Marathon Data

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Motivational Video

Are we living in a time of records?

How can we address this question?

What would randomness look like?

Getting Data

```
library(tidyverse)
library(rvest)
library(lubridate)
theme_set(theme_bw())

url = "https://en.wikipedia.org/wiki/Marathon_world_record_progression"

marathon_html = read_html(url)

marathon_html %>%
  html_nodes(css = "table")
```

```
## {xml_nodeset (5)}
## [1] <table class="wikitable" style="font-size: 95%;"><tbody>\n<tr style="back ...
## [2] <table class="wikitable" style="font-size: 95%;"><tbody>\n<tr style="back ...
## [3] <table class="nowraplinks mw-collapsible autocollapse navbox-inner" style ...
## [4] <table class="nowraplinks navbox-subgroup" style="border-spacing:0"><tbod ...
## [5] <table class="nowraplinks hlist mw-collapsible autocollapse navbox-inner" ...
```

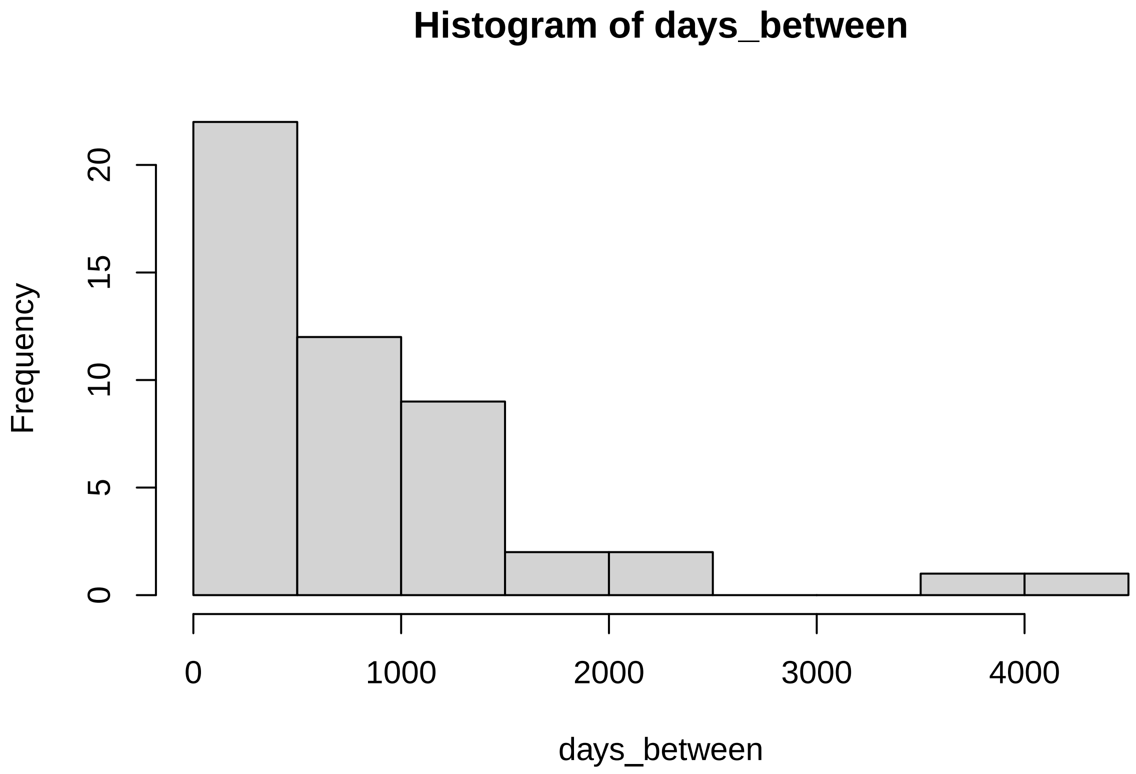
```
record_table =
  marathon_html %>%
  html_nodes(css = "table") %>%
  nth(1) %>%
  html_table(fill = TRUE)

print(record_table)
```

```
## # A tibble: 50 x 7
##    Time      Name                Nationality    Date          Event~1 Source Notes
##    <chr>     <chr>              <chr>          <chr>         <chr>   <chr>   <chr>
##  1 2:55:18.4 Johnny Hayes       United States  July 24, 19~ London~ IAAF[~ "Tim~
##  2 2:52:45.4 Robert Fowler      United States  January 1, ~ Yonker~ IAAF[~ "Not~
##  3 2:46:52.8 James Clark        United States  February 12~ New Yo~ IAAF[~ "Not~
##  4 2:46:04.6 Albert Raines      United States  May 8, 1909  New Yo~ IAAF[~ "Not~
##  5 2:42:31.0 Henry Barrett      United Kingdom May 8, 1909~ Polyte~ IAAF[~ "Not~
##  6 2:40:34.2 Thure Johansson    Sweden         August 31, ~ Stockh~ IAAF[~ "Not~
##  7 2:38:16.2 Harry Green        United Kingdom May 12, 1913 Polyte~ IAAF[~ "Not~
##  8 2:36:06.6 Alexis Ahlgren     Sweden         May 31, 1913 Polyte~ IAAF[~ "Rep~
##  9 2:38:00.8 Umberto Blasi      Italy          November 29~ Legnan~ ARRS[~ ""
## 10 2:32:35.8 Hannes Kolehmainen Finland        August 22, ~ Antwer~ IAAF,~ "The~
## # ... with 40 more rows, and abbreviated variable name 1: `Event/Place`
## # i Use `print(n = ...)` to see more rows
```

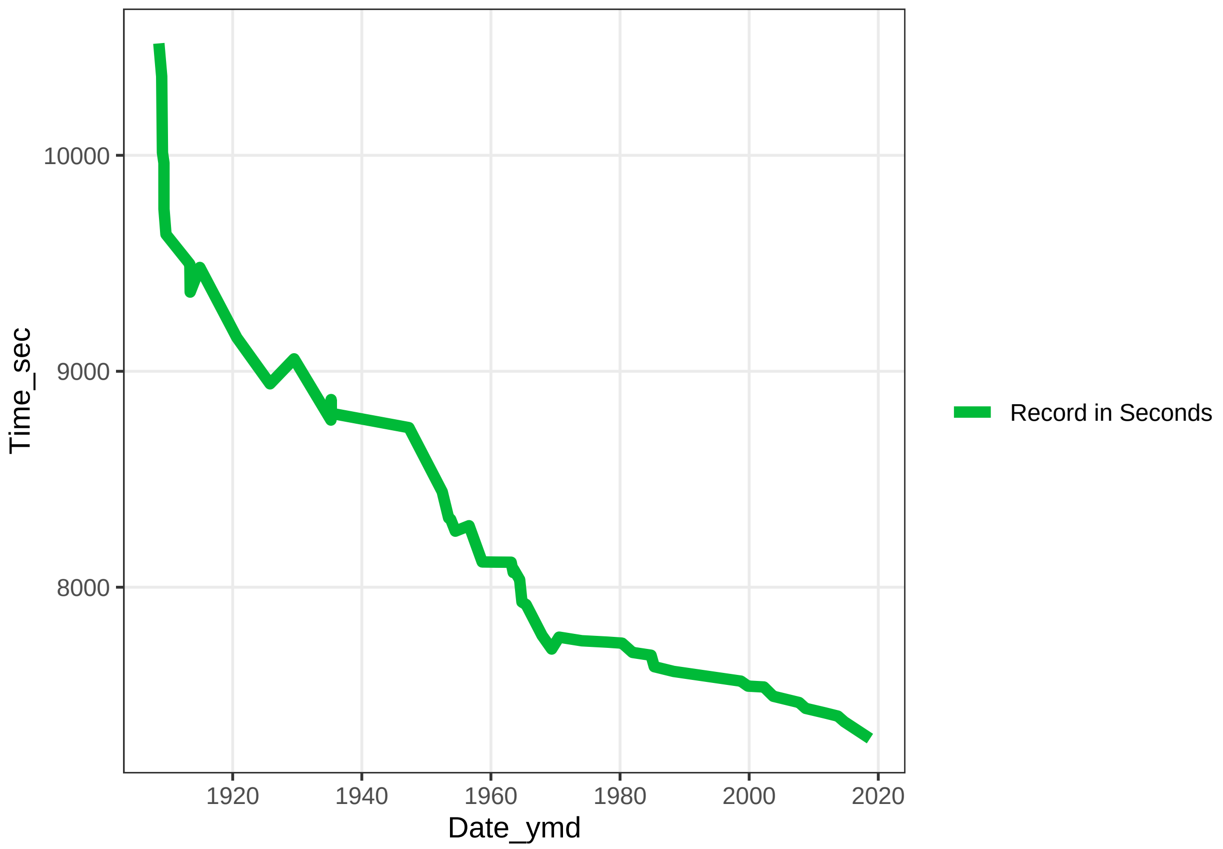
```
record_table_mod =
  record_table %>%
  mutate(Time_t = hms(Time))%>%
  mutate(Time_sec = period_to_seconds(Time_t))

diff(record_table_mod$Time_t)
```

```
##  [1]  27.0   7.4 -48.2  26.4   3.2 -18.0  -9.6  -5.8  35.0 -34.0  55.8 -43.6
## [13]  35.0  -5.0  -2.0  -3.0   3.2  -1.8  -5.6   4.6 -34.6  12.2  -0.8  -0.4
## [25]  12.2  15.0  12.0 -43.8 -11.2  36.4  -2.8  -4.8 -16.8  -6.4  -4.6  17.0
## [37] -13.0   7.0  38.0 -45.0  37.0  -4.0  17.0 -29.0  33.0 -21.0 -15.0  34.0
## [49] -18.0
## attr(,"class")
## [1] "Period"
## attr(,"class")attr(,"package")
## [1] "lubridate"
```

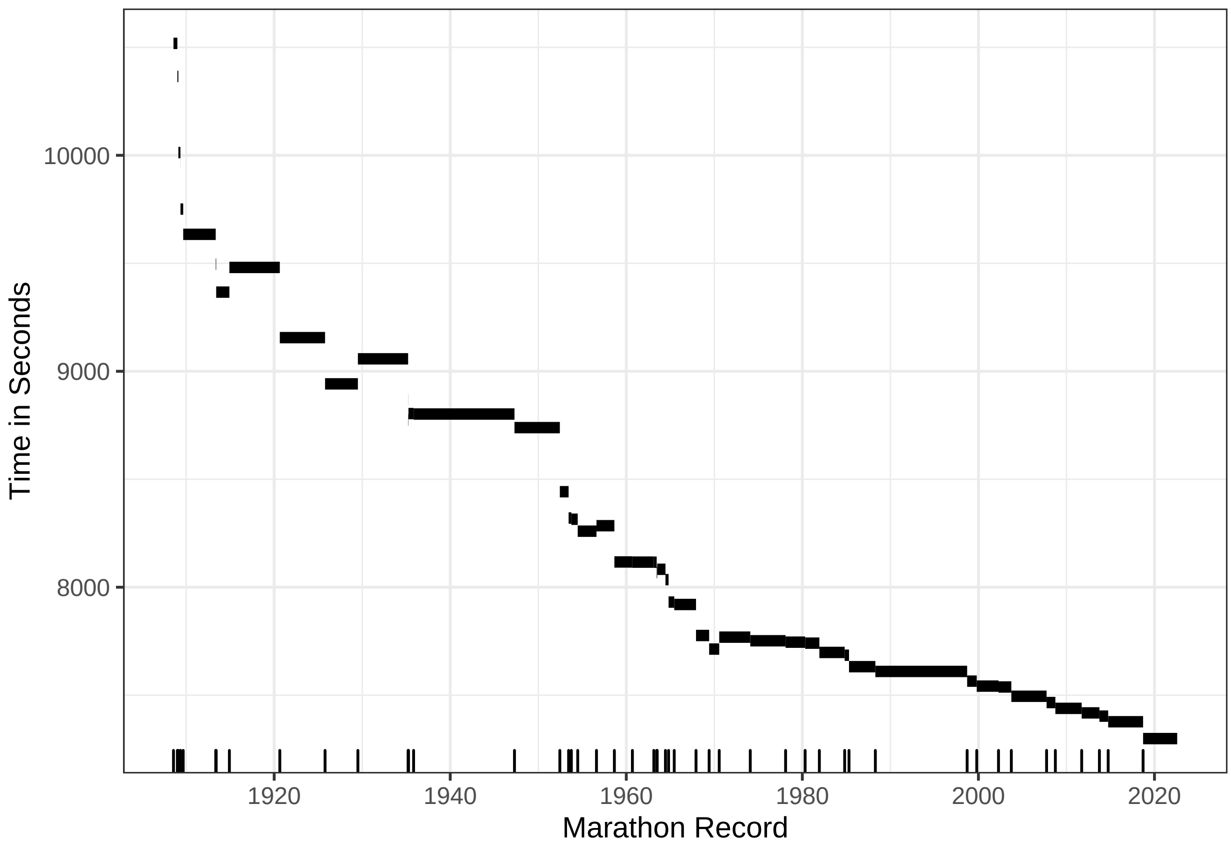
```
record_table_mod =
  record_table_mod %>%
  mutate(Date_ymd = mdy(Date))


record_table_mod$Date_ymd[5] = "1909-05-10"

days_between = as.numeric(diff(record_table_mod$Date_ymd))


hist(days_between)
```



```
record_table_mod %>% ggplot() +
  geom_line(aes(x=Date_ymd, y=Time_sec, color = "Record in Seconds"),size=2) +
  scale_color_manual(name="",
                     values = c("Record in Seconds"="#00ba38")) +
  theme(panel.grid.minor = element_blank())
```



```
record_table_mod$end = c(record_table_mod$Date_ymd[-1],"2022-08-01")


ggplot() +
  geom_segment(data=record_table_mod, aes(x=Date_ymd,xend=end,y=Time_sec,yend=Time_sec),size=2) +
  ylab("Time in Seconds")+
  xlab("Marathon Record")+
  geom_rug(data=record_table_mod,aes(x=Date_ymd,y=Time_sec,),sides="b")
```



Questions to explore:

Are there issues with the data? What is our response variable? What type of data is it?