

# **Introduction to R Software**

## **Vector Indexing**

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## Vector Indexing

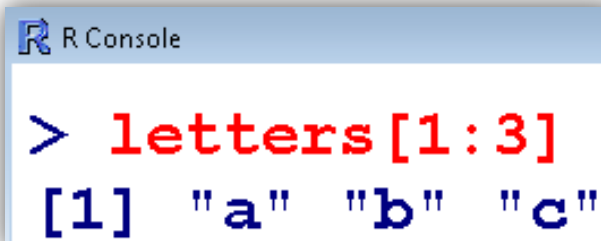
A vector of positive integers (`letters` and `LETTERS` return the 26 lowercase and uppercase letters, respectively).

```
> letters[1:3]  
[1] "a" "b" "c"
```

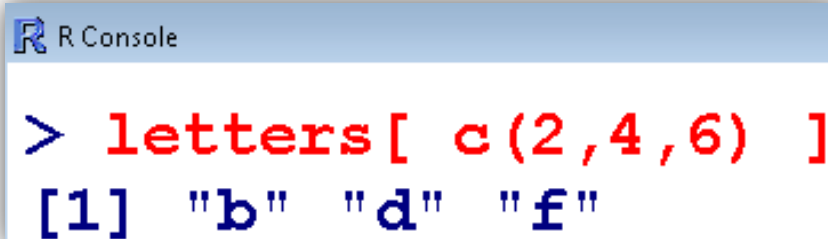
```
> letters[ c(2,4,6) ]  
[1] "b" "d" "f"
```

```
> LETTERS[1:3]  
[1] "A" "B" "C"
```

```
> LETTERS[ c(2,4,6) ]  
[1] "B" "D" "F"
```



```
R Console  
> letters[1:3]  
[1] "a" "b" "c"
```



```
R Console  
> letters[ c(2,4,6) ]  
[1] "b" "d" "f"
```

# Vector Indexing

## ❑ A logical vector

```
> x <- 1:10
```

```
>x
```

```
[1] 1 2 3 4 5 6 7 8 9 10
```

```
> x[ (x > 5) ]
```

```
[1] 6 7 8 9 10
```

```
> x[ (x%%2==0) ]  #%% indicates x mod y  
[1] 2 4 6 8 10    #values for which x mod 2 is 0
```

```
> x[ (x%%2==1) ]  
[1] 1 3 5 7 9      #values for which x mod 2 is 1
```

# Vector Indexing

R Console

```
> x <- 1:10
```

```
> x
```

```
[1] 1 2 3 4 5 6 7 8 9 10
```

```
> x[ (x>5) ]
```

```
[1] 6 7 8 9 10
```

```
> x[ (x%%2==0) ]
```

```
[1] 2 4 6 8 10
```

```
> x[ (x%%2==1) ]
```

```
[1] 1 3 5 7 9
```

# Vector Indexing

## □ A logical vector

```
> x[5] <- NA
```

```
> x
```

```
[1] 1 2 3 4 NA 6 7 8 9 10
```

```
> y <- x[ !is.na(x) ]  #! Means negation
```

```
> y
```

```
[1] 1 2 3 4 6 7 8 9 10 # 5 is missing
```

```
> mean(x)
```

```
[1] NA
```

```
> mean(y)
```

```
[1] 5.555556
```

# Vector Indexing

R Console

```
> x[5] <- NA
> x
[1] 1 2 3 4 NA 6 7 8 9 10
>
> y <- x[ !is.na(x) ]
> y
[1] 1 2 3 4 6 7 8 9 10
>
> mean(x)
[1] NA
>
> mean(y)
[1] 5.555556
```

# Vector Indexing

## ❑ Vector of negative integers

```
> x <- 1:10
```

```
> x
```

```
[1]  1  2  3  4  5  6  7  8  9 10
```

```
> x[-(1:5)]
```

```
[1]  6  7  8  9 10
```

has the same outcome as

```
> x[(6:10)]
```

```
[1]  6  7  8  9 10
```

# Vector Indexing

R Console

```
> x <- 1:10
```

```
> x
```

```
[1] 1 2 3 4 5 6 7 8 9 10
```

```
>
```

```
> x[-(1:5)]
```

```
[1] 6 7 8 9 10
```

```
>
```

```
> x[(6:10)]
```

```
[1] 6 7 8 9 10
```