

Control Structures

- **if, else:** testing a condition
- **for:** execute a loop for a fixed number of times
- **while:** execute a loop *while* a condition is true
- **repeat:** execute an infinite loop
- **break:** break the execution of a loop
- **next:** skip an iteration of a loop
- **return:** exit a function

if-else

```
if(<conditon>) {  
  ##do something  
}else {  
  ##do something else  
}
```

elseif construct

```
if(<conditon>) {  
  ##do something  
}else if(<condition2>){  
  ##do something different  
}else{  
  ##do something different  
}
```

small example

```
if(x>3){  
  y<-10  
}else{  
  y<-0  
}
```

no else required

```
if(<condition1>){  
  
}  
if(<condition2>){  
  
}
```

For Loops

```
for(i in 1:10){  
  print(i)  
}
```

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

```
x<-c("a","b","c","d")  
for(i in 1:4) {  
  print(x[i])  
}
```

```
## [1] "a"  
## [1] "b"  
## [1] "c"  
## [1] "d"
```

```
for (i in seq_along(x)){  
  print(x[i])  
}
```

```
## [1] "a"  
## [1] "b"  
## [1] "c"  
## [1] "d"
```

```
for(letter in x){  
  print(letter)  
}
```

```
## [1] "a"  
## [1] "b"  
## [1] "c"  
## [1] "d"
```

```
for(i in 1:4) print(x[i])
```

```
## [1] "a"  
## [1] "b"  
## [1] "c"  
## [1] "d"
```

```
x<-matrix(1:6,2,3)
for (i in seq_len(nrow(x))){
  for (j in seq_len(ncol(x))){
    print(x[i,j])
  }
}
```

```
## [1] 1
## [1] 3
## [1] 5
## [1] 2
## [1] 4
## [1] 6
```

While Loops

```
count<-0
while(count < 10){
  print(count)
  count<-count+1
}
```

```
## [1] 0
## [1] 1
## [1] 2
## [1] 3
## [1] 4
## [1] 5
## [1] 6
## [1] 7
## [1] 8
## [1] 9
```

```
z<-5
while (z>=3 && z<=10) {
  print(z)
  coin<-rbinom(1,1,0.5)

  if(coin==1){
    z<-z+1
  }else{
    z<-z-1
  }
}
```

```
## [1] 5
## [1] 6
## [1] 5
## [1] 6
## [1] 5
```

```
## [1] 4
## [1] 5
## [1] 6
## [1] 5
## [1] 6
## [1] 7
## [1] 6
## [1] 5
## [1] 6
## [1] 5
## [1] 6
## [1] 7
## [1] 8
## [1] 7
## [1] 8
## [1] 7
## [1] 8
## [1] 9
## [1] 10
## [1] 9
## [1] 10
## [1] 9
## [1] 10
```

Repeat, Next, Break

```
x0<-1
tol<-1e-8
repeat{
  x1<-computeEstimate()
  if(abs(x1-x0)<tol){
    break
  } else{
    x0<-x1
  }
}
```

```
for( i in 1:100){
  if(i <=20){
    next
  }
  ##do something
}
```