World Happiness Report 2019

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R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.1 --
```

```
## v ggplot2 3.3.5     v purrr   0.3.4
## v tibble  3.1.4     v dplyr   1.0.7
## v tidyr   1.1.3     v stringr 1.4.0
## v readr   2.0.1     v forcats 0.5.1
```

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

```
happiness <- read.csv("2019.csv")

happiness <- happiness%>%
  rename('Ranking'=Overall.rank) %>%
  rename('Country'=Country.or.region) %>%
  rename('GDP_per_capita'=GDP.per.capita) %>%
  rename('Social_support'=Social.support) %>%
  rename('Health_life_expectancy'=Healthy.life.expectancy) %>%
  rename('Freedom_to_make_life_choices'=Freedom.to.make.life.choices) %>%
  rename('Perception_of_corruption'=Perceptions.of.corruption)

#Top Happiest and Unhappiest Countries

top_5_highest <- head(happiness, n=5)

top_5_lowest <- tail(happiness, n=5)

#Graph of the top Happiest Score countries
top5h <- data.frame(Country=top_5_highest[,2],
                    Score=top_5_highest[,3])
top5h
```

```
##       Country Score
## 1     Finland 7.769
## 2     Denmark 7.600
## 3      Norway 7.554
## 4     Iceland 7.494
## 5 Netherlands 7.488
```

```
top5l <- data.frame(Country=top_5_lowest[,2],
                    Score=top_5_lowest[,3])
top5l
```

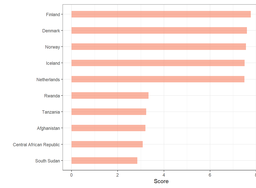
```
##                Country Score
## 1               Rwanda 3.334
## 2             Tanzania 3.231
## 3          Afghanistan 3.203
## 4 Central African Republic 3.083
## 5          South Sudan 2.853
```

```
data <- rbind(top5h,top5l)

data
```

```
##                  Country Score
## 1                Finland 7.769
## 2                Denmark 7.600
## 3                 Norway 7.554
## 4                Iceland 7.494
## 5            Netherlands 7.488
## 6                 Rwanda 3.334
## 7               Tanzania 3.231
## 8            Afghanistan 3.203
## 9  Central African Republic 3.083
## 10            South Sudan 2.853
```

```
data %>%
  mutate(Country = fct_reorder(Country, Score)) %>%
  ggplot(aes(x=Country, y=Score)) +
  geom_bar(stat="identity", fill="#f68060", alpha=.6, width=.4) +
  coord_flip() +
  xlab("") +
  theme_bw()
```




```
#Calculate the average Happiness Score
avg<-mean(happiness$Score)
avg
```

```
## [1] 5.407096
```

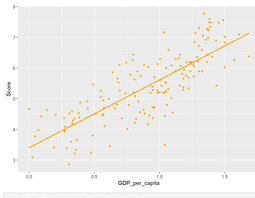
```
happiness2 <- happiness[,2:3]
happiness3 <- happiness2%>%
  mutate(Level=case_when((Score<avg)~'Below',
                         (Score==avg)~'Equal',
                         (Score>avg)~'Above'))

head(happiness3)
```

```
##       Country Score Level
## 1     Finland 7.769 Above
## 2     Denmark 7.600 Above
## 3      Norway 7.554 Above
## 4     Iceland 7.494 Above
## 5 Netherlands 7.488 Above
## 6 Switzerland 7.480 Above
```

```
#Correlation
GDP_vs_score <- happiness%>%
  ggplot(aes(x=GDP_per_capita,y=Score))+
  geom_point(color='orange')+
  geom_smooth(method='lm', se=FALSE, color='orange')
GDP_vs_score
```

```
## `geom_smooth()` using formula 'y ~ x'
```

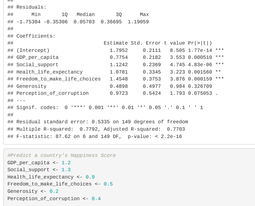



```
cor(happiness$GDP_per_capita,happiness$Score)
```

```
## [1] 0.7938829
```

```
social_vs_score <- happiness%>%
  ggplot(aes(x=Social_support,y=Score))+
  geom_point(color='purple')+
  geom_smooth(method='lm', se=FALSE, color='purple')
social_vs_score
```

```
## `geom_smooth()` using formula 'y ~ x'
```




```
cor(happiness$Social_support,happiness$Score)
```

```
## [1] 0.7770578
```

```
health_vs_score <- happiness%>%
  ggplot(aes(x=Health_life_expectancy, y=Score))+
  geom_point(color='pink')+
  geom_smooth(method='lm', se=FALSE, color='pink')
health_vs_score
```

```
## `geom_smooth()` using formula 'y ~ x'
```



```
cor(happiness$Health_life_expectancy,happiness$Score)
```

```
## [1] 0.7798831
```

```
#Linear model
linear_model <- lm(Score~.-Ranking-Country,happiness)
linear_model
```

```
##
## Call:
## lm(formula = Score ~ . - Ranking - Country, data = happiness)
##
## Coefficients:
##                  (Intercept)                GDP_per_capita
##                       1.7952                        0.7754
##               Social_support       Health_life_expectancy
##                       1.1242                        1.0781
## Freedom_to_make_life_choices                    Generosity
##                       1.4548                        0.4898
##     Perception_of_corruption
##                       0.9723
```

```
summary(linear_model)
```

```
##
## Call:
## lm(formula = Score ~ . - Ranking - Country, data = happiness)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -1.75304 -0.35306  0.05703  0.36695  1.19059
##
## Coefficients:
##                                 Estimate Std. Error t value Pr(>|t|)
## (Intercept)                       1.7952     0.2111   8.505 1.77e-14 ***
## GDP_per_capita                    0.7754     0.2182   3.553 0.000516 ***
## Social_support                    1.1242     0.2369   4.745 4.83e-06 ***
## Health_life_expectancy            1.0781     0.3345   3.223 0.001560 **
## Freedom_to_make_life_choices      1.4548     0.3753   3.876 0.000159 ***
## Generosity                        0.4898     0.4977   0.984 0.326709
## Perception_of_corruption          0.9723     0.5424   1.793 0.075053 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.5335 on 149 degrees of freedom
## Multiple R-squared:  0.7792, Adjusted R-squared:  0.7703
## F-statistic: 87.62 on 6 and 149 DF,  p-value: < 2.2e-16
```

```
#Predict a country's Happiness Score
GDP_per_capita <- 1.2
Social_support <- 1.3
Health_life_expectancy <- 0.9
Freedom_to_make_life_choices <- 0.5
Generosity <- 0.2
Perception_of_corruption <- 0.4

y = 1.7952 + 0.7754*GDP_per_capita + 1.1242*Social_support +
    1.0781*Health_life_expectancy + 1.4548*Freedom_to_make_life_choices +
    0.4898*Generosity + 0.9723*Perception_of_corruption
y
```

```
## [1] 6.37171
```