Basketball-Free-Throws

Pinak Nayak

```
# Basketball Free Throw ----

# Data ----

#Seasons
Seasons <-
c("2005","2006","2007","2008","2009","2010","2011","2012","2013","2014
")

#Players
Players <-
c("KobeBryant","JoeJohnson","LeBronJames","CarmeloAnthony","DwightHowa
rd","ChrisBosh","ChrisPaul","KevinDurant","DerrickRose","DwayneWade")


#Games
KobeBryant_G <- c(80,77,82,82,73,82,58,78,6,35)
JoeJohnson_G <- c(82,57,82,79,76,72,60,72,79,80)
LeBronJames_G <- c(79,78,75,81,76,79,62,76,77,69)
CarmeloAnthony_G <- c(80,65,77,66,69,77,55,67,77,40)
DwightHoward_G <- c(82,82,82,79,82,78,54,76,71,41)
ChrisBosh_G <- c(70,69,67,77,70,77,57,74,79,44)
ChrisPaul_G <- c(78,64,80,78,45,80,60,70,62,82)
KevinDurant_G <- c(35,35,80,74,82,78,66,81,81,27)
DerrickRose_G <- c(40,40,40,81,78,81,39,0,10,51)
DwayneWade_G <- c(75,51,51,79,77,76,49,69,54,62)
#Matrix
Games <- rbind(KobeBryant_G, JoeJohnson_G, LeBronJames_G,
CarmeloAnthony_G, DwightHoward_G, ChrisBosh_G, ChrisPaul_G,
KevinDurant_G, DerrickRose_G, DwayneWade_G)
rm(KobeBryant_G, JoeJohnson_G, CarmeloAnthony_G, DwightHoward_G,
ChrisBosh_G, LeBronJames_G, ChrisPaul_G, DerrickRose_G, DwayneWade_G,
KevinDurant_G)
colnames(Games) <- Seasons
rownames(Games) <- Players
```

```r
#Field Goals
KobeBryant_FG <- c(978,813,775,800,716,740,574,738,31,266)
JoeJohnson_FG <- c(632,536,647,620,635,514,423,445,462,446)
LeBronJames_FG <- c(875,772,794,789,768,758,621,765,767,624)
CarmeloAnthony_FG <- c(756,691,728,535,688,684,441,669,743,358)
DwightHoward_FG <- c(468,526,583,560,510,619,416,470,473,251)
ChrisBosh_FG <- c(549,543,507,615,600,524,393,485,492,343)
ChrisPaul_FG <- c(407,381,630,631,314,430,425,412,406,568)
KevinDurant_FG <- c(306,306,587,661,794,711,643,731,849,238)
DerrickRose_FG <- c(208,208,208,574,672,711,302,0,58,338)
DwayneWade_FG <- c(699,472,439,854,719,692,416,569,415,509)
#Matrix
FieldGoals <- rbind(KobeBryant_FG, JoeJohnson_FG, LeBronJames_FG,
CarmeloAnthony_FG, DwightHoward_FG, ChrisBosh_FG, ChrisPaul_FG,
KevinDurant_FG, DerrickRose_FG, DwayneWade_FG)
rm(KobeBryant_FG, JoeJohnson_FG, LeBronJames_FG, CarmeloAnthony_FG,
DwightHoward_FG, ChrisBosh_FG, ChrisPaul_FG, KevinDurant_FG,
DerrickRose_FG, DwayneWade_FG)
colnames(FieldGoals) <- Seasons
rownames(FieldGoals) <- Players

#Field Goal Attempts
KobeBryant_FGA <- c(2173,1757,1690,1712,1569,1639,1336,1595,73,713)
JoeJohnson_FGA <- c(1395,1139,1497,1420,1386,1161,931,1052,1018,1025)
LeBronJames_FGA <-
c(1823,1621,1642,1613,1528,1485,1169,1354,1353,1279)
CarmeloAnthony_FGA <-
c(1572,1453,1481,1207,1502,1503,1025,1489,1643,806)
DwightHoward_FGA <- c(881,873,974,979,834,1044,726,813,800,423)
ChrisBosh_FGA <- c(1087,1094,1027,1263,1158,1056,807,907,953,745)
ChrisPaul_FGA <- c(947,871,1291,1255,637,928,890,856,870,1170)
KevinDurant_FGA <- c(647,647,1366,1390,1668,1538,1297,1433,1688,467)
DerrickRose_FGA <- c(436,436,436,1208,1373,1597,695,0,164,835)
DwayneWade_FGA <- c(1413,962,937,1739,1511,1384,837,1093,761,1084)
#Matrix
FieldGoalAttempts <- rbind(KobeBryant_FGA, JoeJohnson_FGA,
LeBronJames_FGA, CarmeloAnthony_FGA, DwightHoward_FGA, ChrisBosh_FGA,
ChrisPaul_FGA, KevinDurant_FGA, DerrickRose_FGA, DwayneWade_FGA)
rm(KobeBryant_FGA, JoeJohnson_FGA, LeBronJames_FGA,
CarmeloAnthony_FGA, DwightHoward_FGA, ChrisBosh_FGA, ChrisPaul_FGA,
```

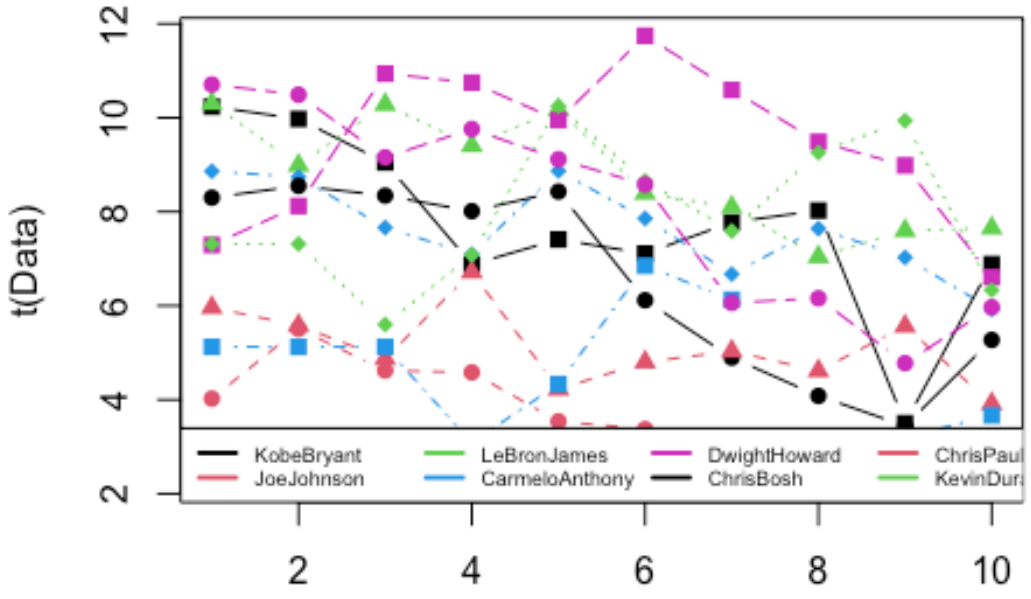
```
KevinDurant_FGA, DerrickRose_FGA, DwayneWade_FGA)
colnames(FieldGoalAttempts) <- Seasons
rownames(FieldGoalAttempts) <- Players

#Points
KobeBryant_PTS <- c(2832,2430,2323,2201,1970,2078,1616,2133,83,782)
JoeJohnson_PTS <- c(1653,1426,1779,1688,1619,1312,1129,1170,1245,1154)
LeBronJames_PTS <-
c(2478,2132,2250,2304,2258,2111,1683,2036,2089,1743)
CarmeloAnthony_PTS <-
c(2122,1881,1978,1504,1943,1970,1245,1920,2112,966)
DwightHoward_PTS <-
c(1292,1443,1695,1624,1503,1784,1113,1296,1297,646)
ChrisBosh_PTS <- c(1572,1561,1496,1746,1678,1438,1025,1232,1281,928)
ChrisPaul_PTS <- c(1258,1104,1684,1781,841,1268,1189,1186,1185,1564)
KevinDurant_PTS <- c(903,903,1624,1871,2472,2161,1850,2280,2593,686)
DerrickRose_PTS <- c(597,597,597,1361,1619,2026,852,0,159,904)
DwayneWade_PTS <- c(2040,1397,1254,2386,2045,1941,1082,1463,1028,1331)
#Matrix
Points <- rbind(KobeBryant_PTS, JoeJohnson_PTS, LeBronJames_PTS,
CarmeloAnthony_PTS, DwightHoward_PTS, ChrisBosh_PTS, ChrisPaul_PTS,
KevinDurant_PTS, DerrickRose_PTS, DwayneWade_PTS)
rm(KobeBryant_PTS, JoeJohnson_PTS, LeBronJames_PTS,
CarmeloAnthony_PTS, DwightHoward_PTS, ChrisBosh_PTS, ChrisPaul_PTS,
KevinDurant_PTS, DerrickRose_PTS, DwayneWade_PTS)
colnames(Points) <- Seasons
rownames(Points) <- Players


#Free Throws
KobeBryant_FT <- c(696,667,623,483,439,483,381,525,18,196)
JoeJohnson_FT <- c(261,235,316,299,220,195,158,132,159,141)
LeBronJames_FT <- c(601,489,549,594,593,503,387,403,439,375)
CarmeloAnthony_FT <- c(573,459,464,371,508,507,295,425,459,189)
DwightHoward_FT <- c(356,390,529,504,483,546,281,355,349,143)
ChrisBosh_FT <- c(474,463,472,504,470,384,229,241,223,179)
ChrisPaul_FT <- c(394,292,332,455,161,337,260,286,295,289)
KevinDurant_FT <- c(209,209,391,452,756,594,431,679,703,146)
DerrickRose_FT <- c(146,146,146,197,259,476,194,0,27,152)
DwayneWade_FT <- c(629,432,354,590,534,494,235,308,189,284)
```

```
#Matrix
FreeThrows <- rbind(KobeBryant_FT, JoeJohnson_FT, LeBronJames_FT,
CarmeloAnthony_FT, DwightHoward_FT,
                    ChrisBosh_FT, ChrisPaul_FT, KevinDurant_FT,
DerrickRose_FT, DwayneWade_FT)
colnames(FreeThrows) <- Seasons
rownames(FreeThrows) <- Players

print(FreeThrows)
```

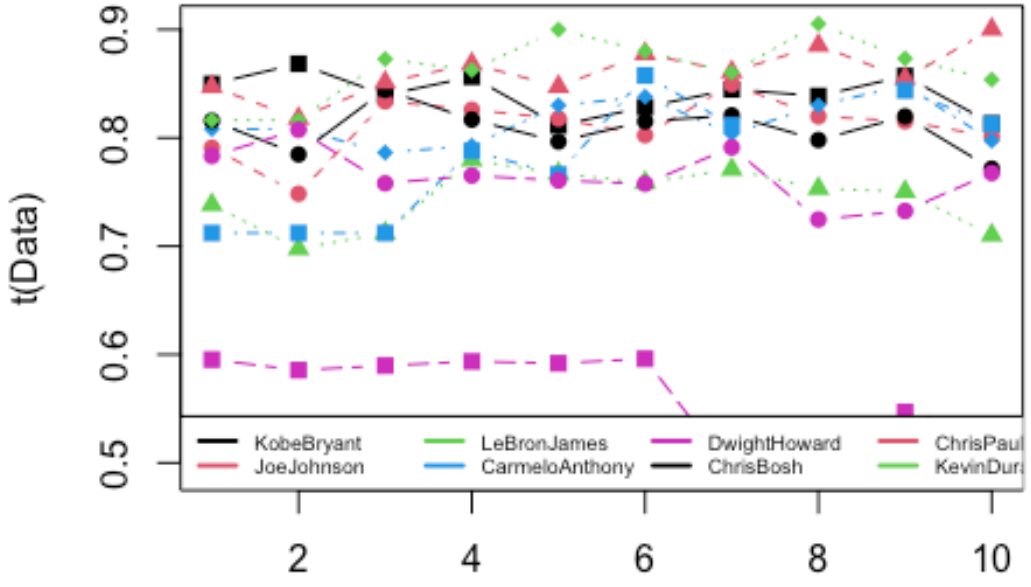
```
##                 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014
## KobeBryant       696  667  623  483  439  483  381  525   18  196
## JoeJohnson       261  235  316  299  220  195  158  132  159  141
## LeBronJames      601  489  549  594  593  503  387  403  439  375
## CarmeloAnthony   573  459  464  371  508  507  295  425  459  189
## DwightHoward     356  390  529  504  483  546  281  355  349  143
## ChrisBosh        474  463  472  504  470  384  229  241  223  179
## ChrisPaul        394  292  332  455  161  337  260  286  295  289
## KevinDurant      209  209  391  452  756  594  431  679  703  146
## DerrickRose      146  146  146  197  259  476  194    0   27  152
## DwayneWade       629  432  354  590  534  494  235  308  189  284
```

```
#Free Throw Attempts
KobeBryant_FTA <- c(819,768,742,564,541,583,451,626,21,241)
JoeJohnson_FTA <- c(330,314,379,362,269,243,186,161,195,176)
LeBronJames_FTA <- c(814,701,771,762,773,663,502,535,585,528)
CarmeloAnthony_FTA <- c(709,568,590,468,612,605,367,512,541,237)
DwightHoward_FTA <- c(598,666,897,849,816,916,572,721,638,271)
ChrisBosh_FTA <- c(581,590,559,617,590,471,279,302,272,232)
ChrisPaul_FTA <- c(465,357,390,524,190,384,302,323,345,321)
KevinDurant_FTA <- c(256,256,448,524,840,675,501,750,805,171)
DerrickRose_FTA <- c(205,205,205,250,338,555,239,0,32,187)
DwayneWade_FTA <- c(803,535,467,771,702,652,297,425,258,370)
#Matrix
FreeThrowAttempts <- rbind(KobeBryant_FTA, JoeJohnson_FTA,
LeBronJames_FTA, CarmeloAnthony_FTA, DwightHoward_FTA,
                    ChrisBosh_FTA, ChrisPaul_FTA, KevinDurant_FTA,
DerrickRose_FTA, DwayneWade_FTA)
colnames(FreeThrowAttempts) <- Seasons
rownames(FreeThrowAttempts) <- Players
```

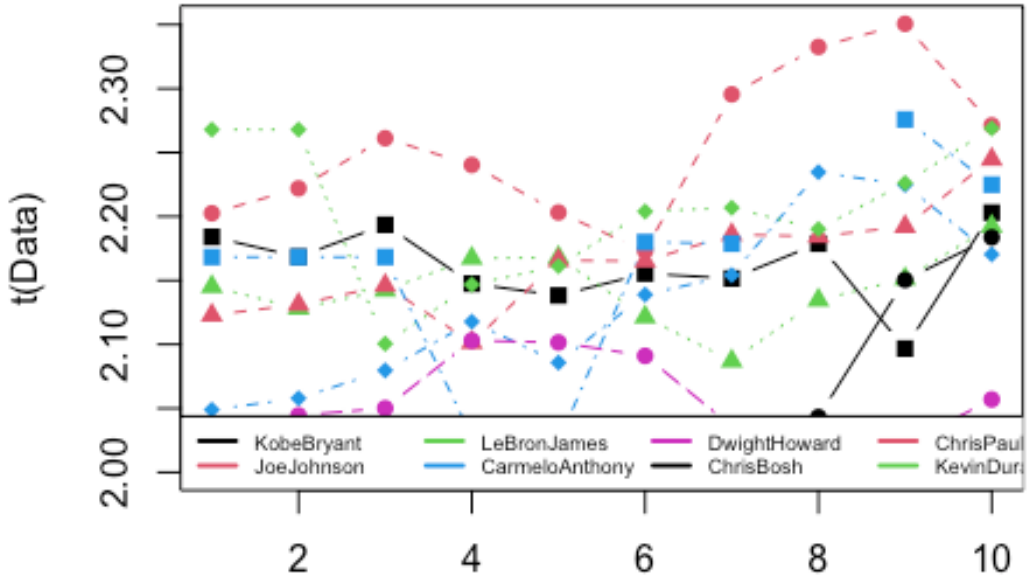
```r
### Assignment ----

#You need to create three plots that potray the following insights:
# 1) Free throw attempts per game
# 2) Accuracy of Free Throws
# 3) Player playing style (2 vs 3 point preference) excluding free
throws


# Create a function to plot quickly ----
myplot <- function(data, rows = 1:10){
  Data <- data[rows,,drop=F]
  matplot(t(Data), type="b", pch=15:18, col=c(1:4,6))
  #legend("bottomleft", inset=0.01,
legend=Players[rows],col=c(1:4,6),pch=15:18, horiz=F)
  legend("bottomleft",  inset = c(0,0) , cex = 0.55, col = c(1:4,6),
         lty = 1, lwd = 2, ncol = 5, legend = Players)
}


# 1) Free throw attempts per game ----

myplot(FreeThrowAttempts/Games)
```




```
# 2) Accuracy of Free Throws ----

myplot(FreeThrows/FreeThrowAttempts)
```




```
# 3) Player playing style (2 vs 3 point preference) excluding free throws ----

# calculate ratio of points:fieldgoals. Have to subtract free throws first

Points.No.FreeThrows <- Points - FreeThrows


myplot(Points.No.FreeThrows/FieldGoals)
```


t(Data)
2.00
2.10
2.20
2.30
2
4
6
8
10
KobeBryant
JoeJohnson
LeBronJames
CarmeloAnthony
DwightHoward
ChrisBosh
ChrisPaul
KevinDur