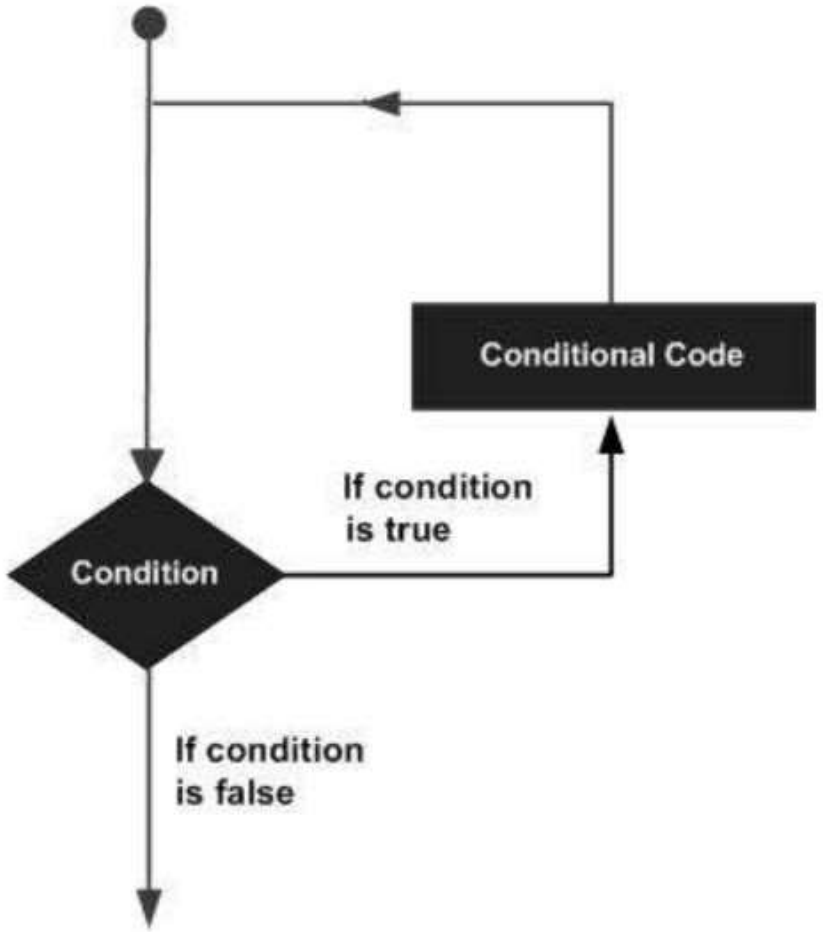
LOOPS

LOOPS IN R

- There may be a situation when you need to execute a block of code several number of times. In general, statements are executed sequentially. The first statement in a function is executed first, followed by the second, and so on.
- **repeat**
- **for**
- **while**


Conditional Code
If condition
is true
Condition
If condition
is false

Repeat Loop

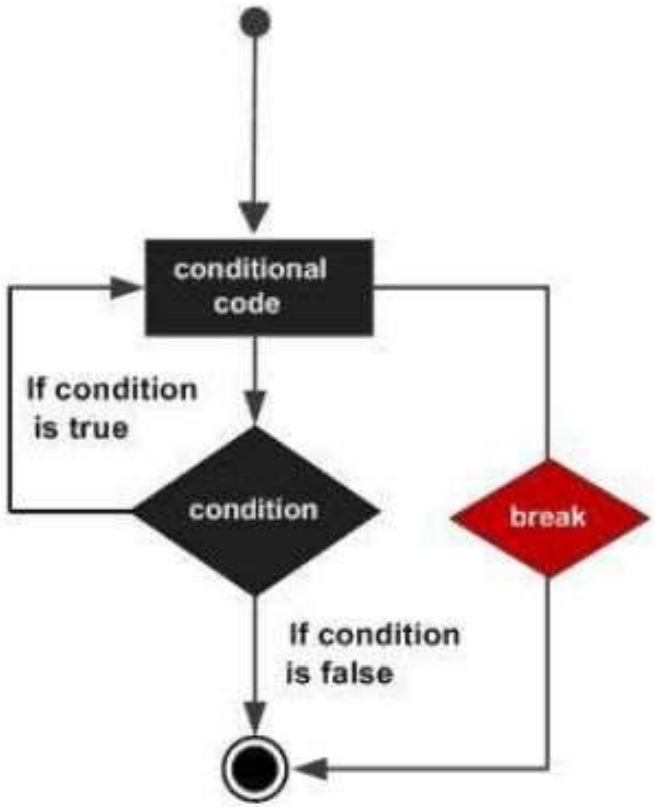
The **Repeat loop** executes the same code again and again until a stop condition is met.

Syntax

The basic syntax for creating a repeat loop in R is –

```
repeat {
   commands
   if(condition) {
      break
   }
}
```

Flow Diagram



Example

```
v <- c("Hello","loop")
cnt <- 2

repeat {
   print(v)
   cnt <- cnt+1

   if(cnt > 5) {
      break
   }
}
```

```
[1] "Hello" "loop"
[1] "Hello" "loop"
[1] "Hello" "loop"
[1] "Hello" "loop"
```

While

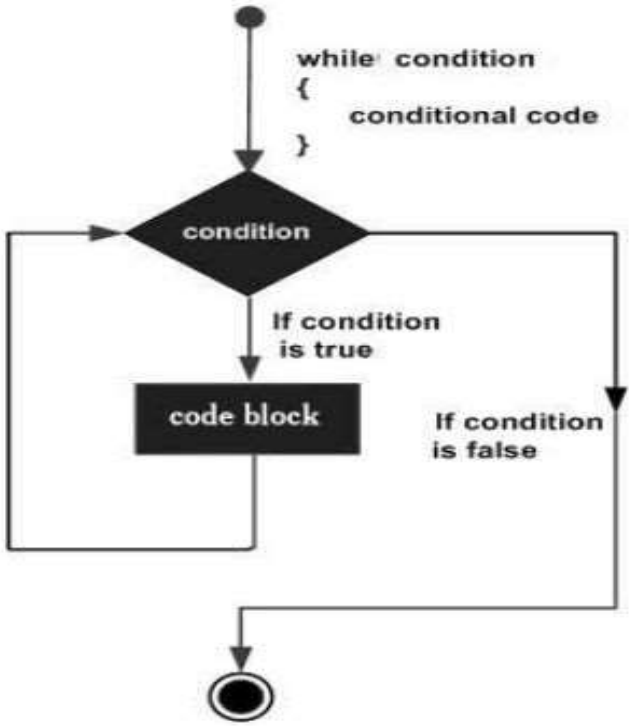
The While loop executes the same code again and again until a stop condition is met.

Syntax

The basic syntax for creating a while loop in R is –

```
while (test_expression) {
   statement
}
```

Flow Diagram



Here key point of the **while** loop is that the loop might not ever run. When the condition is tested and the result is false, the loop body will be skipped and the first statement after the while loop will be executed.

Example

```
v <- c("Hello","while loop")
cnt <- 2

while (cnt < 7) {
   print(v)
   cnt = cnt + 1
}
```

```
[1] "Hello"  "while loop"
[1] "Hello"  "while loop"
[1] "Hello"  "while loop"
[1] "Hello"  "while loop"
[1] "Hello"  "while loop"
```

- **Write a program to print countdown from n to 0 using while loop**

```
n = as.numeric(readline("Enter a value = "))
cat("numbers from ", n,"to 0")
while(n>=0){
  print(n)
  n=n-1
}
```

For

A **For loop** is a repetition control structure that allows you to efficiently write a loop that needs to execute a specific number of times.

Syntax

The basic syntax for creating a **for** loop statement in R is –

```
for (value in vector) {
   statements
}
```

Flowchart of for loop

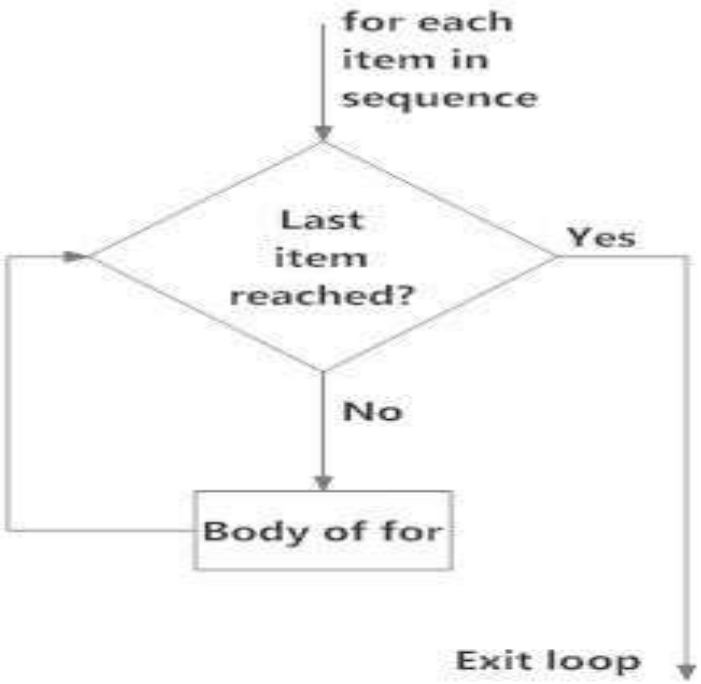


Fig: operation of for loop

```r
v <- LETTERS[1:4]
for ( i in v) {
   print(i)
}
```

```
[1] "A"
[1] "B"
[1] "C"
[1] "D"
```

- **Find even numbers in the following list using for loop**

  2,5,3,9,8,11,6

```
x <- c(2,5,3,9,8,11,6)
count <- 0
for (val in x) {
if(val %% 2 == 0)   count = count+1
}
print(count)
```

Output

```
[1] 3
```

- **Find factorial of a number using for loop**
- **Write a code for multiplication table**
- **Write a code for prime number**