Matrix Operations & Vizualizing with Matplot

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#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")  
  
#Salaries  
KobeBryant\_Salary <- c(15946875,17718750,19490625,21262500,23034375,24806250,25244493,27849149,30453805,23500000)  
JoeJohnson\_Salary <- c(12000000,12744189,13488377,14232567,14976754,16324500,18038573,19752645,21466718,23180790)  
LeBronJames\_Salary <- c(4621800,5828090,13041250,14410581,15779912,14500000,16022500,17545000,19067500,20644400)  
CarmeloAnthony\_Salary <- c(3713640,4694041,13041250,14410581,15779912,17149243,18518574,19450000,22407474,22458000)  
DwightHoward\_Salary <- c(4493160,4806720,6061274,13758000,15202590,16647180,18091770,19536360,20513178,21436271)  
ChrisBosh\_Salary <- c(3348000,4235220,12455000,14410581,15779912,14500000,16022500,17545000,19067500,20644400)  
ChrisPaul\_Salary <- c(3144240,3380160,3615960,4574189,13520500,14940153,16359805,17779458,18668431,20068563)  
KevinDurant\_Salary <- c(0,0,4171200,4484040,4796880,6053663,15506632,16669630,17832627,18995624)  
DerrickRose\_Salary <- c(0,0,0,4822800,5184480,5546160,6993708,16402500,17632688,18862875)  
DwayneWade\_Salary <- c(3031920,3841443,13041250,14410581,15779912,14200000,15691000,17182000,18673000,15000000)  
#Matrix  
Salary <- rbind(KobeBryant\_Salary, JoeJohnson\_Salary, LeBronJames\_Salary, CarmeloAnthony\_Salary, DwightHoward\_Salary, ChrisBosh\_Salary, ChrisPaul\_Salary, KevinDurant\_Salary, DerrickRose\_Salary, DwayneWade\_Salary)  
rm(KobeBryant\_Salary, JoeJohnson\_Salary, CarmeloAnthony\_Salary, DwightHoward\_Salary, ChrisBosh\_Salary, LeBronJames\_Salary, ChrisPaul\_Salary, DerrickRose\_Salary, DwayneWade\_Salary, KevinDurant\_Salary)  
colnames(Salary) <- Seasons  
rownames(Salary) <- Players  
  
#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  
  
#Minutes Played  
KobeBryant\_MP <- c(3277,3140,3192,2960,2835,2779,2232,3013,177,1207)  
JoeJohnson\_MP <- c(3340,2359,3343,3124,2886,2554,2127,2642,2575,2791)  
LeBronJames\_MP <- c(3361,3190,3027,3054,2966,3063,2326,2877,2902,2493)  
CarmeloAnthony\_MP <- c(2941,2486,2806,2277,2634,2751,1876,2482,2982,1428)  
DwightHoward\_MP <- c(3021,3023,3088,2821,2843,2935,2070,2722,2396,1223)  
ChrisBosh\_MP <- c(2751,2658,2425,2928,2526,2795,2007,2454,2531,1556)  
ChrisPaul\_MP <- c(2808,2353,3006,3002,1712,2880,2181,2335,2171,2857)  
KevinDurant\_MP <- c(1255,1255,2768,2885,3239,3038,2546,3119,3122,913)  
DerrickRose\_MP <- c(1168,1168,1168,3000,2871,3026,1375,0,311,1530)  
DwayneWade\_MP <- c(2892,1931,1954,3048,2792,2823,1625,2391,1775,1971)  
#Matrix  
MinutesPlayed <- rbind(KobeBryant\_MP, JoeJohnson\_MP, LeBronJames\_MP, CarmeloAnthony\_MP, DwightHoward\_MP, ChrisBosh\_MP, ChrisPaul\_MP, KevinDurant\_MP, DerrickRose\_MP, DwayneWade\_MP)  
rm(KobeBryant\_MP, JoeJohnson\_MP, CarmeloAnthony\_MP, DwightHoward\_MP, ChrisBosh\_MP, LeBronJames\_MP, ChrisPaul\_MP, DerrickRose\_MP, DwayneWade\_MP, KevinDurant\_MP)  
colnames(MinutesPlayed) <- Seasons  
rownames(MinutesPlayed) <- 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  
  
  
# Matrix Operations ----  
  
FieldGoals

## 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014  
## KobeBryant 978 813 775 800 716 740 574 738 31 266  
## JoeJohnson 632 536 647 620 635 514 423 445 462 446  
## LeBronJames 875 772 794 789 768 758 621 765 767 624  
## CarmeloAnthony 756 691 728 535 688 684 441 669 743 358  
## DwightHoward 468 526 583 560 510 619 416 470 473 251  
## ChrisBosh 549 543 507 615 600 524 393 485 492 343  
## ChrisPaul 407 381 630 631 314 430 425 412 406 568  
## KevinDurant 306 306 587 661 794 711 643 731 849 238  
## DerrickRose 208 208 208 574 672 711 302 0 58 338  
## DwayneWade 699 472 439 854 719 692 416 569 415 509

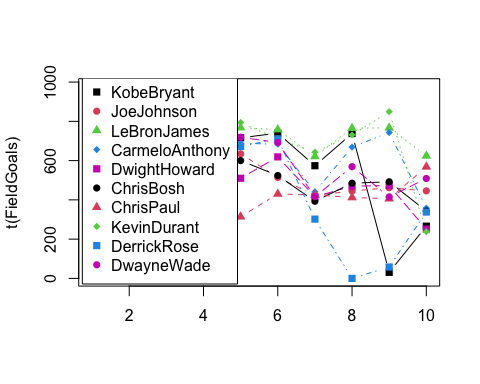
round(FieldGoals/Games, 1)

## 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014  
## KobeBryant 12.2 10.6 9.5 9.8 9.8 9.0 9.9 9.5 5.2 7.6  
## JoeJohnson 7.7 9.4 7.9 7.8 8.4 7.1 7.0 6.2 5.8 5.6  
## LeBronJames 11.1 9.9 10.6 9.7 10.1 9.6 10.0 10.1 10.0 9.0  
## CarmeloAnthony 9.4 10.6 9.5 8.1 10.0 8.9 8.0 10.0 9.6 8.9  
## DwightHoward 5.7 6.4 7.1 7.1 6.2 7.9 7.7 6.2 6.7 6.1  
## ChrisBosh 7.8 7.9 7.6 8.0 8.6 6.8 6.9 6.6 6.2 7.8  
## ChrisPaul 5.2 6.0 7.9 8.1 7.0 5.4 7.1 5.9 6.5 6.9  
## KevinDurant 8.7 8.7 7.3 8.9 9.7 9.1 9.7 9.0 10.5 8.8  
## DerrickRose 5.2 5.2 5.2 7.1 8.6 8.8 7.7 NaN 5.8 6.6  
## DwayneWade 9.3 9.3 8.6 10.8 9.3 9.1 8.5 8.2 7.7 8.2

round(MinutesPlayed/Games)

## 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014  
## KobeBryant 41 41 39 36 39 34 38 39 30 34  
## JoeJohnson 41 41 41 40 38 35 35 37 33 35  
## LeBronJames 43 41 40 38 39 39 38 38 38 36  
## CarmeloAnthony 37 38 36 34 38 36 34 37 39 36  
## DwightHoward 37 37 38 36 35 38 38 36 34 30  
## ChrisBosh 39 39 36 38 36 36 35 33 32 35  
## ChrisPaul 36 37 38 38 38 36 36 33 35 35  
## KevinDurant 36 36 35 39 40 39 39 39 39 34  
## DerrickRose 29 29 29 37 37 37 35 NaN 31 30  
## DwayneWade 39 38 38 39 36 37 33 35 33 32

# Vizualizing with Matplot()----  
  
matplot(t(FieldGoals), type="b", pch=15:18, col=c(1:4,6))  
legend("bottomleft", inset=0.01, legend=Players,col=c(1:4,6),pch=15:18, horiz=F)



matplot(t(FieldGoals/FieldGoalAttempts), type="b", pch=15:18, col=c(1:4,6))  
legend("bottomleft", inset=0.01, legend=Players,col=c(1:4,6),pch=15:18, horiz=F)

