-versicolor
## 96	5.7	3.0	4.2	1.2 Iris-versicolor
## 97	5.7	2.9	4.2	1.3 Iris-versicolor
## 98	6.2	2.9	4.3	1.3 Iris-versicolor
## 99	5.1	2.5	3.0	1.1 Iris-versicolor
## 100	5.7	2.8	4.1	1.3 Iris-versicolor
## 101	6.3	3.3	6.0	2.5 Iris-virginica
## 102	5.8	2.7	5.1	1.9 Iris-virginica
## 103	7.1	3.0	5.9	2.1 Iris-virginica
## 104	6.3	2.9	5.6	1.8 Iris-virginica
## 105	6.5	3.0	5.8	2.2 Iris-virginica
## 106	7.6	3.0	6.6	2.1 Iris-virginica
## 107	4.9	2.5	4.5	1.7 Iris-virginica
## 108	7.3	2.9	6.3	1.8 Iris-virginica
## 109	6.7	2.5	5.8	1.8 Iris-virginica
## 110	7.2	3.6	6.1	2.5 Iris-virginica
## 111	6.5	3.2	5.1	2.0 Iris-virginica
## 112	6.4	2.7	5.3	1.9 Iris-virginica
## 113	6.8	3.0	5.5	2.1 Iris-virginica
## 114	5.7	2.5	5.0	2.0 Iris-virginica
## 115	5.8	2.8	5.1	2.4 Iris-virginica
## 116	6.4	3.2	5.3	2.3 Iris-virginica
## 117	6.5	3.0	5.5	1.8 Iris-virginica
## 118	7.7	3.8	6.7	2.2 Iris-virginica
## 119	7.7	2.6	6.9	2.3 Iris-virginica
## 120	6.0	2.2	5.0	1.5 Iris-virginica
## 121	6.9	3.2	5.7	2.3 Iris-virginica
## 122	5.6	2.8	4.9	2.0 Iris-virginica
## 123	7.7	2.8	6.7	2.0 Iris-virginica
## 124	6.3	2.7	4.9	1.8 Iris-virginica
## 125	6.7	3.3	5.7	2.1 Iris-virginica
## 126	7.2	3.2	6.0	1.8 Iris-virginica
## 127	6.2	2.8	4.8	1.8 Iris-virginica
## 128	6.1	3.0	4.9	1.8 Iris-virginica
## 129	6.4	2.8	5.6	2.1 Iris-virginica
## 130	7.2	3.0	5.8	1.6 Iris-virginica
## 131	7.4	2.8	6.1	1.9 Iris-virginica
## 132	7.9	3.8	6.4	2.0 Iris-virginica
## 133	6.4	2.8	5.6	2.2 Iris-virginica



```
## 134      6.3      2.8      5.1      1.5 Iris-virginica
## 135      6.1      2.6      5.6      1.4 Iris-virginica
## 136      7.7      3.0      6.1      2.3 Iris-virginica
## 137      6.3      3.4      5.6      2.4 Iris-virginica
## 138      6.4      3.1      5.5      1.8 Iris-virginica
## 139      6.0      3.0      4.8      1.8 Iris-virginica
## 140      6.9      3.1      5.4      2.1 Iris-virginica
## 141      6.7      3.1      5.6      2.4 Iris-virginica
## 142      6.9      3.1      5.1      2.3 Iris-virginica
## 143      5.8      2.7      5.1      1.9 Iris-virginica
## 144      6.8      3.2      5.9      2.3 Iris-virginica
## 145      6.7      3.3      5.7      2.5 Iris-virginica
## 146      6.7      3.0      5.2      2.3 Iris-virginica
## 147      6.3      2.5      5.0      1.9 Iris-virginica
## 148      6.5      3.0      5.2      2.0 Iris-virginica
## 149      6.2      3.4      5.4      2.3 Iris-virginica
## 150      5.9      3.0      5.1      1.8 Iris-virginica
```

```
nrow(iris_sub)
```

```
## [1] 102
```

```
#Create a DataFrame iris1 that contains only the sepal details of Setosa Species
iris1=iris[iris$Species=="Iris-setosa",]
iris1=iris1[,c(1,2,5)]
iris1
```

```
##      Sepal.Length Sepal.Width      Species
## 1          5.1          3.5 Iris-setosa
## 2          4.9          3.0 Iris-setosa
## 3          4.7          3.2 Iris-setosa
## 4          4.6          3.1 Iris-setosa
## 5          5.0          3.6 Iris-setosa
## 6          5.4          3.9 Iris-setosa
## 7          4.6          3.4 Iris-setosa
## 8          5.0          3.4 Iris-setosa
## 9          4.4          2.9 Iris-setosa
## 10         4.9          3.1 Iris-setosa
## 11         5.4          3.7 Iris-setosa
## 12         4.8          3.4 Iris-setosa
## 13         4.8          3.0 Iris-setosa
## 14         4.3          3.0 Iris-setosa
## 15         5.8          4.0 Iris-setosa
## 16         5.7          4.4 Iris-setosa
## 17         5.4          3.9 Iris-setosa
## 18         5.1          3.5 Iris-setosa
## 19         5.7          3.8 Iris-setosa
## 20         5.1          3.8 Iris-setosa
## 21         5.4          3.4 Iris-setosa
## 22         5.1          3.7 Iris-setosa
## 23         4.6          3.6 Iris-setosa
## 24         5.1          3.3 Iris-setosa
## 25         4.8          3.4 Iris-setosa
```

```
## 26      5.0      3.0 Iris-setosa
## 27      5.0      3.4 Iris-setosa
## 28      5.2      3.5 Iris-setosa
## 29      5.2      3.4 Iris-setosa
## 30      4.7      3.2 Iris-setosa
## 31      4.8      3.1 Iris-setosa
## 32      5.4      3.4 Iris-setosa
## 33      5.2      4.1 Iris-setosa
## 34      5.5      4.2 Iris-setosa
## 35      4.9      3.1 Iris-setosa
## 36      5.0      3.2 Iris-setosa
## 37      5.5      3.5 Iris-setosa
## 38      4.9      3.1 Iris-setosa
## 39      4.4      3.0 Iris-setosa
## 40      5.1      3.4 Iris-setosa
## 41      5.0      3.5 Iris-setosa
## 42      4.5      2.3 Iris-setosa
## 43      4.4      3.2 Iris-setosa
## 44      5.0      3.5 Iris-setosa
## 45      5.1      3.8 Iris-setosa
## 46      4.8      3.0 Iris-setosa
## 47      5.1      3.8 Iris-setosa
## 48      4.6      3.2 Iris-setosa
## 49      5.3      3.7 Iris-setosa
## 50      5.0      3.3 Iris-setosa
```

```
# Create a data frame iris2 that orders the observations from largest to smallest sepal length. Show th
iris2=iris[order(iris$Sepal.Length), ]
iris2
```

##	Sepal.Length	Sepal.Width	Petal.Length	Petal.Width	Species
## 14	4.3	3.0	1.1	0.1	Iris-setosa
## 9	4.4	2.9	1.4	0.2	Iris-setosa
## 39	4.4	3.0	1.3	0.2	Iris-setosa
## 43	4.4	3.2	1.3	0.2	Iris-setosa
## 42	4.5	2.3	1.3	0.3	Iris-setosa
## 4	4.6	3.1	1.5	0.2	Iris-setosa
## 7	4.6	3.4	1.4	0.3	Iris-setosa
## 23	4.6	3.6	1.0	0.2	Iris-setosa
## 48	4.6	3.2	1.4	0.2	Iris-setosa
## 3	4.7	3.2	1.3	0.2	Iris-setosa
## 30	4.7	3.2	1.6	0.2	Iris-setosa
## 12	4.8	3.4	1.6	0.2	Iris-setosa
## 13	4.8	3.0	1.4	0.1	Iris-setosa
## 25	4.8	3.4	1.9	0.2	Iris-setosa
## 31	4.8	3.1	1.6	0.2	Iris-setosa
## 46	4.8	3.0	1.4	0.3	Iris-setosa
## 2	4.9	3.0	1.4	0.2	Iris-setosa
## 10	4.9	3.1	1.5	0.1	Iris-setosa
## 35	4.9	3.1	1.5	0.1	Iris-setosa
## 38	4.9	3.1	1.5	0.1	Iris-setosa
## 58	4.9	2.4	3.3	1.0	Iris-versicolor
## 107	4.9	2.5	4.5	1.7	Iris-virginica
## 5	5.0	3.6	1.4	0.2	Iris-setosa

## 8	5.0	3.4	1.5	0.2	Iris-setosa
## 26	5.0	3.0	1.6	0.2	Iris-setosa
## 27	5.0	3.4	1.6	0.4	Iris-setosa
## 36	5.0	3.2	1.2	0.2	Iris-setosa
## 41	5.0	3.5	1.3	0.3	Iris-setosa
## 44	5.0	3.5	1.6	0.6	Iris-setosa
## 50	5.0	3.3	1.4	0.2	Iris-setosa
## 61	5.0	2.0	3.5	1.0	Iris-versicolor
## 94	5.0	2.3	3.3	1.0	Iris-versicolor
## 1	5.1	3.5	1.4	0.2	Iris-setosa
## 18	5.1	3.5	1.4	0.3	Iris-setosa
## 20	5.1	3.8	1.5	0.3	Iris-setosa
## 22	5.1	3.7	1.5	0.4	Iris-setosa
## 24	5.1	3.3	1.7	0.5	Iris-setosa
## 40	5.1	3.4	1.5	0.2	Iris-setosa
## 45	5.1	3.8	1.9	0.4	Iris-setosa
## 47	5.1	3.8	1.6	0.2	Iris-setosa
## 99	5.1	2.5	3.0	1.1	Iris-versicolor
## 28	5.2	3.5	1.5	0.2	Iris-setosa
## 29	5.2	3.4	1.4	0.2	Iris-setosa
## 33	5.2	4.1	1.5	0.1	Iris-setosa
## 60	5.2	2.7	3.9	1.4	Iris-versicolor
## 49	5.3	3.7	1.5	0.2	Iris-setosa
## 6	5.4	3.9	1.7	0.4	Iris-setosa
## 11	5.4	3.7	1.5	0.2	Iris-setosa
## 17	5.4	3.9	1.3	0.4	Iris-setosa
## 21	5.4	3.4	1.7	0.2	Iris-setosa
## 32	5.4	3.4	1.5	0.4	Iris-setosa
## 85	5.4	3.0	4.5	1.5	Iris-versicolor
## 34	5.5	4.2	1.4	0.2	Iris-setosa
## 37	5.5	3.5	1.3	0.2	Iris-setosa
## 54	5.5	2.3	4.0	1.3	Iris-versicolor
## 81	5.5	2.4	3.8	1.1	Iris-versicolor
## 82	5.5	2.4	3.7	1.0	Iris-versicolor
## 90	5.5	2.5	4.0	1.3	Iris-versicolor
## 91	5.5	2.6	4.4	1.2	Iris-versicolor
## 65	5.6	2.9	3.6	1.3	Iris-versicolor
## 67	5.6	3.0	4.5	1.5	Iris-versicolor
## 70	5.6	2.5	3.9	1.1	Iris-versicolor
## 89	5.6	3.0	4.1	1.3	Iris-versicolor
## 95	5.6	2.7	4.2	1.3	Iris-versicolor
## 122	5.6	2.8	4.9	2.0	Iris-virginica
## 16	5.7	4.4	1.5	0.4	Iris-setosa
## 19	5.7	3.8	1.7	0.3	Iris-setosa
## 56	5.7	2.8	4.5	1.3	Iris-versicolor
## 80	5.7	2.6	3.5	1.0	Iris-versicolor
## 96	5.7	3.0	4.2	1.2	Iris-versicolor
## 97	5.7	2.9	4.2	1.3	Iris-versicolor
## 100	5.7	2.8	4.1	1.3	Iris-versicolor
## 114	5.7	2.5	5.0	2.0	Iris-virginica
## 15	5.8	4.0	1.2	0.2	Iris-setosa
## 68	5.8	2.7	4.1	1.0	Iris-versicolor
## 83	5.8	2.7	3.9	1.2	Iris-versicolor
## 93	5.8	2.6	4.0	1.2	Iris-versicolor

## 102	5.8	2.7	5.1	1.9	Iris-virginica
## 115	5.8	2.8	5.1	2.4	Iris-virginica
## 143	5.8	2.7	5.1	1.9	Iris-virginica
## 62	5.9	3.0	4.2	1.5	Iris-versicolor
## 71	5.9	3.2	4.8	1.8	Iris-versicolor
## 150	5.9	3.0	5.1	1.8	Iris-virginica
## 63	6.0	2.2	4.0	1.0	Iris-versicolor
## 79	6.0	2.9	4.5	1.5	Iris-versicolor
## 84	6.0	2.7	5.1	1.6	Iris-versicolor
## 86	6.0	3.4	4.5	1.6	Iris-versicolor
## 120	6.0	2.2	5.0	1.5	Iris-virginica
## 139	6.0	3.0	4.8	1.8	Iris-virginica
## 64	6.1	2.9	4.7	1.4	Iris-versicolor
## 72	6.1	2.8	4.0	1.3	Iris-versicolor
## 74	6.1	2.8	4.7	1.2	Iris-versicolor
## 92	6.1	3.0	4.6	1.4	Iris-versicolor
## 128	6.1	3.0	4.9	1.8	Iris-virginica
## 135	6.1	2.6	5.6	1.4	Iris-virginica
## 69	6.2	2.2	4.5	1.5	Iris-versicolor
## 98	6.2	2.9	4.3	1.3	Iris-versicolor
## 127	6.2	2.8	4.8	1.8	Iris-virginica
## 149	6.2	3.4	5.4	2.3	Iris-virginica
## 57	6.3	3.3	4.7	1.6	Iris-versicolor
## 73	6.3	2.5	4.9	1.5	Iris-versicolor
## 88	6.3	2.3	4.4	1.3	Iris-versicolor
## 101	6.3	3.3	6.0	2.5	Iris-virginica
## 104	6.3	2.9	5.6	1.8	Iris-virginica
## 124	6.3	2.7	4.9	1.8	Iris-virginica
## 134	6.3	2.8	5.1	1.5	Iris-virginica
## 137	6.3	3.4	5.6	2.4	Iris-virginica
## 147	6.3	2.5	5.0	1.9	Iris-virginica
## 52	6.4	3.2	4.5	1.5	Iris-versicolor
## 75	6.4	2.9	4.3	1.3	Iris-versicolor
## 112	6.4	2.7	5.3	1.9	Iris-virginica
## 116	6.4	3.2	5.3	2.3	Iris-virginica
## 129	6.4	2.8	5.6	2.1	Iris-virginica
## 133	6.4	2.8	5.6	2.2	Iris-virginica
## 138	6.4	3.1	5.5	1.8	Iris-virginica
## 55	6.5	2.8	4.6	1.5	Iris-versicolor
## 105	6.5	3.0	5.8	2.2	Iris-virginica
## 111	6.5	3.2	5.1	2.0	Iris-virginica
## 117	6.5	3.0	5.5	1.8	Iris-virginica
## 148	6.5	3.0	5.2	2.0	Iris-virginica
## 59	6.6	2.9	4.6	1.3	Iris-versicolor
## 76	6.6	3.0	4.4	1.4	Iris-versicolor
## 66	6.7	3.1	4.4	1.4	Iris-versicolor
## 78	6.7	3.0	5.0	1.7	Iris-versicolor
## 87	6.7	3.1	4.7	1.5	Iris-versicolor
## 109	6.7	2.5	5.8	1.8	Iris-virginica
## 125	6.7	3.3	5.7	2.1	Iris-virginica
## 141	6.7	3.1	5.6	2.4	Iris-virginica
## 145	6.7	3.3	5.7	2.5	Iris-virginica
## 146	6.7	3.0	5.2	2.3	Iris-virginica
## 77	6.8	2.8	4.8	1.4	Iris-versicolor

```
## 113      6.8      3.0      5.5      2.1 Iris-virginica
## 144      6.8      3.2      5.9      2.3 Iris-virginica
## 53       6.9      3.1      4.9      1.5 Iris-versicolor
## 121      6.9      3.2      5.7      2.3 Iris-virginica
## 140      6.9      3.1      5.4      2.1 Iris-virginica
## 142      6.9      3.1      5.1      2.3 Iris-virginica
## 51       7.0      3.2      4.7      1.4 Iris-versicolor
## 103      7.1      3.0      5.9      2.1 Iris-virginica
## 110      7.2      3.6      6.1      2.5 Iris-virginica
## 126      7.2      3.2      6.0      1.8 Iris-virginica
## 130      7.2      3.0      5.8      1.6 Iris-virginica
## 108      7.3      2.9      6.3      1.8 Iris-virginica
## 131      7.4      2.8      6.1      1.9 Iris-virginica
## 106      7.6      3.0      6.6      2.1 Iris-virginica
## 118      7.7      3.8      6.7      2.2 Iris-virginica
## 119      7.7      2.6      6.9      2.3 Iris-virginica
## 123      7.7      2.8      6.7      2.0 Iris-virginica
## 136      7.7      3.0      6.1      2.3 Iris-virginica
## 132      7.9      3.8      6.4      2.0 Iris-virginica
```

```
head(iris2, 6)
```

```
##      Sepal.Length Sepal.Width Petal.Length Petal.Width      Species
## 14          4.3          3.0          1.1          0.1 Iris-setosa
## 9           4.4          2.9          1.4          0.2 Iris-setosa
## 39          4.4          3.0          1.3          0.2 Iris-setosa
## 43          4.4          3.2          1.3          0.2 Iris-setosa
## 42          4.5          2.3          1.3          0.3 Iris-setosa
## 4           4.6          3.1          1.5          0.2 Iris-setosa
```

```
#Add a new column 'sepal area' by calculating sepal area =(length * width) for each observation.
```

```
#Calculate the average sepal length, the average sepal width for (i) entire data frame (ii) for each sp
```

```
#For each species, calculate the percentage of cases with sepal length > 5.5.
```