Session 3 – Foundational R Programming
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.**

```
x <- replicate(10,rnorm(10))
data_frame <- as.data.frame(x)
print(x)
summary(x)
t <- seq(0,10,0.1)
for (i in seq_len(nrow(x))) {
  for(j in seq_len(ncol(x))){

    print(x[i,j]) + sin(t)
  }

}
plot(x)
```

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data_frame <- as.data.frame(x)
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for (i in seq_len(nrow(x))) {
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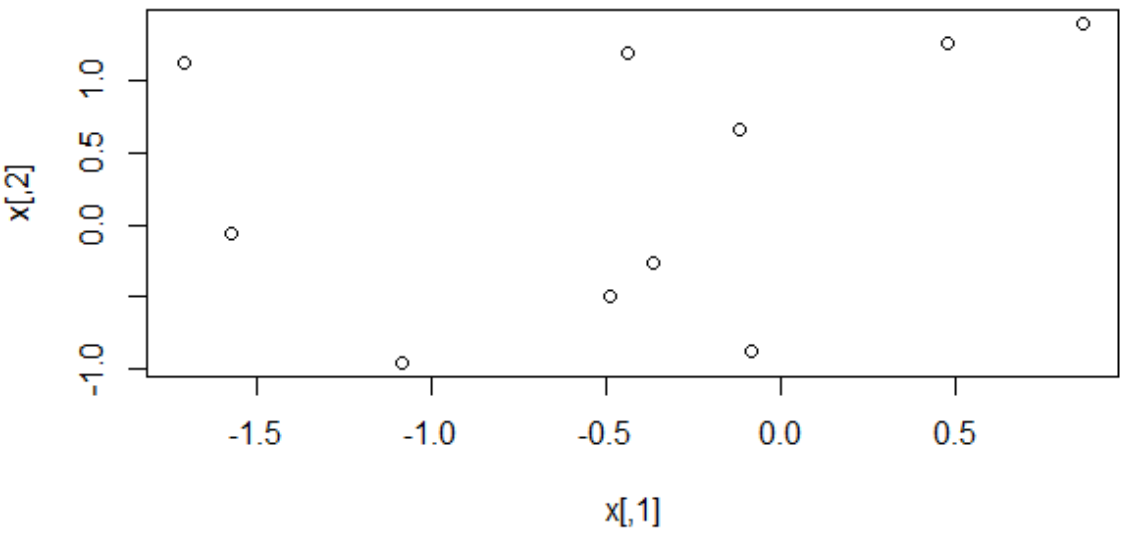
  }

}
plot(x)
```


x[,2]
1.0
0.5
0.0
-1.0
-1.5
-1.0
-0.5
0.0
0.5
x[,1]