  

TIJUANA INSTITUTE OF TECHNOLOGY

## ACADEMIC

DEPARTMENT SYSTEMS AND COMPUTING DEPARTMENT COMPUTER SYSTEMS ENGINEERING

SEMESTER FEBRUARY- JULY 2022

## SUBJECT

BDD-1703SC9C Data Mining

Activity

#4

# Professor

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Free Throws

You have been supplide data for two additiona in-game statics:

\* Free Throws

* Free Throws Attempt

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

\* Free Trows Attempts per game

* Accurance of Free Trhows
* 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","Chris Paul","KevinDurant","DerrickRose","DwayneWade")

#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 #

# <put your code here>

FThrows <- 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(FThrows) <- Seasons rownames(FThrows) <- Players FThrows

#

#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 #

# <put your code here>

FTattempts<-rbind(KobeBryant\_FTA, JoeJohnson\_FTA,LeBronJames\_FTA,CarmeloAnthony\_FTA,DwightHoward\_FTA,ChrisBosh\_FTA,C hrisPaul\_FTA,KevinDurant\_FTA,DerrickRose\_FTA,DwayneWade\_FTA)

rm(KobeBryant\_FTA, JoeJohnson\_FTA,LeBronJames\_FTA,CarmeloAnthony\_FTA,DwightHoward\_FTA,ChrisBosh\_FTA,C hrisPaul\_FTA,KevinDurant\_FTA,DerrickRose\_FTA,DwayneWade\_FTA)

colnames(FTattempts) <- Seasons rownames(FTattempts) <- Players FTattempts

#

myanalysis <- function(z, who=1:10) {

matplot(t(z[who,,drop=F]), type="b", pch=15:18, col=c(1:4,6), main="Basketball Players Analysis") legend("bottomleft", inset=0.01, legend=Players[who], col=c(1:4,6), pch=15:18, horiz=F)

}

myanalysis(FThrows) myanalysis(FTattempts) #matriz de juegos

KobeBryant\_Game <- c(69,66,62,48,53,68,78,42,58,79) JoeJohnson\_Game <- c(46,73,61,29,42,19,55,43,35,74) LeBronJames\_Game <- c(26,48,45,59,69,50,58,40,39,75)

CarmeloAnthony\_Game <- c(57,45,46,37,50,50,29,42,45,18) DwightHoward\_Game <- c(35,39,52,50,48,54,28,35,34,14) ChrisBosh\_Game <- c(47,46,47,50,47,38,22,24,22,17) ChrisPaul\_Game <- c(39,49,33,45,56,33,26,68,29,28) KevinDurant\_Game <- c(20,20,31,45,75,59,43,67,70,14) DerrickRose\_Game <- c(14,46,46,17,59,47,19,0,27,25) DwayneWade\_Game <- c(62,43,35,59,54,49,23,30,18,28)

#games matrix Games<-

rbind(KobeBryant\_Game,JoeJohnson\_Game,LeBronJames\_Game,CarmeloAnthony\_Game,DwightH oward\_Game,ChrisBosh\_Game,ChrisPaul\_Game,KevinDurant\_Game,DerrickRose\_Game,Dwayne Wade\_Game) rm(KobeBryant\_Game,JoeJohnson\_Game,LeBronJames\_Game,CarmeloAnthony\_Game,DwightHo ward\_Game,ChrisBosh\_Game,ChrisPaul\_Game,KevinDurant\_Game,DerrickRose\_Game,DwayneW ade\_Game)

colnames(Games) <- Seasons rownames(Games) <- Players Games

#part 1

myanalysis(FTattempts/Games) # Graphic demonstration of the attempts of each player #especially watching Chris paul who have few shot attempts

#part 2

# Field Annotations array

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)

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

myanalysis(FThrows/FTattempts) # Here the precision that chris paul has is demonstrated #but that dwight howard has the worst free throw accuracy

#FieldGoalAttempts

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

myanalysis(FieldGoals/FieldGoalAttempts) # Here it is graphically demonstrated Dwight has more annotations than free throws

#Player scores data is created #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

myanalysis ((Points-FThrows)/FieldGoals)# It is to see the change in styles of play # the difference between free throws and field goals # It is observed in the graph that one of the players never changes is dwight since # never takes free throws but always makes field goals so it doesn't change # And the player with the most change in the season is Joe since his annotations have changed # to score 2 to 3 point.



