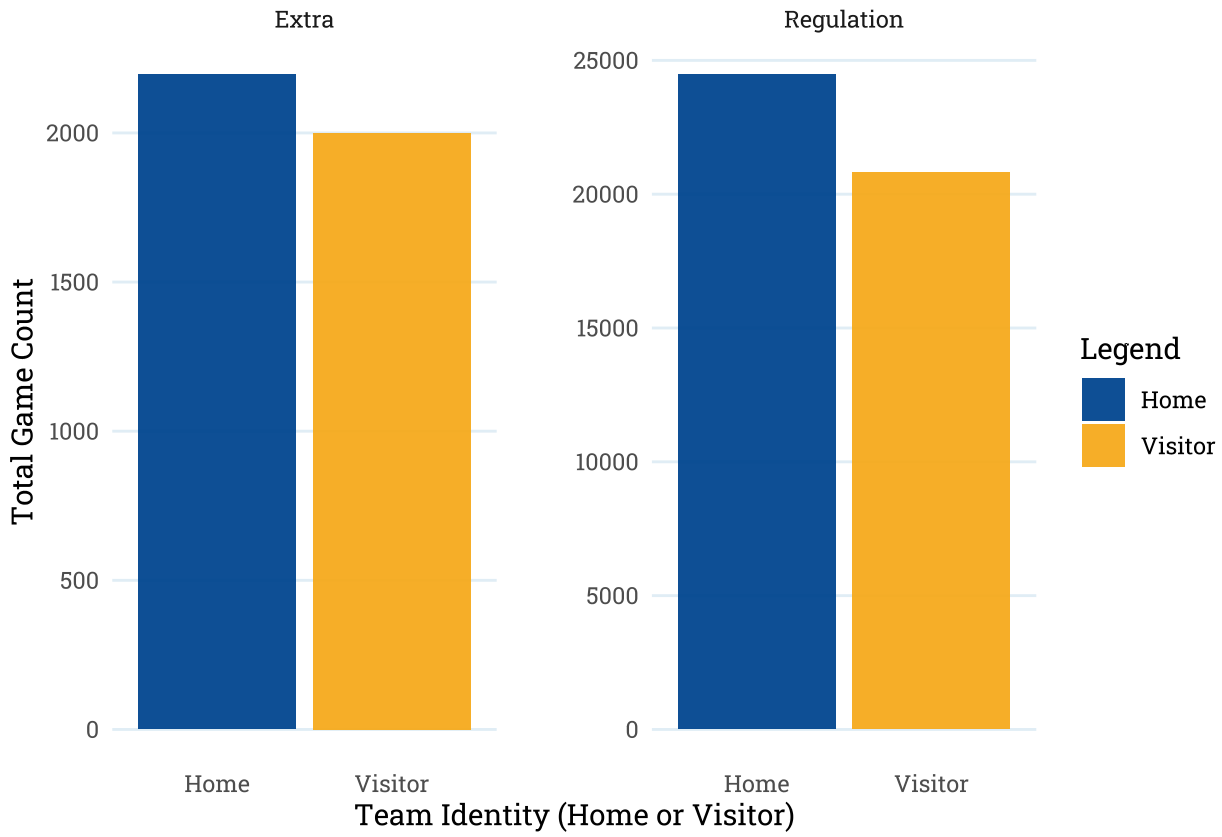
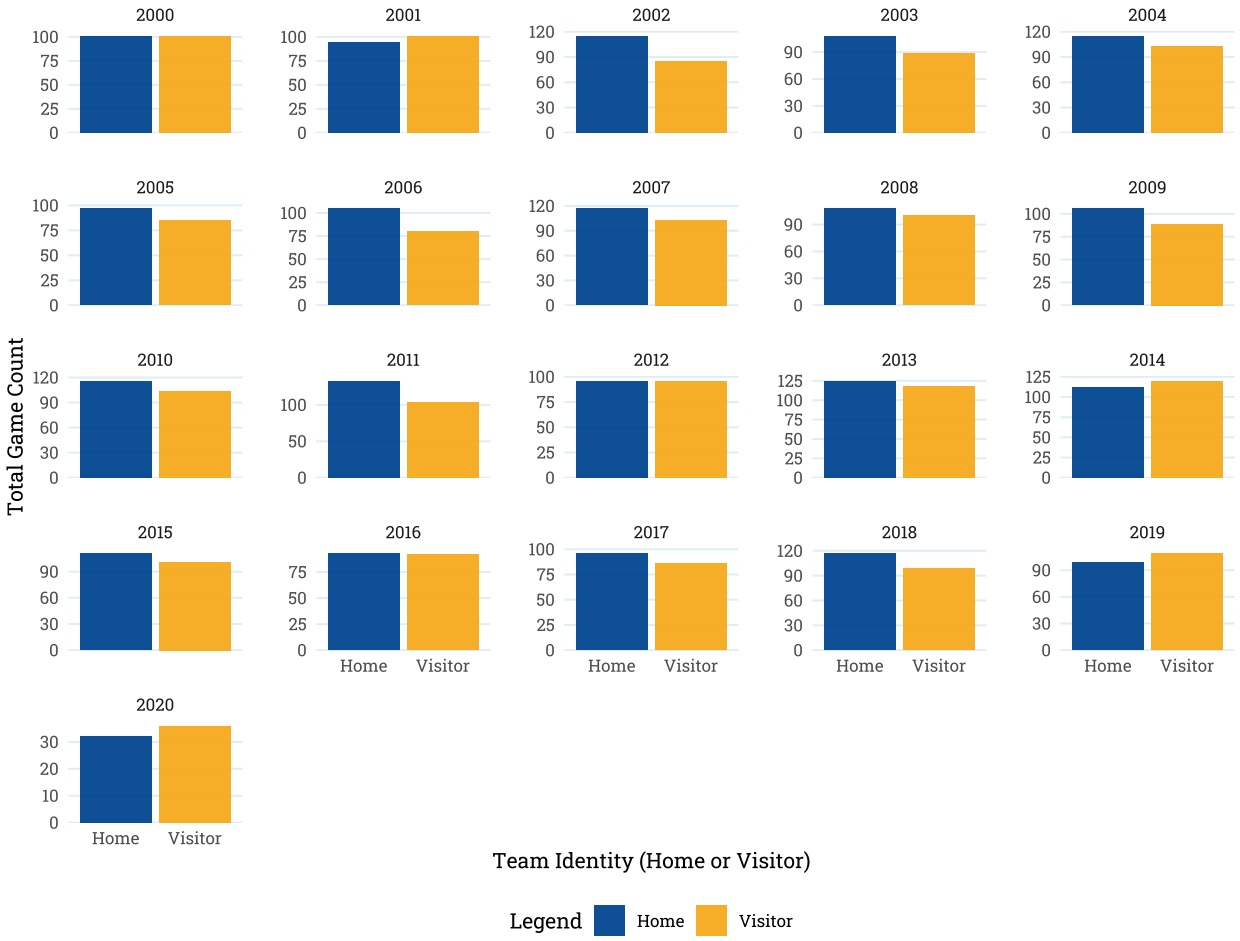
extra_innings

Paul A. Hodgetts

02/03/2021




2000
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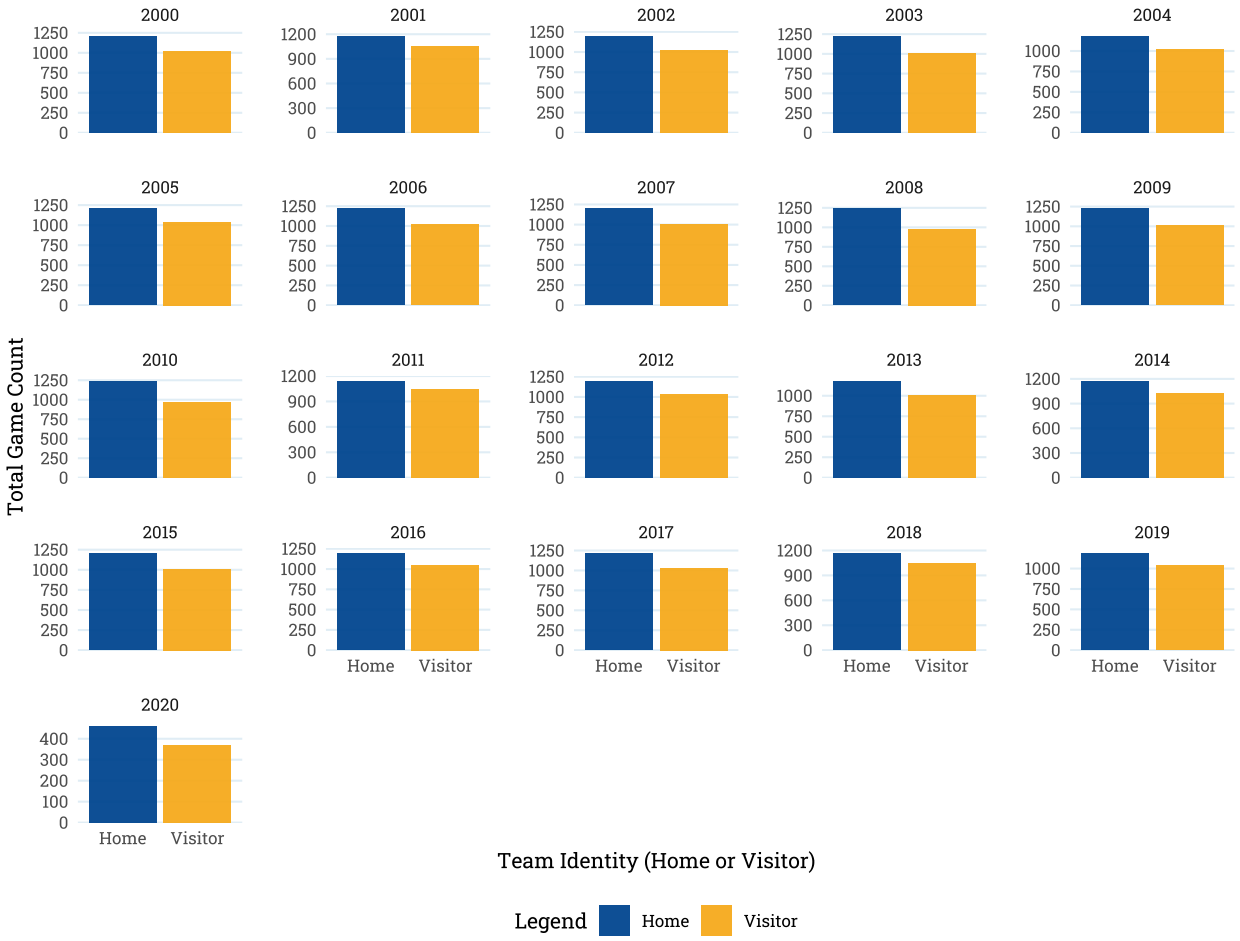
2014
2015
2016
2017
2018
2019
2020
Home
Visitor
Total Game Count
Team Identity (Home or Visitor)
Legend
Home
Visitor


2000
2001
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2014
2015
2016
2017
2018
2019
2020
Total Game Count
Home
Visitor
Team Identity (Home or Visitor)
Legend
Home
Visitor

winning_team	year	count	winning_team	year	count
home	2000	101	visitor	2000	101
home	2001	94	visitor	2001	101
home	2002	115	visitor	2002	85
home	2003	108	visitor	2003	89
home	2004	115	visitor	2004	103
home	2005	97	visitor	2005	85
home	2006	105	visitor	2006	80
home	2007	117	visitor	2007	103
home	2008	108	visitor	2008	100
home	2009	106	visitor	2009	89
home	2010	116	visitor	2010	104
home	2011	133	visitor	2011	104
home	2012	96	visitor	2012	96
home	2013	125	visitor	2013	118
home	2014	112	visitor	2014	120
home	2015	111	visitor	2015	101
home	2016	93	visitor	2016	92
home	2017	96	visitor	2017	86
home	2018	117	visitor	2018	99
home	2019	99	visitor	2019	109
home	2020	32	visitor	2020	36

winning_team	year	count	winning_team	year	count
home	2000	1211	visitor	2000	1015
home	2001	1179	visitor	2001	1054
home	2002	1199	visitor	2002	1026
home	2003	1227	visitor	2003	1005
home	2004	1184	visitor	2004	1026
home	2005	1209	visitor	2005	1039
home	2006	1222	visitor	2006	1022
home	2007	1201	visitor	2007	1010
home	2008	1243	visitor	2008	977
home	2009	1227	visitor	2009	1008
home	2010	1242	visitor	2010	968
home	2011	1143	visitor	2011	1049
home	2012	1199	visitor	2012	1039
home	2013	1182	visitor	2013	1006
home	2014	1176	visitor	2014	1022
home	2015	1205	visitor	2015	1012
home	2016	1194	visitor	2016	1048
home	2017	1215	visitor	2017	1033
home	2018	1166	visitor	2018	1049
home	2019	1187	visitor	2019	1034
home	2020	462	visitor	2020	368

Runs scored $RUNS$ is equal to difference between the sum of runners $N_{runners}$ and outs O before (b) the event plus one and the number of runners $N_{runners}$ plus outs O after (a) after the event.

$$RUNS = (N_{runners}^{(b)} + O^{(b)} + 1) - (N_{runners}^{(a)} + o^{(a)})$$

```
## runs_simulation
```

```
##     0     1     2     3     4     5     6     7     8     9    10
## 14553  2869  1415   606   331   125    60    24    10     5     2
```

```
## [1] 0.27235
```

```
## [1] 0.50695
```

```
p3 <- df2020_pmatrix %*% df2020_pmatrix %*% df2020_pmatrix

p3 %>%
  as_tibble(rownames = "state") %>%
  filter(state == "010 0") %>%
  gather(key = "new_state", value = "prob", -state) %>%
  arrange(desc(prob)) %>%
  head()
```

```
## # A tibble: 6 x 3
##   state new_state   prob
##   <chr> <chr>      <dbl>
## 1 010 0 3         0.339
## 2 010 0 100 2     0.116
## 3 010 0 110 2     0.0832
## 4 010 0 101 2     0.0639
## 5 010 0 110 1     0.0603
## 6 010 0 010 2     0.0572
```