



**ACADGILD**

# SESSION 4: FOUNDATIONAL R PROGRAMMING-II

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Assignment 3

## PROBLEM STATEMENT

1. `states=rownames(USArrests)`

- Get states names with 'w'.
- Get states names with 'W'.

2. Prepare a histogram of the number of characters in each US state.

## SOLUTION :

1. **The R-script for the given problem is as follows:**

```
USArrests
```

```
States = rownames(USArrests)
```

```
States
```

```
# Get states names with 'w'.
```

```
States[grep("w", States)]
```

```
#Get states names with 'W'.
```

```
States[grep("W", States)]
```

- `grep( )` function searches for matches to argument pattern within each element of a character vector.
- To get the states names with 'w', `grep("w", States)` is used and to get states names with 'W', `grep("W", States)` is used.

## The output of the R-Script (from Console window) is given as follows:

```
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Source

Console Terminal x
F:/ACADGILD - Online Course/ACAD Working Directory/
> USArrests
      Murder  Assault  urbanPop  Rape
Alabama    13.2    236      58 21.2
Alaska     10.0    263      48 44.5
Arizona     8.1    294      80 31.0
Arkansas    8.8    190      50 19.5
California  9.0    276      91 40.6
Colorado    7.9    204      78 38.7
Connecticut 3.3    110      77 11.1
Delaware    5.9    238      72 15.8
Florida    15.4    335      80 31.9
Georgia    17.4    211      60 25.8
Hawaii      5.3     46      83 20.2
Idaho       2.6    120      54 14.2
Illinois    10.4    249      83 24.0
Indiana     7.2    113      65 21.0
Iowa        2.2     56      57 11.3
Kansas      6.0    115      66 18.0
Kentucky    9.7    109      52 16.3
Louisiana   15.4    249      66 22.2
Maine       2.1     83      51  7.8
Maryland    11.3    300      67 27.8
Massachusetts 4.4    149      85 16.3
Michigan    12.1    255      74 35.1
Minnesota   2.7     72      66 14.9
Mississippi 16.1    259      44 17.1
Missouri    9.0    178      70 28.2
Montana     6.0    109      53 16.4
Nebraska    4.3    102      62 16.5
Nevada      12.2    252      81 46.0
New Hampshire 2.1     57      56  9.5
New Jersey  7.4    159      89 18.8
New Mexico  11.4    285      70 32.1
New York    11.1    254      86 26.1
North Carolina 13.0    337      45 16.1
North Dakota 0.8     45      44  7.3
Ohio        7.3    120      75 21.4
Oklahoma    6.6    151      68 20.0
```

```
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Go to file/function Addins

Source

Console Terminal x
F:/ACADGILD - Online Course/ACAD Working Directory/
New Hampshire 2.1     57      56  9.5
New Jersey    7.4    159      89 18.8
New Mexico    11.4    285      70 32.1
New York      11.1    254      86 26.1
North Carolina 13.0    337      45 16.1
North Dakota  0.8     45      44  7.3
Ohio          7.3    120      75 21.4
Oklahoma      6.6    151      68 20.0
Oregon        4.9    159      67 29.3
Pennsylvania  6.3    106      72 14.9
Rhode Island  3.4    174      87  8.3
South Carolina 14.4    279      48 22.5
South Dakota  3.8     86      45 12.8
Tennessee     13.2    188      59 26.9
Texas         12.7    201      80 25.5
Utah          3.2    120      80 22.9
Vermont       2.2     48      32 11.2
Virginia      8.5    156      63 20.7
Washington    4.0    145      73 26.2
West Virginia 5.7     81      39  9.3
Wisconsin     2.6     53      66 10.8
Wyoming       6.8    161      60 15.6
> States = rownames(USArrests)
> States
[1] "Alabama"      "Alaska"      "Arizona"      "Arkansas"      "California"    "Colorado"      "Connecticut"
[8] "Delaware"     "Florida"     "Georgia"     "Hawaii"      "Idaho"        "Illinois"     "Indiana"
[15] "Iowa"         "Kansas"     "Kentucky"    "Louisiana"    "Maine"        "Maryland"     "Massachusetts"
[22] "Michigan"     "Minnesota"   "Mississippi" "Missouri"     "Montana"      "Nebraska"     "Nevada"
[29] "New Hampshire" "New Jersey"  "New Mexico"  "New York"     "North Carolina" "North Dakota" "Ohio"
[36] "Oklahoma"     "Oregon"      "Pennsylvania" "Rhode Island" "South Carolina" "South Dakota" "Tennessee"
[43] "Texas"        "Utah"        "Vermont"     "Virginia"     "Washington"    "West Virginia" "Wisconsin"
[50] "Wyoming"
> States[grep("w", States)]
[1] "Delaware"      "Hawaii"      "Iowa"         "New Hampshire" "New Jersey"    "New Mexico"    "New York"
> States[grep("w", States)]
[1] "Washington"    "West Virginia" "Wisconsin"    "Wyoming"
>
```

## 2. The R-script for the given problem is as follows:

```
df <- nchar(States)
df
hist(df)
```

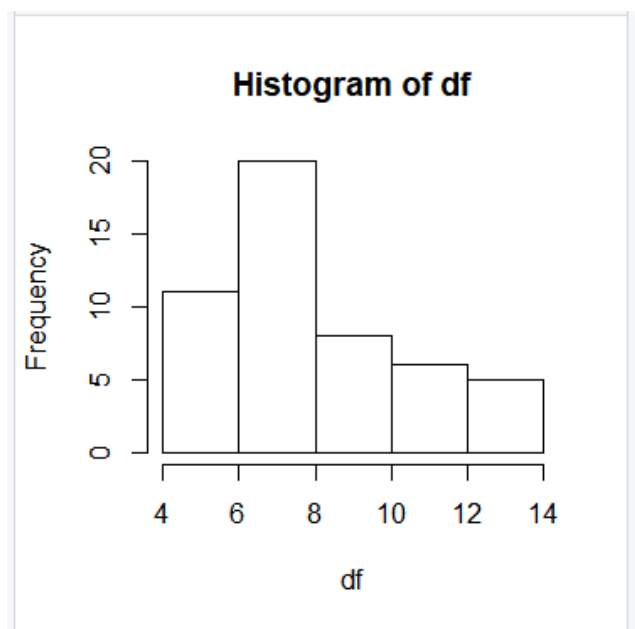
#OR

```
hist(nchar(States))
```

- `nchar( )` takes a character vector as an argument and returns a vector whose elements contain the sizes of the corresponding elements
- `hist( )` computes a histogram of the given data values
- Here, `nchar(States)` will take `States` as an argument and returns a vector whose elements contain the sizes of `State`.
- `hist(nchar(States))` plots a histogram of the number of characters in `State`

**The output of the R-Script is given as follows:**

```
> df <- nchar(States)
> df
[1] 7 6 7 8 10 8 11 8 7 7 6 5 8 7 4 6 8 9 5 8 13 8 9 11 8 7 8 6 1
12 14
[41] 12 9 5 4 7 8 10 13 9 7
> hist(df)
```



```
> hist(nchar(States))
```

