ACADGILD ASSIGNMENT 3.2

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

Answer:

```
#Vectorized form

set.seed(42)

#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(42)
#create matrix
mat_1<- replicate(10,rnorm(10))

#transform into data frame
df_1= data.frame(mat_1)
for(i in 1:10){
  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)
    }
  }
)
```