



EDUCACIÓN
SECRETARÍA DE EDUCACIÓN PÚBLICA



**Tecnológico Nacional de México
Instituto Tecnológico Campus Tijuana
Ing. en Sistemas Computacionales**

Subdirección académica
Departamento de sistemas y computación

Asignatura:
Minería de datos

Semestre
agosto - diciembre

Práctica 4

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Free Throws

You have been supplied data for two additional in-game stats:

- Free Throws
- Free Throws Attempt

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

- Free Throw Attempts per game
- Accuracy of Free Throws
- Player playing style (2 vs 3 points preference) excluding Free Throws

Each Free Throw is worth 1 Point

The data has been supplied in the form of vectors. You will have to Create the matrices before you proceed with the analysis.

```
#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
```



```
print("Games")
Games

#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
print("Points")
Points
#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
paste("FieldGoals")
FieldGoals
#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)
rm(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")
FreeThrows

#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)
FreeThrowAttempts <- rbind(KobeBryant_FTA, JoeJohnson_FTA,
LeBronJames_FTA, CarmeloAnthony_FTA, DwightHoward_FTA, ChrisBosh_FTA,
ChrisPaul_FTA, KevinDurant_FTA, DerrickRose_FTA, DwayneWade_FTA)
rm(KobeBryant_FTA, JoeJohnson_FTA, LeBronJames_FTA, CarmeloAnthony_FTA,
DwightHoward_FTA, ChrisBosh_FTA, ChrisPaul_FTA, KevinDurant_FTA,
DerrickRose_FTA, DwayneWade_FTA)
```



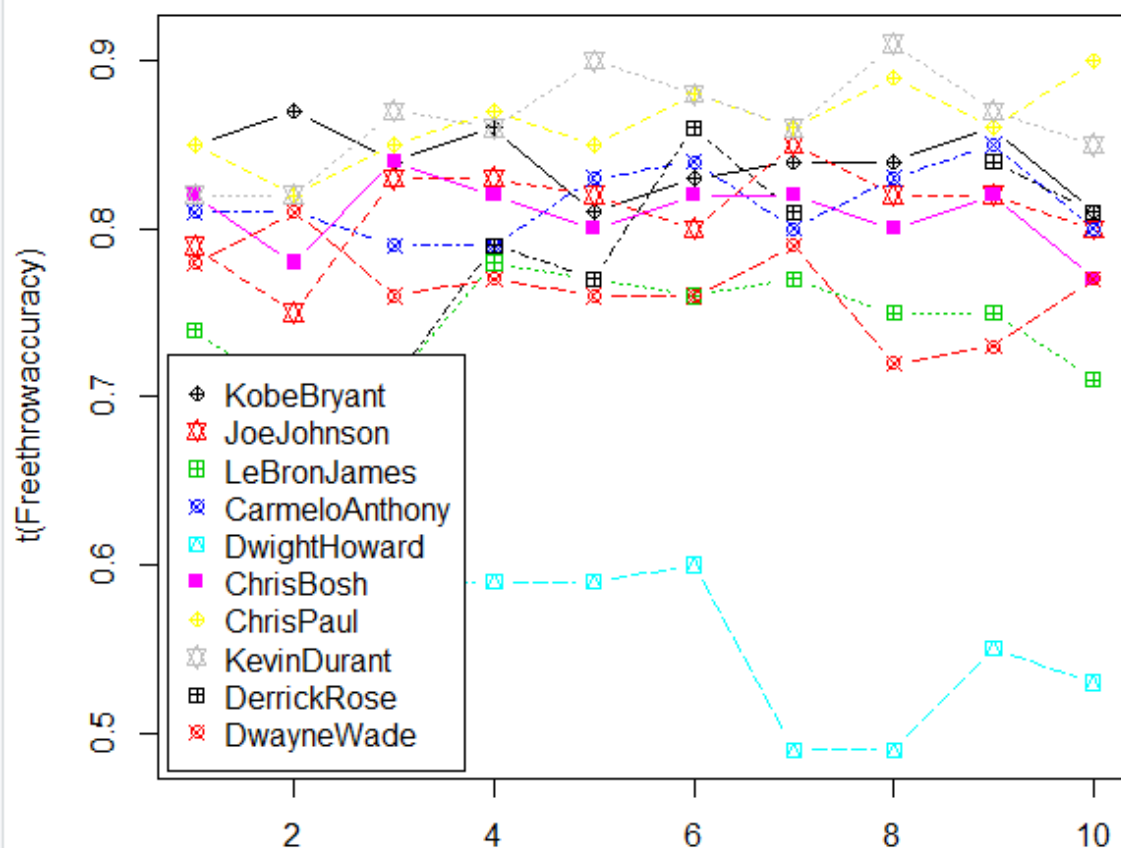
```
colnames(FreeThrowAttempts) <- Seasons
rownames(FreeThrowAttempts) <- Players
print("FreeThrowAttempts")
FreeThrowAttempts

Freethrowaccuracy<-((FreeThrows/FreeThrowAttempts))
print("FreeThrowAccuracy")
Freethrowaccuracy<-round(Freethrowaccuracy,2)
Freethrowaccuracy
matplot(t(Freethrowaccuracy),type="b",pch=(10:15),col=c(1:10,2))
legend("bottomleft",inset=0.01,legend=Players,col=c(1:10,2),pch=(10:15),
horiz=F)

print("FreeThrowAttemptsPerGame")
FTAPGame<-round((FreeThrowAttempts/Games),2)
FTAPGame
matplot(t(FTAPGame),type="b",pch=(10:15),col=c(1:10,2))
legend("bottomleft",inset=0.01,legend=Players,col=c(1:10,2),pch=(10:15),
horiz=F)

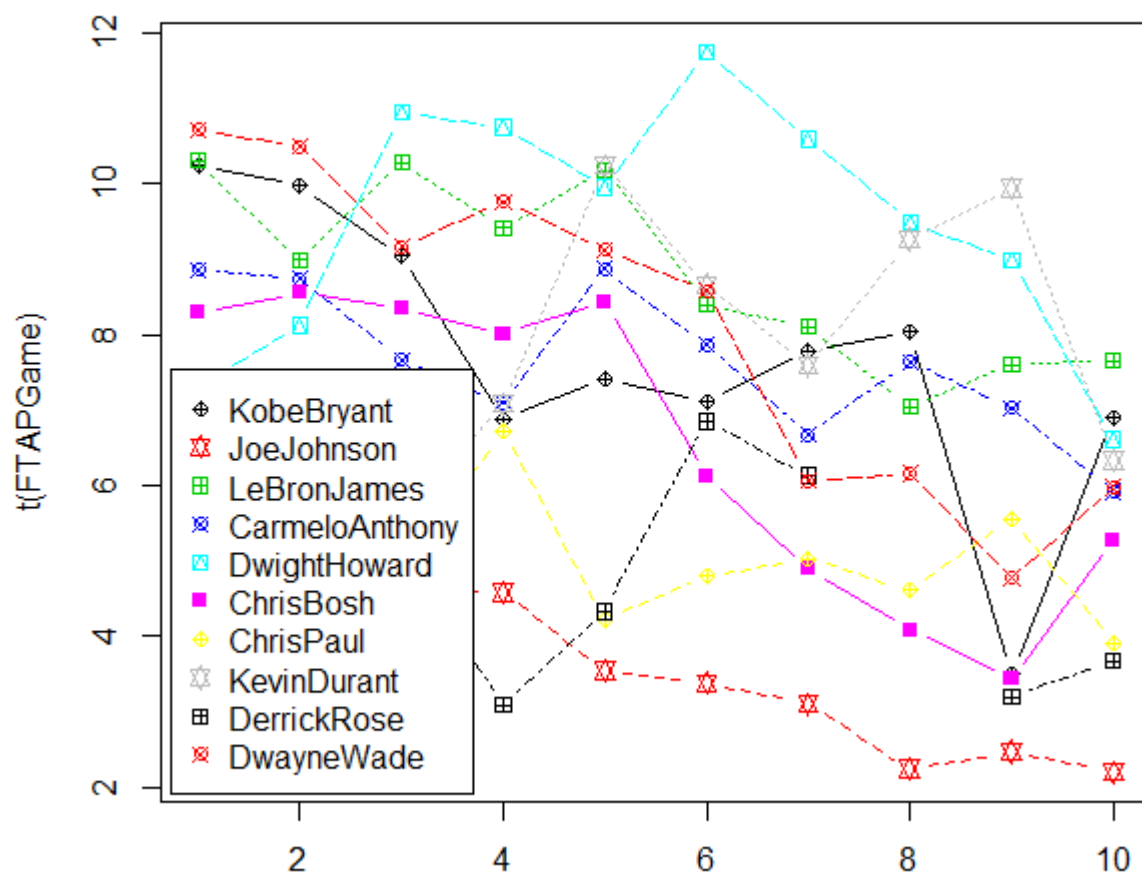
print("Points without free throws")
PWFT<-(Points-FreeThrows)/FieldGoals
PWFT
print("2 Pointers per Game")
Ptg2<-round((PWFT/2),2)
Ptg2
print("3 Pointers per Game")
Ptg3<-round((PWFT/3),2)
Ptg3
matplot(t(Ptg2),type="b",pch=(10:15),col=c(1:10,2))
legend("bottomleft",inset=0.01,legend=Players,col=c(1:10,2),pch=(10:15),
horiz=F)

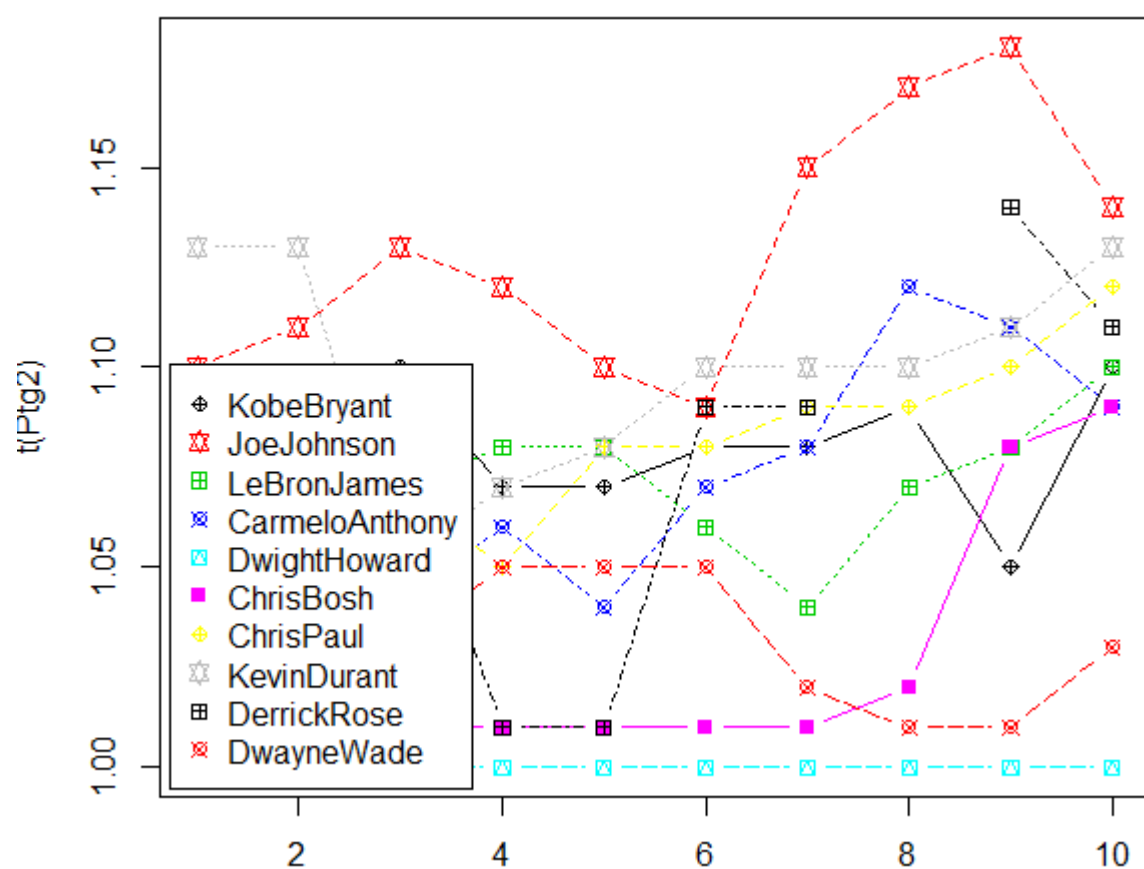
matplot(t(Ptg3),type="b",pch=(10:15),col=c(1:10,2))
legend("bottomleft",inset=0.01,legend=Players,col=c(1:10,2),pch=(10:15),
horiz=F)
```



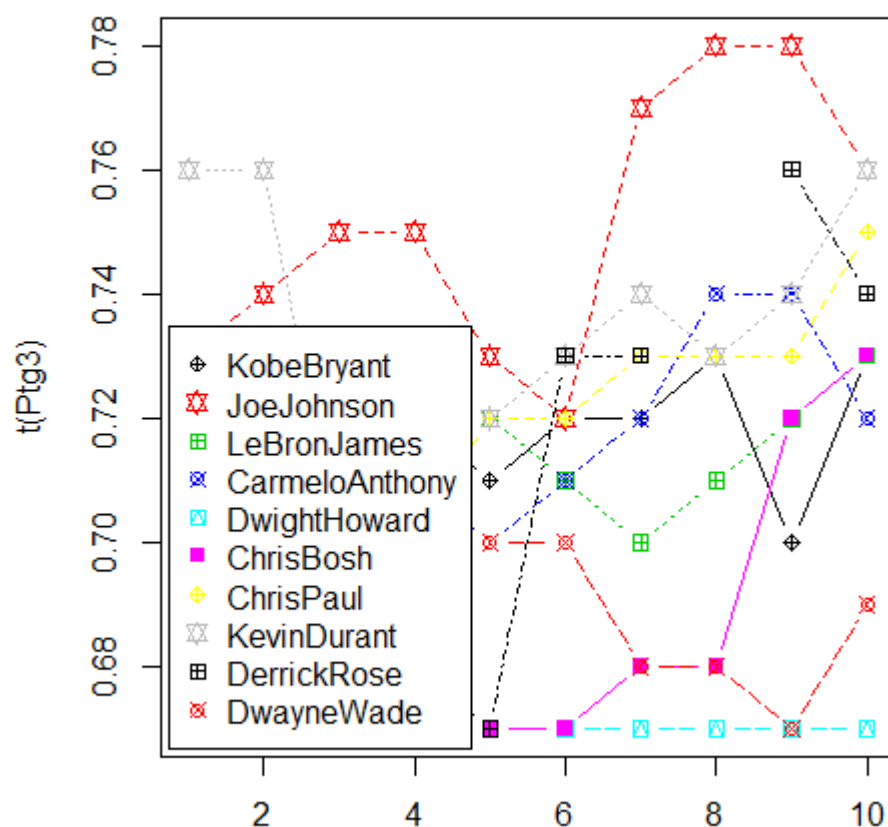
En esta gráfica podemos observar que la puntería en tiros libres es encabezada por Kevin Durant sin embargo Chris Paul muestra un rendimiento constante y en crecimiento. Por otro lado Dwight Howard es quien peor puntería tiene en tiros libres

En esta gráfica se pueden observar los intentos de tiros libres por juego de cada uno de los jugadores destacados del momento en la cual destaca Kobe Bryant aunque todos presentan unos altos porcentajes de intentos si se les compara con otros jugadores.





En la gráfica podemos observar que Joe Johnson es un jugador con un buen registro en anotaciones de dos puntos.



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