

## Tugas Modul 3

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### R Markdown

#### 1. Gunakan fungsi str untuk memeriksa struktur objek “murders”.

```
library(dslabs)
data(murders)
str(murders)

## 'data.frame':   51 obs. of  5 variables:
## $ state      : chr  "Alabama" "Alaska" "Arizona" "Arkansas" ...
## $ abb        : chr  "AL" "AK" "AZ" "AR" ...
## $ region     : Factor w/ 4 levels "Northeast","South",...: 2 4 4 2 4
## $ population: num  4779736 710231 6392017 2915918 37253956 ...
## $ total      : num  135 19 232 93 1257 ...
```

**Manakah dari pernyataan berikut ini yang paling menggambarkan karakter dari tiap variabel pada data frame?**

- a. Terdiri dari 51 negara.

```
length(murders$state)
```

```
## [1] 51
```

- b. Data berisi tingkat pembunuhan pada 50 negara bagian dan DC
- ```
murders$state
```

```
## [1] "Alabama"      "Alaska"      "Arizona"
## [4] "Arkansas"     "California"   "Colorado"
## [7] "Connecticut"  "Delaware"     "District of Colu
mbia"
## [10] "Florida"      "Georgia"      "Hawaii"
## [13] "Idaho"        "Illinois"     "Indiana"
## [16] "Iowa"         "Kansas"       "Kentucky"
## [19] "Louisiana"    "Maine"        "Maryland"
```

|                          |                  |                 |
|--------------------------|------------------|-----------------|
| ## [22] "Massachusetts"  | "Michigan"       | "Minnesota"     |
| ## [25] "Mississippi"    | "Missouri"       | "Montana"       |
| ## [28] "Nebraska"       | "Nevada"         | "New Hampshire" |
| ## [31] "New Jersey"     | "New Mexico"     | "New York"      |
| ## [34] "North Carolina" | "North Dakota"   | "Ohio"          |
| ## [37] "Oklahoma"       | "Oregon"         | "Pennsylvania"  |
| ## [40] "Rhode Island"   | "South Carolina" | "South Dakota"  |
| ## [43] "Tennessee"      | "Texas"          | "Utah"          |
| ## [46] "Vermont"        | "Virginia"       | "Washington"    |
| ## [49] "West Virginia"  | "Wisconsin"      | "Wyoming"       |

c. Data berisi Nama negara bagian, singkatan dari nama negara bagian, wilayah negara bagian, dan populasi negara bagian serta jumlah total pembunuhan pada tahun 2010.

murders

| ##    | state                | abb | region        | population | total |
|-------|----------------------|-----|---------------|------------|-------|
| ## 1  | Alabama              | AL  | South         | 4779736    | 135   |
| ## 2  | Alaska               | AK  | West          | 710231     | 19    |
| ## 3  | Arizona              | AZ  | West          | 6392017    | 232   |
| ## 4  | Arkansas             | AR  | South         | 2915918    | 93    |
| ## 5  | California           | CA  | West          | 37253956   | 1257  |
| ## 6  | Colorado             | CO  | West          | 5029196    | 65    |
| ## 7  | Connecticut          | CT  | Northeast     | 3574097    | 97    |
| ## 8  | Delaware             | DE  | South         | 897934     | 38    |
| ## 9  | District of Columbia | DC  | South         | 601723     | 99    |
| ## 10 | Florida              | FL  | South         | 19687653   | 669   |
| ## 11 | Georgia              | GA  | South         | 9920000    | 376   |
| ## 12 | Hawaii               | HI  | West          | 1360301    | 7     |
| ## 13 | Idaho                | ID  | West          | 1567582    | 12    |
| ## 14 | Illinois             | IL  | North Central | 12830632   | 364   |
| ## 15 | Indiana              | IN  | North Central | 6483802    | 142   |
| ## 16 | Iowa                 | IA  | North Central | 3046355    | 21    |
| ## 17 | Kansas               | KS  | North Central | 2853118    | 63    |
| ## 18 | Kentucky             | KY  | South         | 4339367    | 116   |
| ## 19 | Louisiana            | LA  | South         | 4533372    | 351   |
| ## 20 | Maine                | ME  | Northeast     | 1328361    | 11    |
| ## 21 | Maryland             | MD  | South         | 5773552    | 293   |
| ## 22 | Massachusetts        | MA  | Northeast     | 6547629    | 118   |

|       |                |    |               |          |     |
|-------|----------------|----|---------------|----------|-----|
| ## 23 | Michigan       | MI | North Central | 9883640  | 413 |
| ## 24 | Minnesota      | MN | North Central | 5303925  | 53  |
| ## 25 | Mississippi    | MS | South         | 2967297  | 120 |
| ## 26 | Missouri       | MO | North Central | 5988927  | 321 |
| ## 27 | Montana        | MT | West          | 989415   | 12  |
| ## 28 | Nebraska       | NE | North Central | 1826341  | 32  |
| ## 29 | Nevada         | NV | West          | 2700551  | 84  |
| ## 30 | New Hampshire  | NH | Northeast     | 1316470  | 5   |
| ## 31 | New Jersey     | NJ | Northeast     | 8791894  | 246 |
| ## 32 | New Mexico     | NM | West          | 2059179  | 67  |
| ## 33 | New York       | NY | Northeast     | 19378102 | 517 |
| ## 34 | North Carolina | NC | South         | 9535483  | 286 |
| ## 35 | North Dakota   | ND | North Central | 672591   | 4   |
| ## 36 | Ohio           | OH | North Central | 11536504 | 310 |
| ## 37 | Oklahoma       | OK | South         | 3751351  | 111 |
| ## 38 | Oregon         | OR | West          | 3831074  | 36  |
| ## 39 | Pennsylvania   | PA | Northeast     | 12702379 | 457 |
| ## 40 | Rhode Island   | RI | Northeast     | 1052567  | 16  |
| ## 41 | South Carolina | SC | South         | 4625364  | 207 |
| ## 42 | South Dakota   | SD | North Central | 814180   | 8   |
| ## 43 | Tennessee      | TN | South         | 6346105  | 219 |
| ## 44 | Texas          | TX | South         | 25145561 | 805 |
| ## 45 | Utah           | UT | West          | 2763885  | 22  |
| ## 46 | Vermont        | VT | Northeast     | 625741   | 2   |
| ## 47 | Virginia       | VA | South         | 8001024  | 250 |
| ## 48 | Washington     | WA | West          | 6724540  | 93  |
| ## 49 | West Virginia  | WV | South         | 1852994  | 27  |
| ## 50 | Wisconsin      | WI | North Central | 5686986  | 97  |
| ## 51 | Wyoming        | WY | West          | 563626   | 5   |

## 2. Sebutkan apa saja nama kolom yang digunakan pada data frame

```
names(murders)
```

```
## [1] "state"      "abb"        "region"     "population" "total"
```

## 3. Gunakan operator akses (\$) untuk mengekstrak informasi singkatan negara dan menyimpannya pada objek "a". Sebutkan jenis class dari objek tersebut.

```
a = murders$abb
class(a)
```

```
## [1] "character"
```

## 4. Gunakan tanda kurung siku untuk mengekstrak singkatan negara dan menyimpannya pada objek "b". Tentukan apakah variabel "a" dan "b" bernilai sama?

```
b=murders[[2]]
a
```

```
## [1] "AL" "AK" "AZ" "AR" "CA" "CO" "CT" "DE" "DC" "FL" "GA" "HI" "ID"
" "IL" "IN"
## [16] "IA" "KS" "KY" "LA" "ME" "MD" "MA" "MI" "MN" "MS" "MO" "MT" "NE"
" "NV" "NH"
## [31] "NJ" "NM" "NY" "NC" "ND" "OH" "OK" "OR" "PA" "RI" "SC" "SD" "TN"
" "TX" "UT"
## [46] "VT" "VA" "WA" "WV" "WI" "WY"
```

b

```
## [1] "AL" "AK" "AZ" "AR" "CA" "CO" "CT" "DE" "DC" "FL" "GA" "HI" "ID"
" "IL" "IN"
## [16] "IA" "KS" "KY" "LA" "ME" "MD" "MA" "MI" "MN" "MS" "MO" "MT" "NE"
" "NV" "NH"
## [31] "NJ" "NM" "NY" "NC" "ND" "OH" "OK" "OR" "PA" "RI" "SC" "SD" "TN"
" "TX" "UT"
## [46] "VT" "VA" "WA" "WV" "WI" "WY"
```

Bernilai sama

**5. Variabel region memiliki tipe data: factor. Dengan satu baris kode, gunakan fungsi level dan length untuk menentukan jumlah region yang dimiliki dataset.**

```
length(levels(murders$region))
```

```
## [1] 4
```

**6. Fungsi table dapat digunakan untuk ekstraksi data pada tipe vektor dan menampilkan frekuensi dari setiap elemen. Dengan menerapkan fungsi tersebut, dapat diketahui jumlah state pada tiap region. Gunakan fungsi table dalam satu baris kode untuk menampilkan tabel baru yang berisi jumlah state pada tiap region.**

```
table(murders$region)
```

```
##
##      Northeast      South North Central      West
##           9          17          12          13
```