SESSION 3: FOUNDATIONAL

R PROGRAMMING

Assignment 2

1.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.

```
#Vectorizedform
                set.seed(32)

                #create matrix
                mat_1<- replicate(10,rnorm(10))

                #transform into data frame
                df_1= data.frame(mat_1)
                df_1<- df_1 + 10*sin(0.75*pi)

                #non-vectorized form
                set.seed(32)
                #create matrix
                mat_1<- replicate(10,rnorm(10))
                #transform into data frame
                df_1= data.frame(mat_1)

                for(i in 1:10){
```

```r
  for(j in 1:10){
    df_1[i,j]<- df_1[i,j] + 10*sin(0.75*pi)
    print(df_1)
    }
}

#time difference

system.time(
      df_1[i,j]<- df_1[i,j] +
10*sin(0.75*pi)
)

system.time(
  for(i in 1:10){
  for(j in 1:10){
    df_1[i,j]<- df_1[i,j] + 10*sin(0.75*pi)
   }
  }
 )
```