**Programming for Analytics**

**Assignment-1 (100 Points)**

**Autumn 2020**

Please submit your R script for the following questions. 20 Points each.

Q1. Sort

# Attach(mtcars)

Sort dataframe by mpg (ascending) and cyl (descending)

attach(mtcars)

mtcars

Q1<-mtcars[order(mtcars$mpg,-mtcars$cyl),]

Q2. Subset

# Attach(mtcars)

Select cars whose horsepower (hp) is greater than Chrysler Imperial and sort the new dataframe by mpg.

attach(mtcars)

a<-which(rownames(mtcars)=='Chrysler Imperial')

b<-mtcars$hp[a]

mtcars\_hp<-subset(mtcars,subset=hp>b)

Q2<-mtcars\_hp[order(mtcars\_hp$mpg),]

Q3. For Loop

Calculate squared values for 1 to 25.

list<-c()

for (i in seq(1,25,by=1)){

list[[i]]<-i\*i

}

print(list)

Q4. For Loop

Calculate first 50 elements from Fibonacci Series [1,1,2,3,5,8,13,21,34….]

Fibonacci\_Series<-c(1:50)

Fibonacci\_Series[2]<-1

for (i in 3:50){

Fibonacci\_Series[i]<-Fibonacci\_Series[i-2]+Fibonacci\_Series[i-1]

}

print(Fibonacci\_Series)

Note: There are several solutions for this question. Please consider the primitive recursive solution takes *a lot* of time. You can measure processing time cost as below:

start.time <- Sys.time()

...Relevent codes...

end.time <- Sys.time() t

ime.taken <- end.time - start.time

time.taken

Q5. While Loop

You bought a house at price of $700K. If the interest to real estate market in the area increases and the estimated price of house goes above 750K, you may want to sell it. Otherwise, you will keep it. You will generate a random price between 600K and 800K for each quarter as a proxy for the interest to your house (The price can fluctuate between -100K to +100K around 700K after each quarter).

Design a while loop and show how many quarters (loops) will it take to sell the house.

Hint: There is no specific value for the answer since we generate random values with sample(x, size, replace = FALSE, prob = NULL) in each loop.

purchase\_price <- 700 #700k

market\_price<-700

nth\_quarter<-1 #loop

while (market\_price<750){

market\_price=purchase\_price+sample(-100:100,1)

nth\_quarter=nth\_quarter+1

print(nth\_quarter)

}

cat('It took',nth\_quarter,'quarters(loops) to sell the house.We sold the

house at $',market\_price,'.')