

Basketball Free Throws

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```
# Basketball Free Throw ----
```

```
# Data ----
```

```
#Seasons
```

```
Seasons <-
```

```
c("2005", "2006", "2007", "2008", "2009", "2010", "2011", "2012", "2013", "2014")
```

```
#Players
```

```
Players <-
```

```
c("KobeBryant", "JoeJohnson", "LeBronJames", "CarmeloAnthony", "DwightHoward", "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
```

#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
```

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

```
#You need to create three plots that portray the following insights:
```

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

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

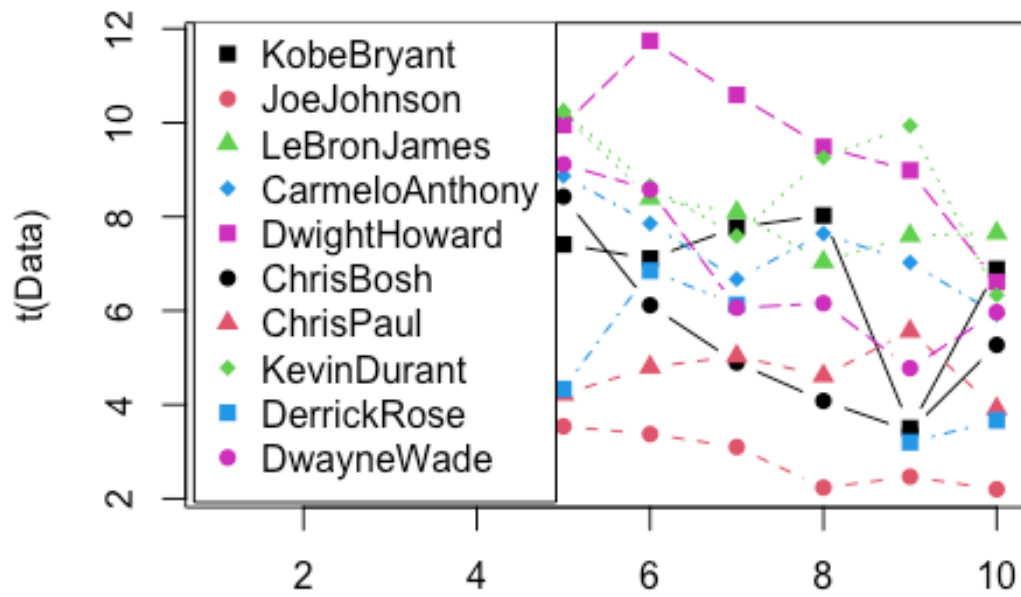
```
# 3) Player playing style (2 vs 3 point preference) excluding free  
throws
```

```
# 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)  
}
```

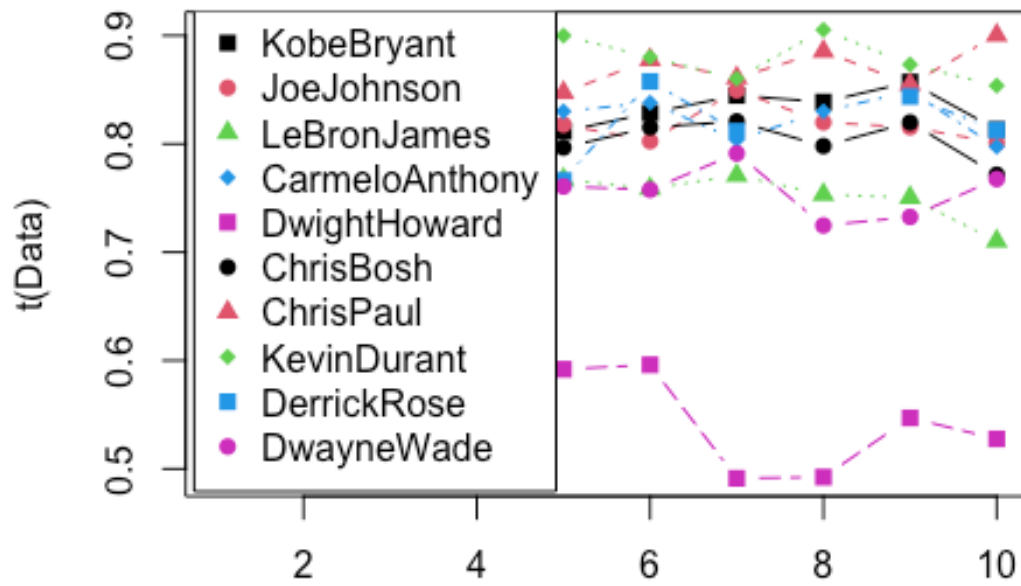
```
# 1) Free throw attempts per game ----
```

```
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)
```

