**Assignment 2.3/Shalini Raghaviah**

Create an m x n matrix with replicate(m, rnorm(n)) with m=10 column vectors of n=10 elements each,

constructed with rnorm(n), which creates random normal numbers.

Then we transform it into a dataframe (thus 10 observations of 10 variables) and perform an algebraic

operation on each element using a nested for loop: at each iteration, every element referred by the two

indexes is incremented by a sinusoidal function, compare the vectorized and non-vectorized form of creating the solution and report the system time differences.

x<-replicate(10,rnorm(10))

data\_frame<-as.data.frame(x)

print(x)

summary(x)

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| [,1] [,2] [,3] [,4] [,5] [,6] [,7]  [1,] -0.1523334 -0.05831615 0.5674393 0.83743962 1.135139469 0.01669325 -1.1424695  [2,] 2.0461807 -0.88415892 -1.1553921 -0.43505041 1.599208221 -1.12779936 -0.2524367  [3,] -0.2179385 1.35340772 0.9718515 1.67390622 -1.143746028 -0.73295334 0.5774311  [4,] 1.2143805 1.99228904 -1.6299545 -1.98484509 -0.530597712 0.23860058 1.2825800  [5,] -0.2590926 -0.54995380 -0.1257438 -0.01053627 0.295237351 2.25089594 -0.7115214  [6,] 0.8457180 1.34987645 -1.2510716 1.36824847 2.354444975 -1.81742365 2.2776484  [7,] 0.1760714 -1.04229674 -0.4488422 -0.94688613 -1.604528402 0.61426183 0.3801301  [8,] 2.8324500 0.79911964 -0.9075701 -0.44800771 -1.875667546 -0.76613812 -0.4759448  [9,] -0.6723664 -1.56626233 0.3386909 1.22628942 -0.008152533 0.30416854 0.4369323  [10,] 0.1190194 -0.30157549 0.7485901 -1.09854813 0.038658734 -1.19835936 -2.7640177  [,8] [,9] [,10]  [1,] 0.9315961 -0.04522117 1.09007055  [2,] 0.9178854 1.53093703 -1.08768052  [3,] 1.1092192 0.76065495 0.21521130  [4,] 0.3290196 0.28478479 0.03752955  [5,] 0.9889164 0.79578296 1.40802036  [6,] 0.5789194 0.50189790 -0.68645398  [7,] -0.8314450 0.66215817 1.29379506  [8,] 1.0953817 0.15252179 -1.01187886  [9,] 0.5556923 -0.32537337 -0.41473890  [10,] 0.4648429 0.61498576 -1.07371385  > summary(x)  V1 V2 V3 V4 V5  Min. :-0.6724 Min. :-1.5663 Min. :-1.6300 Min. :-1.9848 Min. :-1.87567  1st Qu.:-0.2015 1st Qu.:-0.8006 1st Qu.:-1.0934 1st Qu.:-0.8222 1st Qu.:-0.99046  Median : 0.1475 Median :-0.1799 Median :-0.2873 Median :-0.2228 Median : 0.01525  Mean : 0.5932 Mean : 0.1092 Mean :-0.2892 Mean : 0.0182 Mean : 0.02600  3rd Qu.: 1.1222 3rd Qu.: 1.2122 3rd Qu.: 0.5103 3rd Qu.: 1.1291 3rd Qu.: 0.92516  Max. : 2.8325 Max. : 1.9923 Max. : 0.9719 Max. : 1.6739 Max. : 2.35445  V6 V7 V8 V9 V10  Min. :-1.8174 Min. :-2.76402 Min. :-0.8314 Min. :-0.3254 Min. :-1.08768  1st Qu.:-1.0374 1st Qu.:-0.65263 1st Qu.: 0.4876 1st Qu.: 0.1856 1st Qu.:-0.93052  Median :-0.3581 Median : 0.06385 Median : 0.7484 Median : 0.5584 Median :-0.18860  Mean :-0.2218 Mean :-0.03917 Mean : 0.6140 Mean : 0.4933 Mean :-0.02298  3rd Qu.: 0.2878 3rd Qu.: 0.54231 3rd Qu.: 0.9746 3rd Qu.: 0.7360 3rd Qu.: 0.87136  Max. : 2.2509 Max. : 2.27765 Max. : 1.1092 Max. : 1.5309 Max. : 1.40802 |
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