television-dataset

ilke

2022-08-06

```r
library(mice)
library(tidyverse)
library(psych)
library(funModeling)
library(d3Tree)
library(d3Tree)
library(magrittr)
library(DataExplorer)
library(maps)
library(plotly)
library(DT)
library(tidytext)
library(gridExtra)
library(dplyr)
library(factoextra)
library(randomForest)
library(corrplot)
library(plyr)
library(scales)
library(readr)
library(ggthemes)
library(ggplot2)
library(tidyverse)
library(lubridate)
library(funModeling)
library(Hmisc)
library(pls)
library(elasticnet)
library(broom)
library(glmnet)
library(MASS)
library(ISLR)
library(PerformanceAnalytics)
library(funModeling)
library(Matrix)
library(readxl)
library(tidyverse)
library(funModeling)
library(magrittr)
library(DataExplorer)
library(maps)
library(plotly)
library(DT)
library(tidytext)
library(gridExtra)
library(dplyr)
library(naniar)
library(factoextra)
library(randomForest)
library(corrplot)
library(plyr)
library(scales)
library(readr)
library(ggthemes)
library(ggplot2)
library(tidyverse)
library(tidyselect)
```

1.veri aktarımı

```r
getwd()
```

```
## [1] "/home/ilke/Downloads"
```

```r
setwd("/home/ilke/Downloads")

df<- read.csv("TELEVISION.csv",sep=",",header=TRUE,stringsAsFactors = FALSE)
```

2.veriye ilk bakış

```
colnames(df)
```

```
## [1] "Product_Name"   "Stars"        "Ratings"       "Reviews"
## [5] "current_price"  "MRP"          "channel"       "Operating_system"
## [9] "Picture_qualtiy" "Speaker"      "Frequency"     "Image_url"
```

```
rownames(df)
```

```
## [1] "Product_Name"   "Stars"        "Ratings"       "Reviews"
## [5] "current_price"  "MRP"          "channel"       "Operating_system"
## [9] "Picture_qualtiy" "Speaker"      "Frequency"     "Image_url"
```

```
##   [1] "1"   "2"   "3"   "4"   "5"   "6"   "7"   "8"   "9"   "10"  "11"  "12"
##  [13] "13"  "14"  "15"  "16"  "17"  "18"  "19"  "20"  "21"  "22"  "23"  "24"
##  [25] "25"  "26"  "27"  "28"  "29"  "30"  "31"  "32"  "33"  "34"  "35"  "36"
##  [37] "37"  "38"  "39"  "40"  "41"  "42"  "43"  "44"  "45"  "46"  "47"  "48"
##  [49] "49"  "50"  "51"  "52"  "53"  "54"  "55"  "56"  "57"  "58"  "59"  "60"
##  [61] "61"  "62"  "63"  "64"  "65"  "66"  "67"  "68"  "69"  "70"  "71"  "72"
##  [73] "73"  "74"  "75"  "76"  "77"  "78"  "79"  "80"  "81"  "82"  "83"  "84"
##  [85] "85"  "86"  "87"  "88"  "89"  "90"  "91"  "92"  "93"  "94"  "95"  "96"
##  [97] "97"  "98"  "99"  "100" "101" "102" "103" "104" "105" "106" "107" "108"
## [109] "109" "110" "111" "112" "113" "114" "115" "116" "117" "118" "119" "120"
## [121] "121" "122" "123" "124" "125" "126" "127" "128" "129" "130" "131" "132"
## [133] "133" "134" "135" "136" "137" "138" "139" "140" "141" "142" "143" "144"
## [145] "145" "146" "147" "148" "149" "150" "151" "152" "153" "154" "155" "156"
## [157] "157" "158" "159" "160" "161" "162" "163" "164" "165" "166" "167" "168"
## [169] "169" "170" "171" "172" "173" "174" "175" "176" "177" "178" "179" "180"
## [181] "181" "182" "183" "184" "185" "186" "187" "188" "189" "190" "191" "192"
## [193] "193" "194" "195" "196" "197" "198" "199" "200" "201" "202" "203" "204"
## [205] "205" "206" "207" "208" "209" "210" "211" "212" "213" "214" "215" "216"
## [217] "217" "218" "219" "220" "221" "222" "223" "224" "225" "226" "227" "228"
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## [253] "253" "254" "255" "256" "257" "258" "259" "260" "261" "262" "263" "264"
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## [289] "289" "290" "291" "292" "293" "294" "295" "296" "297" "298" "299" "300"
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## [313] "313" "314" "315" "316" "317" "318" "319" "320" "321" "322" "323" "324"
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## [457] "457" "458" "459" "460" "461" "462" "463" "464" "465" "466" "467" "468"
## [469] "469" "470" "471" "472" "473" "474" "475" "476" "477" "478" "479" "480"
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## [493] "493" "494" "495" "496" "497" "498" "499" "500" "501" "502" "503" "504"
## [505] "505" "506" "507" "508" "509" "510" "511" "512" "513" "514" "515" "516"
## [517] "517" "518" "519" "520" "521" "522" "523" "524" "525" "526" "527" "528"
## [529] "529" "530" "531" "532" "533" "534" "535" "536" "537" "538" "539" "540"
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## [565] "565" "566" "567" "568" "569" "570" "571" "572" "573" "574" "575" "576"
## [577] "577" "578" "579" "580" "581" "582" "583" "584" "585" "586" "587" "588"
## [589] "589" "590" "591" "592" "593" "594" "595" "596" "597" "598" "599" "600"
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## [721] "721" "722" "723" "724" "725" "726" "727" "728" "729" "730" "731" "732"
## [733] "733" "734" "735" "736" "737" "738" "739" "740" "741" "742" "743" "744"
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## [769] "769" "770" "771" "772" "773" "774" "775" "776" "777" "778" "779" "780"
## [781] "781" "782" "783" "784" "785" "786" "787" "788" "789" "790" "791" "792"
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## [829] "829" "830" "831" "832" "833" "834" "835" "836" "837" "838" "839" "840"
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## [865] "865" "866" "867" "868" "869" "870" "871" "872" "873" "874" "875" "876"
## [877] "877" "878" "879" "880" "881" "882" "883" "884" "885" "886" "887" "888"
```

```r
nrow(df)
```

```
## [1] 888
```

```
ncol(df)
```

```
## [1] 12
```

```
head(df)
```

```
##   Product_Name Stars Ratings Reviews current_price    MRP
## 1        Croma   4.2    1773     217        ₹7990 ₹20000
## 2        Adsun   3.8    6742     930        ₹8699 ₹21999
## 3           LG   4.4   38870    3443       ₹16499 ₹21990
## 4      OnePlus   4.3  101256    9189       ₹16499 ₹21999
## 5       Xiaomi   4.3    3120     305       ₹15499 ₹24999
## 6      SAMSUNG   4.4   53639    4811       ₹15999 ₹22900
##                                    channel           Operating_system
## 1                HD Ready 1366 x 768 Pixels            20 Speaker Output
## 2          Netflix|Disney+Hotstar|Youtube Operating System: Android Based
## 3 Netflix|Prime Video|Disney+Hotstar|Youtube       Operating System: WebOS
## 4 Netflix|Prime Video|Disney+Hotstar|Youtube     Operating System: Android
## 5 Netflix|Prime Video|Disney+Hotstar|Youtube     Operating System: Android
## 6          Netflix|Disney+Hotstar|Youtube       Operating System: Tizen
##          Picture_qualtiy          Speaker         Frequency
## 1      60 Hz Refresh Rate  2 x HDMI | 2 x USB    1 Year Warranty
## 2 HD Ready 1366 x 768 Pixels 20 W Speaker Output 60 Hz Refresh Rate
## 3 HD Ready 1366 x 768 Pixels 10 W Speaker Output 50 Hz Refresh Rate
## 4 HD Ready 1366 x 768 Pixels 20 W Speaker Output 60 Hz Refresh Rate
## 5 HD Ready 1366 x 768 Pixels 20 W Speaker Output 60 Hz Refresh Rate
## 6 HD Ready 1366 x 768 Pixels 20 W Speaker Output 60 Hz Refresh Rate
##                                                                  Image_url
## 1       https://rukminim1.flixcart.com/image/312/312/ku1k4280/television/p/f/6/crel7369-croma-original-imag7969pxhrwp2k.jpeg?q=70
## 2       https://rukminim1.flixcart.com/image/312/312/krntoy80/television/u/d/y/a-3200s-adsun-original-imag5edguuyn54fh.jpeg?q=70
## 3             https://rukminim1.flixcart.com/image/312/312/l0fm07k0/television/7/x/9/-original-imagc8fnpx39evgc.jpeg?q=70
## 4 https://rukminim1.flixcart.com/image/312/312/kzfvzww0/television/e/b/b/32hd2a00-32-y1s-oneplus-original-imagbgcewfqywgk7.jpeg?q=70
## 5       https://rukminim1.flixcart.com/image/312/312/l2ghgnk0/television/u/a/c/l32m7-5ain-mi-original-imagdsdwqf6bkmkz.jpeg?q=70
## 6  https://rukminim1.flixcart.com/image/312/312/kbs9k7k0/television/c/j/3/samsung-ua32t4340akxxl-original-imaft25qdysfsq7k.jpeg?q=70
```

```
str(df)
```

```
## 'data.frame':    888 obs. of  12 variables:
##  $ Product_Name    : chr  "Croma" "Adsun" "LG" "OnePlus" ...
##  $ Stars           : chr  "4.2" "3.8" "4.4" "4.3" ...
##  $ Ratings         : int  1773 6742 38870 101256 3120 53639 101256 0 5830 101256 ...
##  $ Reviews         : int  217 930 3443 9189 305 4811 9189 0 698 9189 ...
##  $ current_price   : chr  "₹7990" "₹8699" "₹16499" "₹16499" ...
##  $ MRP             : chr  "₹20000" "₹21999" "₹21990" "₹21999" ...
##  $ channel         : chr  "HD Ready 1366 x 768 Pixels" "Netflix|Disney+Hotstar|Youtube" "Netflix|Prime Video|Disney+Hotstar|Youtube" "Netflix|Prime Video|Disney+Hotstar|Youtube" ...
##  $ Operating_system: chr  "20 Speaker Output" "Operating System: Android Based" "Operating System: WebOS" "Operating System: Android" ...
##  $ Picture_qualtiy : chr  "60 Hz Refresh Rate" "HD Ready 1366 x 768 Pixels" "HD Ready 1366 x 768 Pixels" "HD Ready 1366 x 768 Pixels" ...
##  $ Speaker         : chr  "2 x HDMI | 2 x USB" "20 W Speaker Output" "10 W Speaker Output" "20 W Speaker Output" ...
##  $ Frequency       : chr  "1 Year Warranty" "60 Hz Refresh Rate" "50 Hz Refresh Rate" "60 Hz Refresh Rate" ...
##  $ Image_url       : chr  "https://rukminim1.flixcart.com/image/312/312/ku1k4280/television/p/f/6/crel7369-croma-original-imag7969pxhrwp2k.jpeg?q=70" "https://rukminim1.flixcart.com/image/312/312/krntoy80/television/u/d/y/a-3200s-adsun-original-imag5edguuyn54fh.jpeg?q=70" "https://rukminim1.flixcart.com/image/312/312/l0fm07k0/television/7/x/9/-original-imagc8fnpx39evgc.jpeg?q=70" "https://rukminim1.flixcart.com/image/312/312/kzfvzww0/television/e/b/b/32hd2a00-32-y1s-oneplus-original-imagbgc"| __truncated__ ...
```

```
glimpse(df) #veri seti genel yapı hakkında bilgi
```

```
## Rows: 888
## Columns: 12
## $ Product_Name    <chr> "Croma", "Adsun", "LG", "OnePlus", "Xiaomi", "SAMSUNG…
## $ Stars           <chr> "4.2", "3.8", "4.4", "4.3", "4.3", "4.4", "4.3", "4.2…
## $ Ratings         <int> 1773, 6742, 38870, 101256, 3120, 53639, 101256, 0, 58…
## $ Reviews         <int> 217, 930, 3443, 9189, 305, 4811, 9189, 0, 698, 9189, …
## $ current_price   <chr> "₹7990", "₹8699", "₹16499", "₹16499", "₹15499", "₹159…
## $ MRP             <chr> "₹20000", "₹21999", "₹21990", "₹21999", "₹24999", "₹2…
## $ channel         <chr> "HD Ready 1366 x 768 Pixels", "Netflix|Disney+Hotstar…
## $ Operating_system <chr> "20 Speaker Output", "Operating System: Android Based…
## $ Picture_qualtiy <chr> "60 Hz Refresh Rate", "HD Ready 1366 x 768 Pixels", "…
## $ Speaker         <chr> "2 x HDMI | 2 x USB", "20 W Speaker Output", "10 W Sp…
## $ Frequency       <chr> "1 Year Warranty", "60 Hz Refresh Rate", "50 Hz Refre…
## $ Image_url       <chr> "https://rukminim1.flixcart.com/image/312/312/ku1k428…
```

psych::headTail(df) *#ilk 4 son 4 gözlem*

```
##     Product_Name Stars Ratings Reviews current_price    MRP
## 1          Croma   4.2    1773     217         ₹7990 ₹20000
## 2          Adsun   3.8    6742     930         ₹8699 ₹21999
## 3             LG   4.4   38870    3443        ₹16499 ₹21990
## 4        OnePlus   4.3  101256    9189        ₹16499 ₹21999
## ...         <NA>  <NA>     ...     ...          <NA>   <NA>
## 885        Croma     0       0       0         ₹9194 ₹20000
## 886     T-Series     0       0       0        ₹26999 ₹33990
## 887        Adsun   3.8    6742     930         ₹6199 ₹12999
## 888         SONY   4.4       0       0        ₹52949 ₹72990
##                                           channel
## 1                        HD Ready 1366 x 768 Pixels
## 2                        Netflix|Disney+Hotstar|Youtube
## 3              Netflix|Prime Video|Disney+Hotstar|Youtube
## 4              Netflix|Prime Video|Disney+Hotstar|Youtube
## ...                                          <NA>
## 885                      HD Ready 1366 x 786 Pixels
## 886 Netflix|Prime Video|Apple TV|Disney+Hotstar|Youtube
## 887                      HD Ready 1366 x 768 Pixels
## 888           Ultra HD (4K) 3840 x 2160 pixels Pixels
##                 Operating_system         Picture_qualtiy
## 1                 20 Speaker Output      60 Hz Refresh Rate
## 2   Operating System: Android Based HD Ready 1366 x 768 Pixels
## 3         Operating System: WebOS HD Ready 1366 x 768 Pixels
## 4       Operating System: Android HD Ready 1366 x 768 Pixels
## ...                 <NA>                   <NA>
## 885             20 Speaker Output       60 Hz Refresh Rate
## 886     Full HD 1920 x 1080 Pixels         16 Speaker Output
## 887             20 W Speaker Output     60 Hz Refresh Rate
## 888           10W + 10W Speaker Output       50 Hz Refresh Rate
##              Speaker        Frequency
## 1     2 x HDMI | 2 x USB   1 Year Warranty
## 2   20 W Speaker Output 60 Hz Refresh Rate
## 3   10 W Speaker Output 50 Hz Refresh Rate
## 4   20 W Speaker Output 60 Hz Refresh Rate
## ...           <NA>             <NA>
## 885 2 x HDMI | 2 x USB   3 Years Warranty
## 886 50 Hz Refresh Rate 2 x HDMI | 2 x USB
## 887 1 x HDMI | 2 x USB       A+ Grade
## 888 2 x HDMI | 2 x USB          1 YEAR
##                                                                      Image_url
## 1                     https://rukminim1.flixcart.com/image/312/312/ku1k4280/television/p/f/6/crel7369-croma-original-imag7969pxhrwp2k.jpeg?q=70
## 2                     https://rukminim1.flixcart.com/image/312/312/krntoy80/television/u/d/y/a-3200s-adsun-original-imag5edguuyn54fh.jpeg?q=70
## 3                     https://rukminim1.flixcart.com/image/312/312/l0fm07k0/television/7/x/9/-original-imagc8fnpx39evgc.jpeg?q=70
## 4                     https://rukminim1.flixcart.com/image/312/312/kzfvzww0/television/e/b/b/32hd2a00-32-y1s-oneplus-original-imagbgcewfqywgk7.jpeg?q=70
## ...                                                                     <NA>
## 885                   https://rukminim1.flixcart.com/image/312/312/ku8pbbk0/television/d/i/p/crel7369-3yr-croma-original-imag7escqzvf4g5e.jpeg?q=70
## 886 https://rukminim1.flixcart.com/image/312/312/kz4gh3k0/television/p/v/8/t-series-smart-43-movie-plus-bezel-less-43-inch-109-cm-full-hd-original-imagb7e74mgzweb3.jpeg?q=70
## 887                   https://rukminim1.flixcart.com/image/312/312/krntoy80/television/h/i/m/a-2400n-adsun-original-imag5ecpqjfzews3.jpeg?q=70
## 888                   https://rukminim1.flixcart.com/image/312/312/kfvfwy80/television/g/m/7/sony-kd-43x8000h-original-imafw8d6evas4yxh.jpeg?q=70
```

```r
summary(df)
```

```
## Product_Name        Stars            Ratings        Reviews
## Length:888       Length:888       Min.   :     0   Min.   :     0.0
## Class :character  Class :character  1st Qu.:     0   1st Qu.:     0.0
## Mode  :character  Mode  :character  Median :     0   Median :     0.0
##                                     Mean   :  5661   Mean   :   771.8
##                                     3rd Qu.:  6698   3rd Qu.:   904.0
##                                     Max.   :663035   Max.   :67204.0
##                                     NA's   :3        NA's   :3
## current_price       MRP             channel          Operating_system
## Length:888       Length:888       Length:888       Length:888
## Class :character  Class :character  Class :character  Class :character
## Mode  :character  Mode  :character  Mode  :character  Mode  :character
##
##
##
##
## Picture_qualtiy     Speaker          Frequency        Image_url
## Length:888       Length:888       Length:888       Length:888
## Class :character  Class :character  Class :character  Class :character
## Mode  :character  Mode  :character  Mode  :character  Mode  :character
##
##
##
##
```

```r
class(df$Stars)
```

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

```r
plot_num(df) #genel histogram
```

```
## Warning: `guides(<scale> = FALSE)` is deprecated. Please use `guides(<scale> =
## "none")` instead.
```
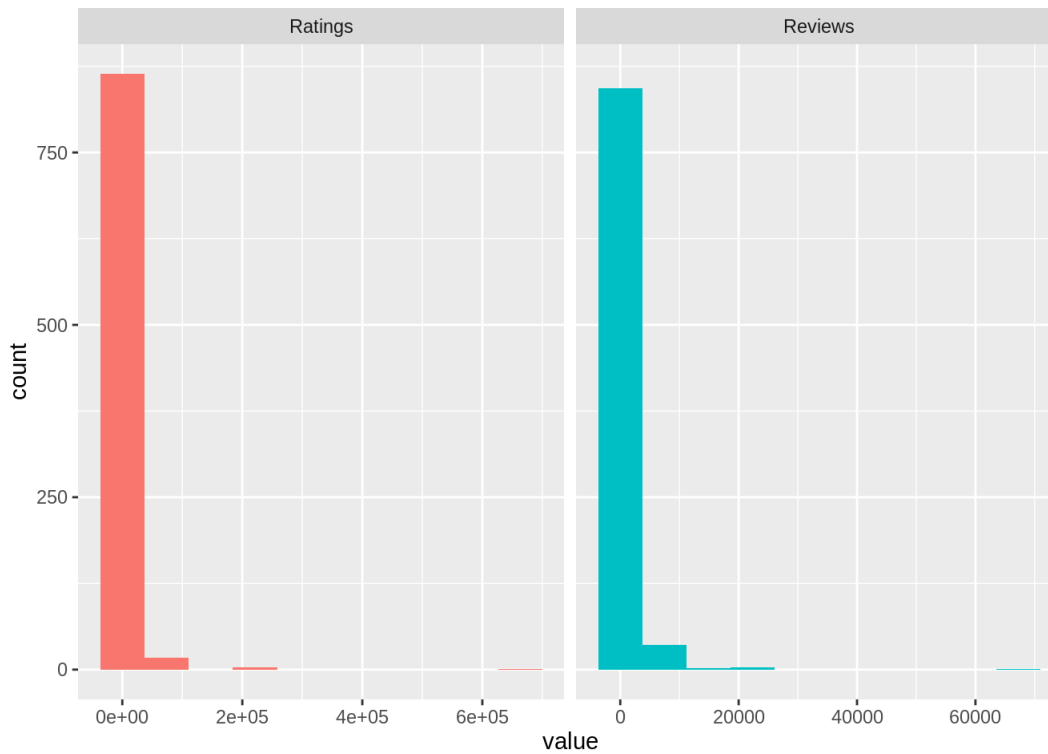

3. veri ön işleme/ temizleme

İlgilenmeyeceğim sütunlar veri setinden silindi.

```r
df$Image_url <- NULL

df$Frequency <- NULL

df$curr <- NULL
```

```
df$current_price<- str_replace(df$current_price, "[₹]", "")

df$MRP<- str_replace(df$MRP, "[₹]", "")
```

uygun değişken tiplerine dönüştürüldü.

```
df$Ratings <- as.integer(df$Ratings)

df$Reviews <- as.integer(df$Reviews)

df$current_price <- as.integer(df$current_price)

df$MRP <- as.integer(df$MRP)

df$Stars <- as.integer(df$Stars)
```

```
## Warning: NAs introduced by coercion
```

```
df$Product_Name <- as.factor(df$Product_Name)

glimpse(df)
```

```
## Rows: 888
## Columns: 10
## $ Product_Name    <fct> Croma, Adsun, LG, OnePlus, Xiaomi, SAMSUNG, OnePlus, …
## $ Stars           <int> 4, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 3, 4, 4, 4, 3, 4, 4,…
## $ Ratings         <int> 1773, 6742, 38870, 101256, 3120, 53639, 101256, 0, 58…
## $ Reviews         <int> 217, 930, 3443, 9189, 305, 4811, 9189, 0, 698, 9189, …
## $ current_price   <int> 7990, 8699, 16499, 16499, 15499, 15999, 15499, 11990,…
## $ MRP             <int> 20000, 21999, 21990, 21999, 24999, 22900, 19999, 2500…
## $ channel         <chr> "HD Ready 1366 x 768 Pixels", "Netflix|Disney+Hotstar…
## $ Operating_system <chr> "20 Speaker Output", "Operating System: Android Based…
## $ Picture_qualtiy  <chr> "60 Hz Refresh Rate", "HD Ready 1366 x 768 Pixels", "…
## $ Speaker          <chr> "2 x HDMI | 2 x USB", "20 W Speaker Output", "10 W Sp…
```

```
df[df==""] <- NA

#eksik gözlem tespit için boş gözlemlere NA eklendi.
```

eksik verilerin yapısını inceleme

ho: eksik veriler rastgele dağılmıştır. h1: eksik veriler rastgele dağılmamıştır.

```
test<- mcar_test(df)
test
```

```
## # A tibble: 1 × 4
##   statistic    df p.value missing.patterns
##       <dbl> <dbl>   <dbl>            <int>
## 1      2.73     1  0.0987                2
```

```
#p.value<0.5 ho kabul edilemez.
# sonuç: %5 anlamlılık düzeyinde eksik veriler rastgele dağılmamıştır.
```

```
#testin sonucunun doğruluğunu anlayabilmek ve çözüm bulabilmek için aşağıdaki adımlar izlendi.

sum(is.na(df))      #toplam
```

```
## [1] 27
```

```
colSums(is.na(df))
```

```
##     Product_Name            Stars          Ratings          Reviews
##                0                3                3                3
##    current_price              MRP          channel Operating_system
##                3                3                3                3
##  Picture_qualtiy          Speaker
##                3                3
```
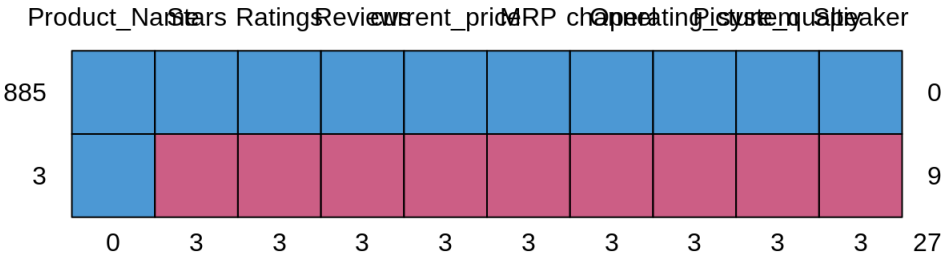
```
which(is.na(df))
```

```
##  [1] 1164 1255 1485 2052 2143 2373 2940 3031 3261 3828 3919 4149 4716 4807 5037
## [16] 5604 5695 5925 6492 6583 6813 7380 7471 7701 8268 8359 8589
```

#eksik veriler azdır.

md.pattern(df) *#eksikliklerin aynı satırlarda olduğunu gördük. (rastgele değil) (bazı ürünler için verilerin eksiklikten ziyade yokluk olduğunu görüyoruz.)*


```
##    Product_Name Stars Ratings Reviews current_price MRP channel
## 885          1     1       1       1           1   1       1
## 3            1     0       0       0           0   0       0
##              0     3       3       3           3   3       3
##    Operating_system Picture_qualtiy Speaker
## 885             1            1     1 0
## 3               0            0     0 9
##                 3            3     3 27
```

df[!complete.cases(df),] *#en az bir tane eksik olanlari dondurerek eksik satırları tespit ettikç veri setinden silerek eksik gözlem sorununu ortadan kaldırabiliriz.*

```
##                                                                                                         Product_Name
## 276                                                                                                    4 x HDMI | 3 x USB
## 367 https://rukminim1.flixcart.com/image/312/312/kwpam4w0/television/z/o/q/ua32t4450-ua32t4450-samsung-original-imag9bhf3khyggpu.jpeg?q=70
## 597            https://rukminim1.flixcart.com/image/312/312/television/e/s/r/micromax-40-canvas-s-original-imaerywuznsqc7pk.jpeg?q=70
##    Stars Ratings Reviews current_price MRP channel Operating_system
## 276  NA     NA      NA      NA NA  <NA>         <NA>
## 367  NA     NA      NA      NA NA  <NA>         <NA>
## 597  NA     NA      NA      NA NA  <NA>         <NA>
##    Picture_qualtiy Speaker
## 276          <NA>    <NA>
## 367          <NA>    <NA>
## 597          <NA>    <NA>
```
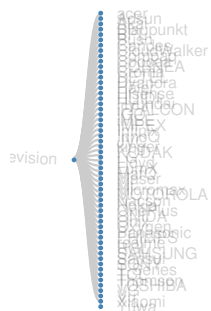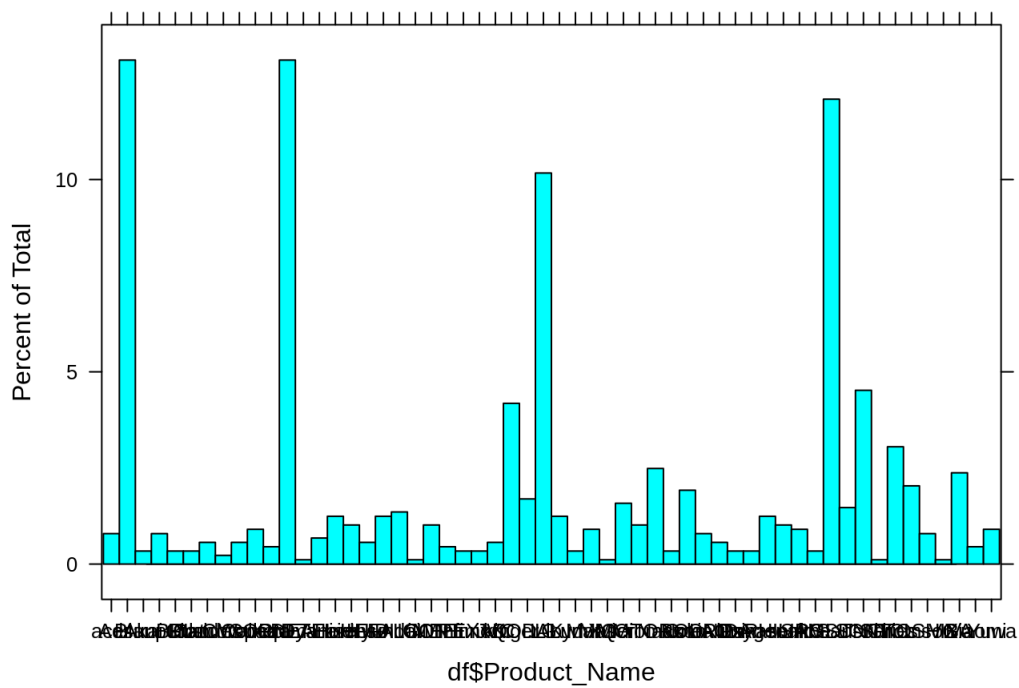
eksik veri silme

```
df=na.omit(df)
```

veriyi daha iyi anlayabilmek

```
d3tree(list(root = df2tree(rootname ='television',
                struct = as.data.frame(df)),
            layout = 'collapse'))
```

histogram(df$Product_Name)


```
markaadedi<- df %>% group_by(Product_Name) %>% tally() %>% arrange(n, decreasing=T)

markaadedi
```

```
## # A tibble: 56 × 2
##    Product_Name    n
##    <fct>        <int>
## 1 Adsun          116
## 2 Croma          116
## 3 SAMSUNG        107
## 4 LG              90
## 5 SONY            40
## 6 kinger          37
## 7 TCL             27
## 8 MOTOROLA        22
## 9 Vu              21
## 10 Thomson        18
## # … with 46 more rows
## # i Use `print(n = ...)` to see more rows
```
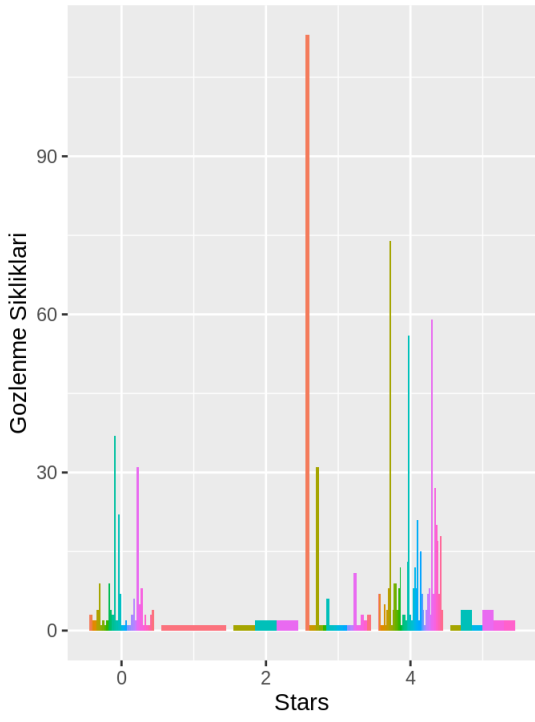
#en fazla 3 ürün ADSUN,CROMA ve Samsung markasına aittir.

```
ggplot(df,aes(Product_Name, fill=Product_Name))+
  geom_bar()+
  coord_polar(theta = "y")
```
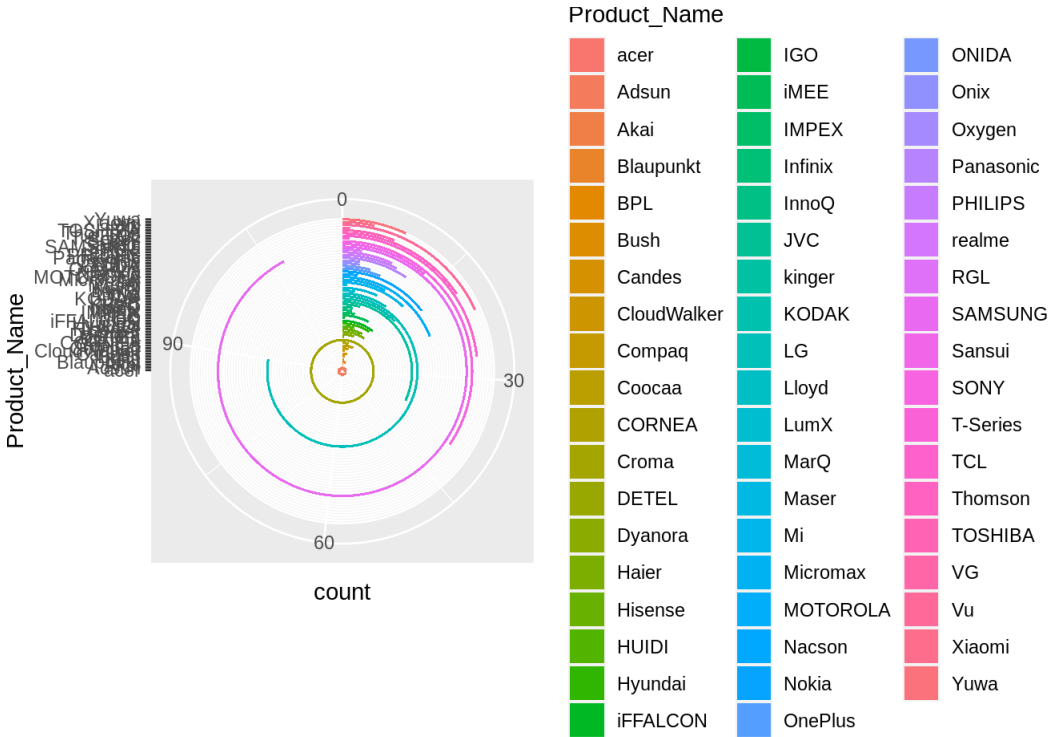


```
ggplot(df, aes(Stars, fill = Product_Name)) +
  geom_bar(position = position_dodge()) +
  ggtitle("Markaların aldıkları yıldızlar") +
  xlab("Stars") +
  ylab("Gozlenme Siklikleri")
```

Markaların aldıkları yıldızlar

Product_Name

acer	IGO	ONIDA
Adsun	iMEE	Onix
Akai	IMPEX	Oxygen
Blaupunkt	Infinix	Panasonic
BPL	InnoQ	PHILIPS
Bush	JVC	realme
Candes	kinger	RGL
CloudWalker	KODAK	SAMSUNG
Compaq	LG	Sansui
Coocaa	Lloyd	SONY
CORNEA	LumX	T-Series
Croma	MarQ	TCL
DETEL	Maser	Thomson
Dyanora	Mi	TOSHIBA
Haier	Micromax	VG
Hisense	MOTOROLA	Vu
HUIDI	Nacson	Xiaomi
Hyundai	Nokia	Yuwa
iFFALCON	OnePlus	

```
#en çok ürünü olan 3 marka
df3<- df %>%
  filter(Product_Name == "Adsun" |
      Product_Name == "Croma" |
      Product_Name == "SAMSUNG")
```
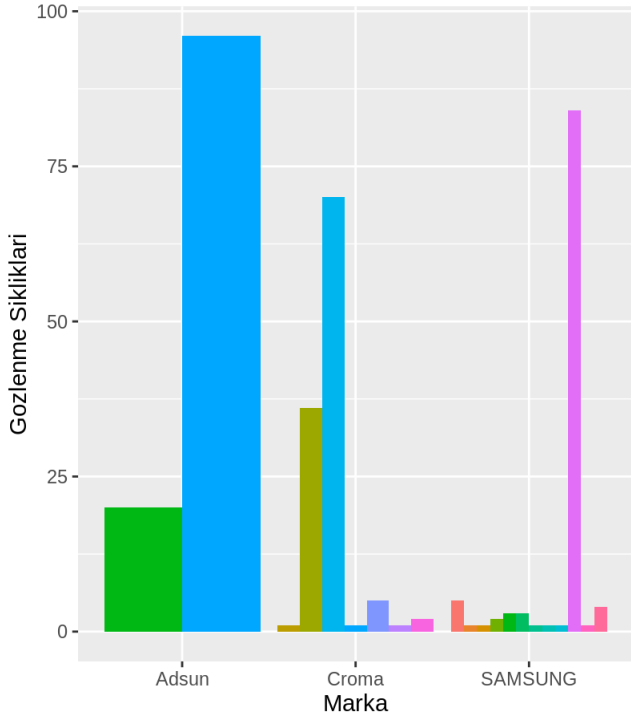
```
ggplot(df3, aes(Product_Name, fill = Operating_system)) +
  geom_bar(position = position_dodge()) +
  ggtitle("markalara göre kullandıkları operating system") +
  xlab("Marka") +
  ylab("Gozlenme Sikliklari")
```

markalara göre kullandıkları operating system

Operating_system

10 W Speaker Output
10 W Speaker Output for optimal sound
14 W Speaker Output
16 Speaker Output
20 Speaker Output
20 w Speaker Output
20 W Speaker Output
40 W Speaker Output
60 W Speaker Output
60 Watts Speaker Output
HD Ready 1
Operating System: Android
Operating System: Android Based
Operating System: FireTv OS 6
Operating System: FireTv OS 7
Operating System: Tizen
Operating System: WebOS
Ultra HD (4K) 3840 x 2160 Pixels
Ultra HD (4K) 3840x2160 Pixels

```
a<- df %>% dplyr::select(Product_Name, Stars) %>%
  filter(Product_Name== "Adsun") %>%
  summarise(adsun_ortalama = mean(Stars))

b<- df %>% dplyr::select(Product_Name, Stars) %>%
  filter(Product_Name== "Croma") %>%
  summarise(croma_ortalama = mean(Stars))

c<- df %>% dplyr::select(Product_Name, Stars) %>%
  filter(Product_Name== "SAMSUNG") %>%
  summarise(Samsung_ortalama = mean(Stars))


d<- df %>% dplyr::select(Product_Name, Stars) %>%
  filter(Product_Name== "LG") %>%
  summarise(Lg_ortalama = mean(Stars))



data.frame(a,b,c,d) #en çok ürünü bulunan 4markanın ortalama aldığı yıldızlar
```
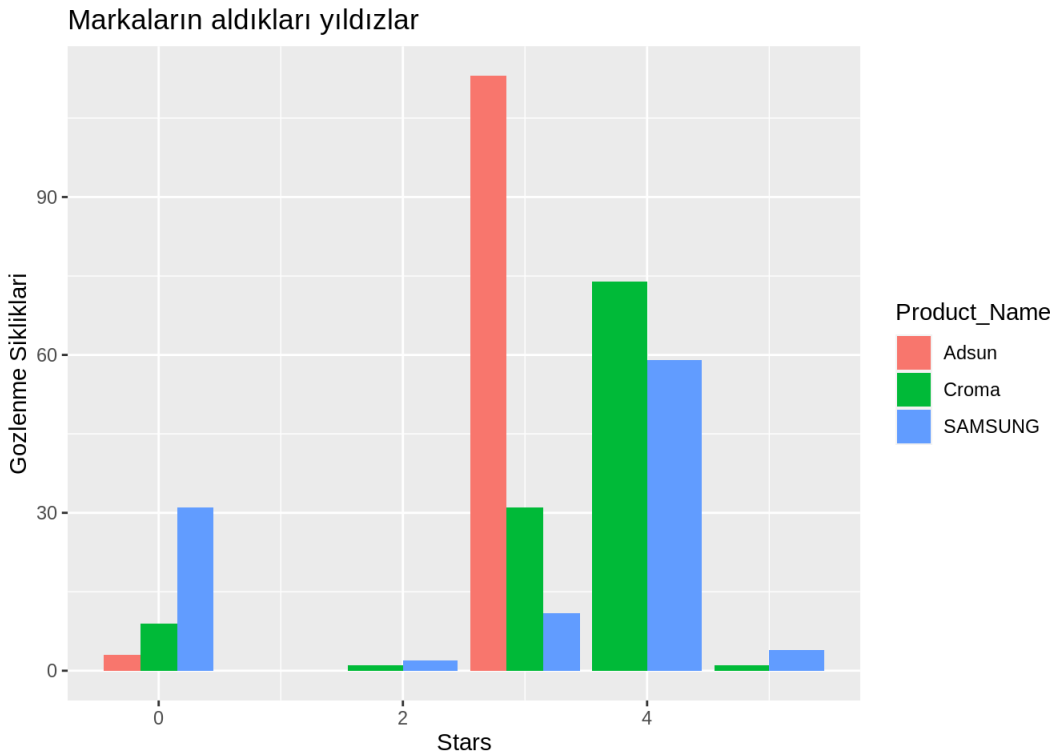
```
##   adsun_ortalama croma_ortalama Samsung_ortalama Lg_ortalama
## 1       2.922414       3.413793         2.738318    2.955556
```

```
ggplot(df3, aes(Stars, fill = Product_Name)) +
  geom_bar(position = position_dodge()) +
  ggtitle("Markaların aldıkları yıldızlar") +
  xlab("Stars") +
  ylab("Gozlenme Sikliklari")
```

Markaların aldıkları yıldızlar


```
ggplot(df3, aes(Product_Name, fill = Operating_system)) +
  geom_bar(position = position_dodge()) +
  ggtitle("markalara göre kullandıkları operating system") +
  xlab("Marka") +
  ylab("Gozlenme Sikliklari")
```

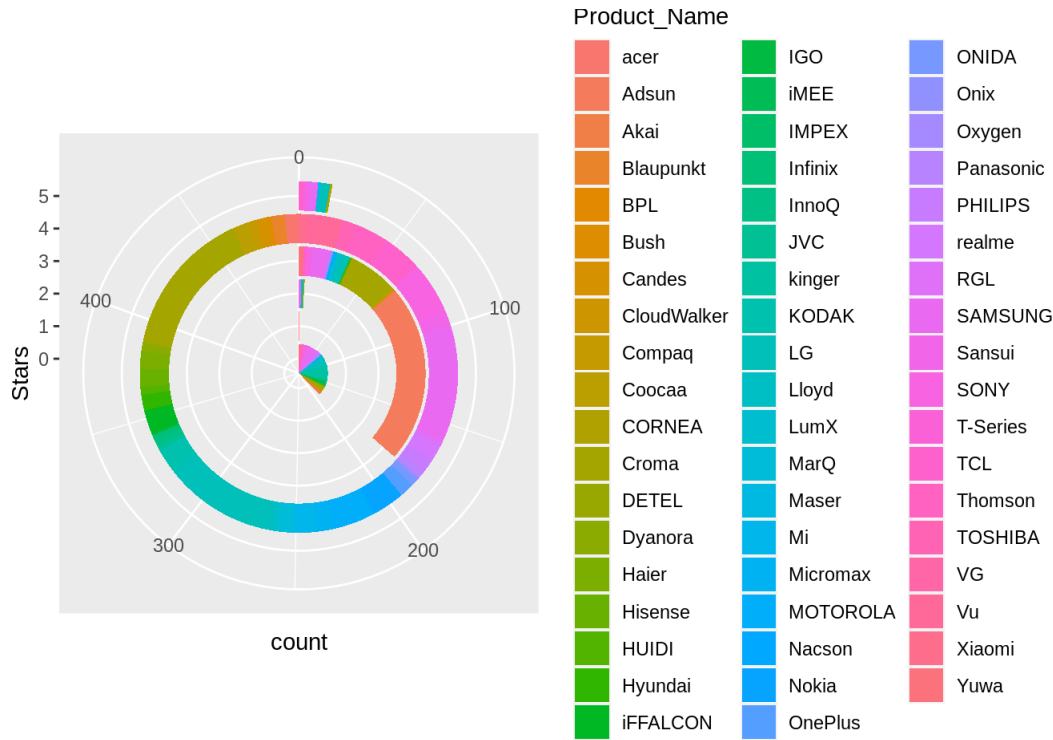# markalara göre kullandıkları operating system

Operating_system
- 10 W Speaker Output
- 10 W Speaker Output for optimal sound
- 14 W Speaker Output
- 16 Speaker Output
- 20 Speaker Output
- 20 w Speaker Output
- 20 W Speaker Output
- 40 W Speaker Output
- 60 W Speaker Output
- 60 Watts Speaker Output
- HD Ready 1
- Operating System: Android
- Operating System: Android Based
- Operating System: FireTv OS 6
- Operating System: FireTv OS 7
- Operating System: Tizen
- Operating System: WebOS
- Ultra HD (4K) 3840 x 2160 Pixels
- Ultra HD (4K) 3840x2160 Pixels


```
ggplot(df,aes(Stars, fill=Product_Name))+
  geom_bar()+
  coord_polar(theta = "y")
```

Product_Name

acer	IGO	ONIDA
Adsun	iMEE	Onix
Akai	IMPEX	Oxygen
Blaupunkt	Infinix	Panasonic
BPL	InnoQ	PHILIPS
Bush	JVC	realme
Candes	kinger	RGL
CloudWalker	KODAK	SAMSUNG
Compaq	LG	Sansui
Coocaa	Lloyd	SONY
CORNEA	LumX	T-Series
Croma	MarQ	TCL
DETEL	Maser	Thomson
Dyanora	Mi	TOSHIBA
Haier	Micromax	VG
Hisense	MOTOROLA	Vu
HUIDI	Nacson	Xiaomi
Hyundai	Nokia	Yuwa
iFFALCON	OnePlus	


```
ggplot(df3, aes(Stars , current_price)) +
  geom_point(size = 2,
        shape = 21,
        stroke = 1,
        color = "black",
        fill = "orange") +
  geom_smooth(color = "red") +
  ggtitle("Adsun-LG-Samsung markalarının fiyat ve yıldızlar arasındaki korelasyonu")
```

```
## `geom_smooth()` using method = 'loess' and formula 'y ~ x'
```

Adsun-LG-Samsung markalarının fiyat ve yıldızlar arasındaki korelasyonu