Latihan

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```
library(dslabs)
data("murders")

pop = murders$population
sort = sort(pop)
sort[1]
```

```
## [1] 563626
```

```
order = order(pop)
order[1]
```

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

```
min = which.min(pop)
min
```

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

```
order = order(pop)
murders$state[order[1]]
```

```
## [1] "Wyoming"
```

```
ranks = rank(pop)
my_df <- data.frame(name = murders$state, rank = ranks)
my_df
```

```
##                   name rank
## 1              Alabama   29
## 2               Alaska    5
## 3              Arizona   36
## 4             Arkansas   20
## 5           California   51
## 6             Colorado   30
## 7          Connecticut   23
## 8             Delaware    7
## 9  District of Columbia    2
```

```
## 10              Florida   49
## 11              Georgia   44
## 12               Hawaii   12
## 13                Idaho   13
## 14             Illinois   47
## 15              Indiana   37
## 16                 Iowa   22
## 17               Kansas   19
## 18             Kentucky   26
## 19            Louisiana   27
## 20                Maine   11
## 21             Maryland   33
## 22        Massachusetts   38
## 23             Michigan   43
## 24            Minnesota   31
## 25          Mississippi   21
## 26             Missouri   34
## 27              Montana    8
## 28             Nebraska   14
## 29               Nevada   17
## 30        New Hampshire   10
## 31           New Jersey   41
## 32           New Mexico   16
## 33             New York   48
## 34       North Carolina   42
## 35         North Dakota    4
## 36                 Ohio   45
## 37             Oklahoma   24
## 38               Oregon   25
## 39         Pennsylvania   46
## 40         Rhode Island    9
## 41       South Carolina   28
## 42         South Dakota    6
## 43            Tennessee   35
## 44                Texas   50
## 45                 Utah   18
## 46              Vermont    3
## 47             Virginia   40
## 48           Washington   39
## 49        West Virginia   15
## 50            Wisconsin   32
## 51              Wyoming    1
```

```
ind = order(pop, decreasing = TRUE)
names = murders$state[ind]
names
```

```
##  [1] "California"          "Texas"               "Florida"
##  [4] "New York"            "Illinois"            "Pennsylvania"
##  [7] "Ohio"                "Georgia"             "Michigan"
## [10] "North Carolina"      "New Jersey"          "Virginia"
## [13] "Washington"          "Massachusetts"       "Indiana"
## [16] "Arizona"             "Tennessee"           "Missouri"
## [19] "Maryland"            "Wisconsin"           "Minnesota"
```

```
## [22] "Colorado"             "Alabama"              "South Carolina"
## [25] "Louisiana"            "Kentucky"             "Oregon"
## [28] "Oklahoma"             "Connecticut"          "Iowa"
## [31] "Mississippi"          "Arkansas"             "Kansas"
## [34] "Utah"                 "Nevada"               "New Mexico"
## [37] "West Virginia"        "Nebraska"             "Idaho"
## [40] "Hawaii"               "Maine"                "New Hampshire"
## [43] "Rhode Island"         "Montana"              "Delaware"
## [46] "South Dakota"         "Alaska"               "North Dakota"
## [49] "Vermont"              "District of Columbia" "Wyoming"
```

```
my_df <- data.frame(name = names, rank = 1:51)
my_df
```

```
##                   name rank
## 1           California    1
## 2                Texas    2
## 3              Florida    3
## 4             New York    4
## 5             Illinois    5
## 6         Pennsylvania    6
## 7                 Ohio    7
## 8              Georgia    8
## 9             Michigan    9
## 10      North Carolina   10
## 11          New Jersey   11
## 12            Virginia   12
## 13          Washington   13
## 14       Massachusetts   14
## 15             Indiana   15
## 16             Arizona   16
## 17           Tennessee   17
## 18            Missouri   18
## 19            Maryland   19
## 20           Wisconsin   20
## 21           Minnesota   21
## 22            Colorado   22
## 23             Alabama   23
## 24      South Carolina   24
## 25           Louisiana   25
## 26            Kentucky   26
## 27              Oregon   27
## 28            Oklahoma   28
## 29         Connecticut   29
## 30                Iowa   30
## 31         Mississippi   31
## 32            Arkansas   32
## 33              Kansas   33
## 34                Utah   34
## 35              Nevada   35
## 36          New Mexico   36
## 37       West Virginia   37
## 38            Nebraska   38
## 39               Idaho   39
```

```
## 40               Hawaii   40
## 41                Maine   41
## 42        New Hampshire   42
## 43         Rhode Island   43
## 44              Montana   44
## 45             Delaware   45
## 46         South Dakota   46
## 47               Alaska   47
## 48         North Dakota   48
## 49              Vermont   49
## 50 District of Columbia   50
## 51              Wyoming   51
```

```
ind = order(pop, decreasing = TRUE)
names = murders$state[ind]
names
```

```
##  [1] "California"           "Texas"                "Florida"
##  [4] "New York"             "Illinois"             "Pennsylvania"
##  [7] "Ohio"                 "Georgia"              "Michigan"
## [10] "North Carolina"       "New Jersey"           "Virginia"
## [13] "Washington"           "Massachusetts"        "Indiana"
## [16] "Arizona"              "Tennessee"            "Missouri"
## [19] "Maryland"             "Wisconsin"            "Minnesota"
## [22] "Colorado"             "Alabama"              "South Carolina"
## [25] "Louisiana"            "Kentucky"             "Oregon"
## [28] "Oklahoma"             "Connecticut"          "Iowa"
## [31] "Mississippi"          "Arkansas"             "Kansas"
## [34] "Utah"                 "Nevada"               "New Mexico"
## [37] "West Virginia"        "Nebraska"             "Idaho"
## [40] "Hawaii"               "Maine"                "New Hampshire"
## [43] "Rhode Island"         "Montana"              "Delaware"
## [46] "South Dakota"         "Alaska"               "North Dakota"
## [49] "Vermont"              "District of Columbia" "Wyoming"
```

```
my_df <- data.frame(name = names, rank = 1:51)
my_df
```

```
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## 1           California    1
## 2                Texas    2
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```

```
## 15              Indiana   15
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## 17            Tennessee   17
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## 37        West Virginia   37
## 38             Nebraska   38
## 39                Idaho   39
## 40               Hawaii   40
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## 43         Rhode Island   43
## 44              Montana   44
## 45             Delaware   45
## 46         South Dakota   46
## 47               Alaska   47
## 48         North Dakota   48
## 49              Vermont   49
## 50 District of Columbia   50
## 51              Wyoming   51
```
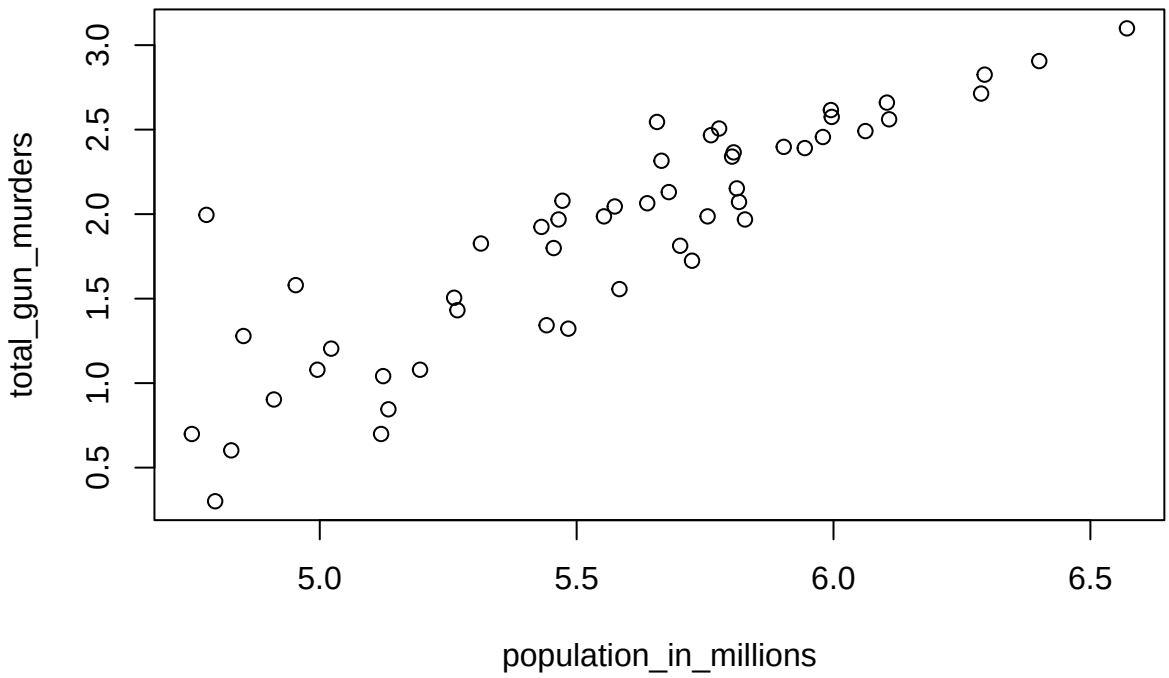

```
population_in_millions <- log10(murders$population/10)
total_gun_murders <- log10(murders$total)
plot(population_in_millions, total_gun_murders)
```


total_gun_murders
0.5
1.0
1.5
2.0
2.5
3.0
5.0
5.5
6.0
6.5
population_in_millions