

## ##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"))
```

## ##Maticice-----

```
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"]
```

###Zmínit co je to array – vícerozmerný vektor stejného typu

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

###Data frame-----

##každý sloupec může nést jiný typ dat X matrix

##sloupce se dají pojmenovat a volat přes \$

```
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)
```

###přidání nového sloupce

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

##List-----

```
my.list <- list(moje.malice = 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])
```