Properties of Stars (Visual)

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```
#Analyze astronomical data to inspect properties of stars like their luminosity, temperature and astral class.
#Download necessary packages
library(tidyverse)
```

```
## ── Attaching packages ─────────────────────────────────────── tidyverse 1.3.0 ──
```

```
## ✓ ggplot2 3.3.2     ✓ purrr   0.3.4
## ✓ tibble  3.0.3     ✓ dplyr   1.0.2
## ✓ tidyr   1.1.0     ✓ stringr 1.4.0
## ✓ readr   1.3.1     ✓ forcats 0.5.0
```

```
## ── Conflicts ────────────────────────────────────────── tidyverse_conflicts() ──
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(dslabs)
data(stars)
options(digits = 3)
```

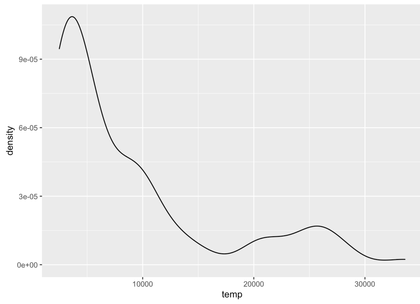
```
#Absolute magnitude shows the stars luminosity where negative values have the highest luminosity
stars$magnitude
```

```
##  [1]  4.8  1.4 -3.1 -0.4  4.3  0.5 -0.6 -7.2  2.6 -5.7 -2.4 -5.3  2.2 -0.8 -3.4
## [16] -5.2  2.0  1.0 -7.2 -4.7 -0.8 -4.0 -5.2 -3.4 -4.3  1.2 -0.5 -5.1  5.8 -1.1
## [31] -0.6 -1.6 -6.2 -4.6 -5.9  0.2  0.4 -2.3 -0.3 -5.6 -0.1 -1.7 -3.3 -2.1 -8.0
## [46]  0.0  0.6 -4.6 -4.8  0.6 15.5  5.8 13.2 16.7 10.5 15.5 16.0  1.4 11.2 13.1
## [61] 14.8  6.1 13.5 14.5 10.4 13.4  7.0  7.6  8.4 11.2 11.9  5.7  2.6 13.0  9.6
## [76] 17.0 14.1 11.9  8.7 10.9 11.9 13.3 12.1 13.1 15.0 14.2 14.0 10.3  2.2 11.0
## [91]  6.0 11.1 12.8  5.8  7.5 11.7
```

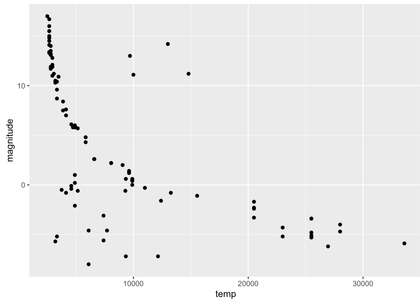
```
#Mean magnitude
mean(stars$magnitude)
```

```
## [1] 4.26
```

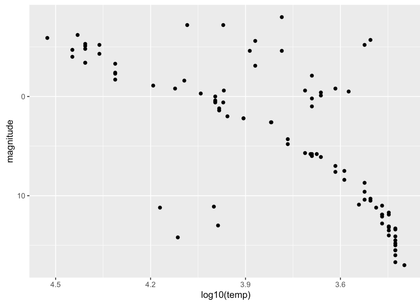
```
#Plotting the stars temperature to analyze distribution. Majority of stars have low temperature
stars%>%
  ggplot(aes(temp))+
  geom_density()
```



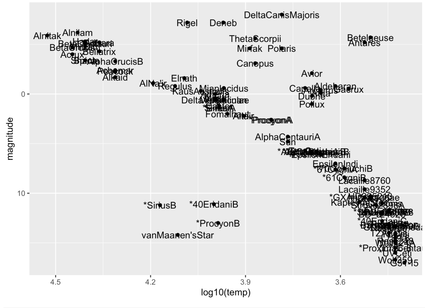

```
#Plotting with temperature and magnitude of stars
stars%>%
  ggplot(aes(temp,magnitude)) +
  geom_point()
```



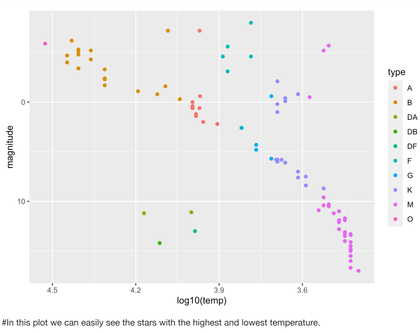

```
#Adding different ways of looking at data
#We take log base 10 of the temperature then flipping on x axis
#Brightest stars with the highest temps are on the upper left hand corner
stars%>%
  ggplot(aes(log10(temp),magnitude)) +
  geom_point()+
  scale_x_reverse()+
  scale_y_reverse()
```




```
#Adding stars names to plot
stars %>%
  ggplot(aes(log10(temp),magnitude))+
  geom_point()+
  geom_text(aes(label=star))+
  scale_x_reverse()+
  scale_y_reverse()
```




```
#Now we remove the text labels and add color to the points by star type.
#This classification describes the properties of the stars spectrums, the amount of light produced at various wav
elengths.
stars%>%
  ggplot(aes(log10(temp), magnitude, col=type))+
  geom_point()+
  scale_x_reverse()+
  scale_y_reverse()
```



#In this plot we can easily see the stars with the highest and lowest temperature.