##Vytvoření vektoru----------------------------------------------------

c(1,2,3,4,5,6,7,8,9,10)

c(1:10)

x <- seq(1,10, by=2)

rep(x, times=2)

sample(x)

sample(x, size=1)

sample(x, size=5, replace=F)

##Dotazování na vector---------------------------------------------------

x <- c(5:15)

length(x)

head(x)

tail(x, n=3)

x[5]

x > 10

which(x > 10)

x[which(x > 10)]

x[x > 10]

x[-c(which(x > 10))]

which(x > 10 | x < 8)

which(x > 10 & x < 12)

which.max(x)

which.min(x)

##Faktory--------------------------------------------------------------------------------

factor(c("jablko", "malina", "jahoda", "orech", "malina"))

f <- factor(c(1:5))

mean(f)

factor(c(1, 0, 1, 0, 0), labels=c("ne", "ano"))

##Matice---------------------------------------------------------------------------------

x <- c(1:20)

matrix(x, nrow=5, ncol=4)

matrix(x, nrow=5, ncol=5)

m <- matrix(x, nrow=5, ncol=4, byrow=TRUE)

dim(m)

m.t <- t(m)

dim(m.t)

ncol(m)

nrow(m)

sum(m)

mean(m)

colSums(m)

rowSums(m)

apply(m, 2, FUN=mean)

x1 <- c(1:10)

x2 <- c(10:1)

cbind(x1, x2)

rbind(x1, x2)

##Dotazovani na matici-----------------------------------------

m[2,1]

m[,1]

m[2,]

m[,c(1,3)]

m[-3,c(1,3)]

colSums(m[-3,c(1,3)])

colnames(m) <- letters[1:4]

colnames(m)

m[,"a"]

###Zminit co je to array – vicerozmerny vektor stejného typu

array1 <- array(1:12, dim(2,3,2))

###Data frame-------------------------------------------------------

##každý sloupec může nést jiný typ dat X matrix

##slopce se dají pojmenovat a volat pres $

df <- as.data.frame(m)

class(df)

colnames(df)

df[,"sloupec2"]

df[, c("sloupec2", " sloupec3")]

df$sloupec3

m$sloupec1

df <- data.frame(prom1=1:5, char1=letters[1:5], empty=rep(NA, 5), logic = c(1:5)>3)

df

class(df)

class(df[,1])

class(df[,2])

class(df[,3])

class(df[,4])

df$empty <- rnorm(5)

df

class(df$empty)

###pridani noveho sloupce

df$new <- factor(sample(0:1, 5, replace = T), labels = c("ne", "ano"))

##List--------------------------------------------------------------------------------------------

my.list <- list(moje.matice = m, muj.df = df, novy.vec = 1:100)

my.list

my.list[[1]]

my.list$moje.matice

my.list[1]

class(my.list[1])

class(my.list[[1]])

my.list$NEW <- rnorm(1:100)

str(my.list)

my.list$muj.df

my.list$muj.df[,2]

my.list$muj.df$char1

my.list$muj.df$char1[3]

###empty list

my.list2 <- list()

my.list2

my.list2[[1]] <- rnorm(5)

my.list2[["druhy"]] <- 1:5

my.list2

unlist(my.list2)

names(my.list2)

names(my.list2)[1] <- "prvni"

unlist(my.list2)

my.list2[["treti"]] <- LETTERS[1:5]

unlist(my.list2)

tab.from.list <- do.call(rbind, my.list2)

tab.from.list <- as.data.frame(do.call(rbind, my.list2))

##export import dat--------------------------------------------------------------------------------------

data("mtcars")

mtcars

write.table(mtcars, file="Auta.txt", sep = "\t", dec=".")

write.csv

write.csv2

##import dat

moje.data <- read.delim("Auta2.txt", header=T, row.names = 1)

moje.data

class(moje.data)

class(moje.data$Klas)

class(moje.data$Klas2)

moje.data <- read.delim("./Moje\_data/Auta2.txt", header=T, row.names = 1)

###Obrazky

moje.data$Klas2[moje.data$Klas2 == 0] <- 2

plot(moje.data$hp, moje.data$qsec, pch=16, col= c("blue", "red")[moje.data$Klas2])