Class 5
R – Control Statements

Control statements/Structures

All programming languages are having the control statements.

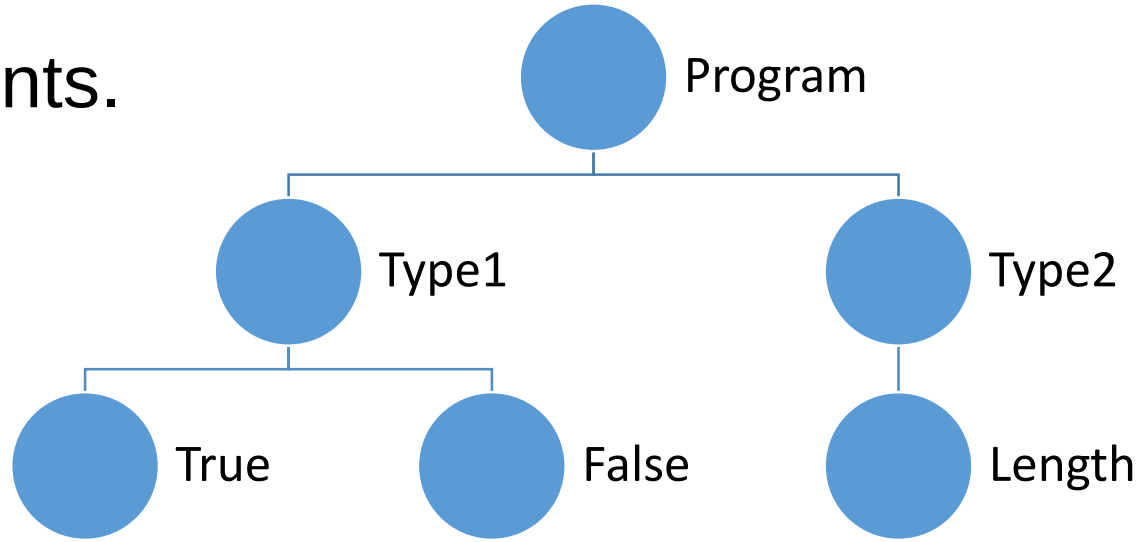
Path to specify the flow of programs.

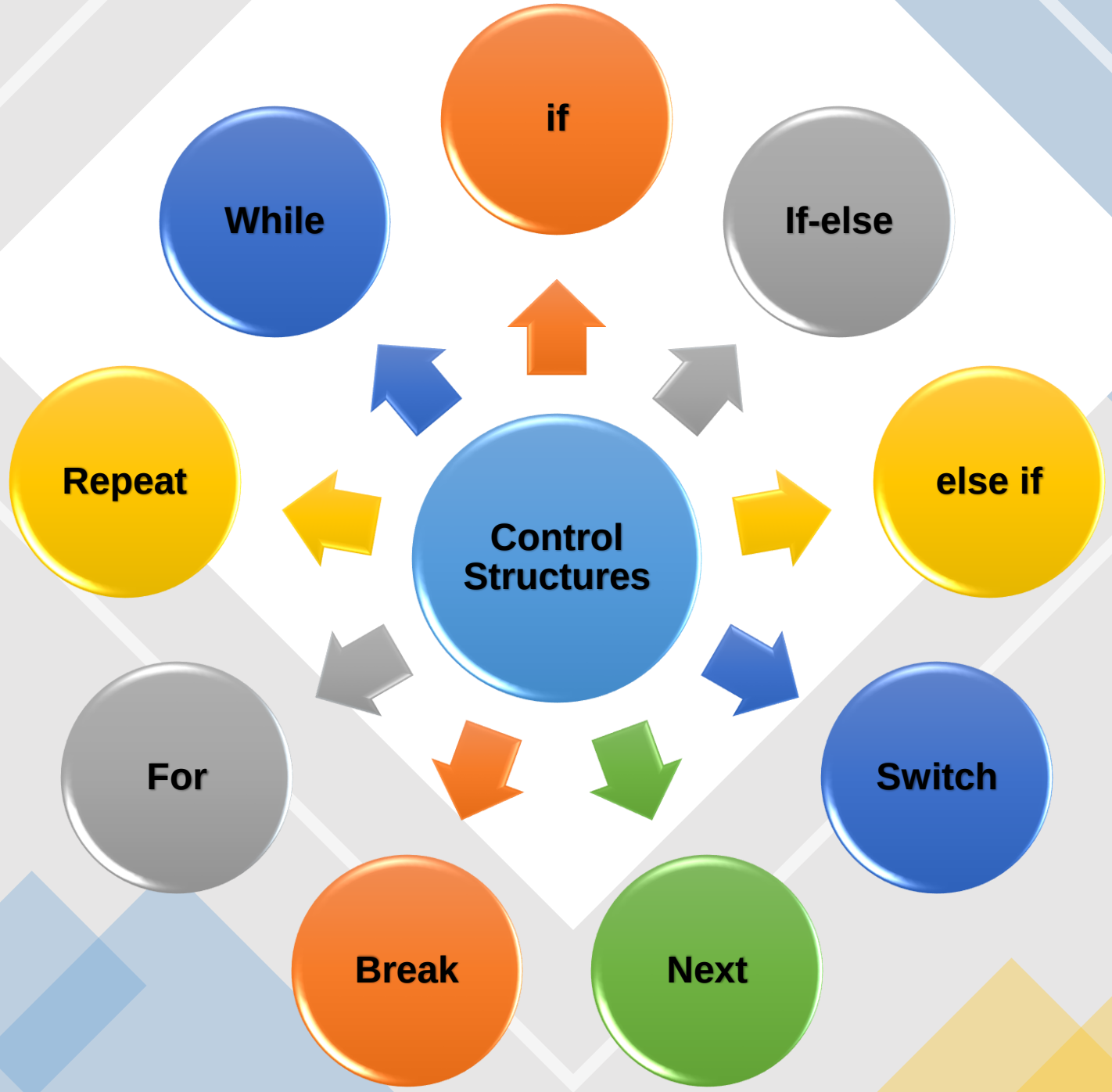
Decision will be taken based on the variable.

Control structures also called as a loop in R.

Control Structures

- R provides various control structures based on user requirements.
- { } used to declare the statements.



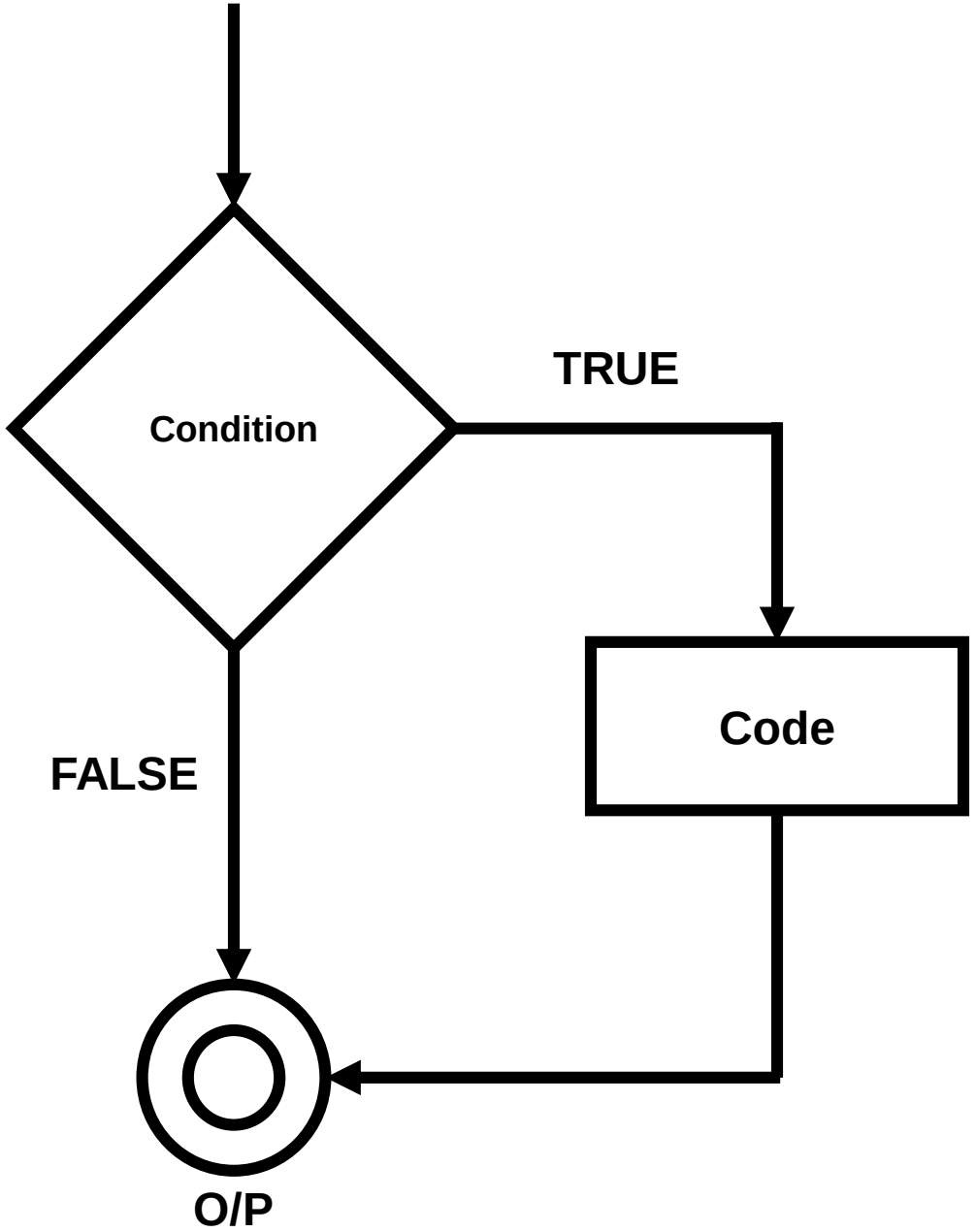

Control Structures
if
If-else
else if
Switch
Next
Break
For
Repeat
While

if statement

- Conditional programming statement
- Block of code will be executed when the condition is true.

```
if(Expression){
        statement
}
```

If Flow chart



if statement (Example)

Ex 1

```
a=10

if(a<20){

    print("10 < 20")

}
```

Ex 2

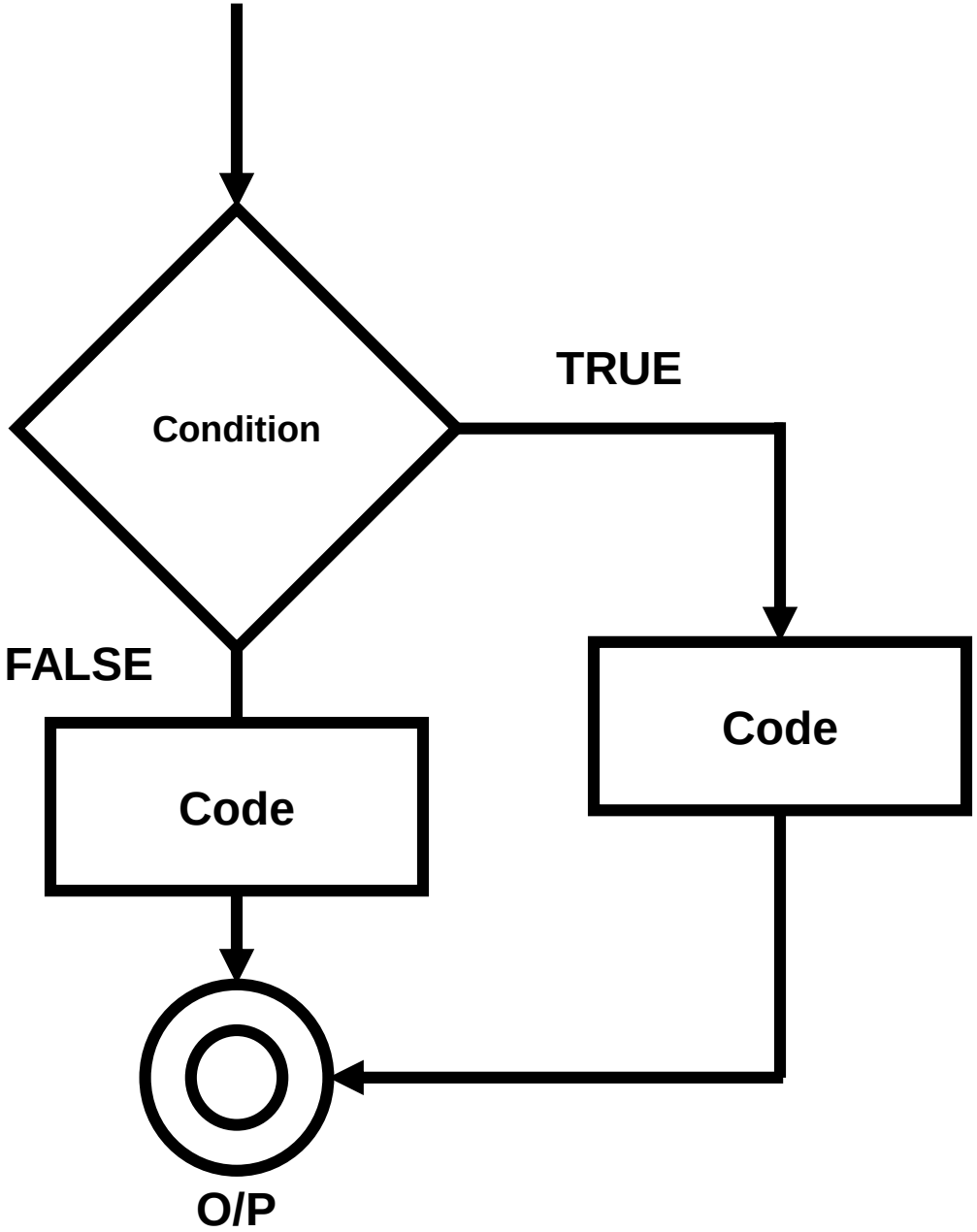
```
name="Bioinfo"

if(name=="Bioinfo"){

    print("TRUE")

}
```

If-else statement

- Similar to if statement
- else statement placed after the if condition. Else statement executed when if gets FALSE

```
if(Expression){
    statement
}
else{
    statement
}
```

If-else Flow chart



if-else statement (Example)

Ex 1

```
a=10

if(a>20){

     print("10 > 20")

}else{

     print("10 < 20")

}
```

Ex 2

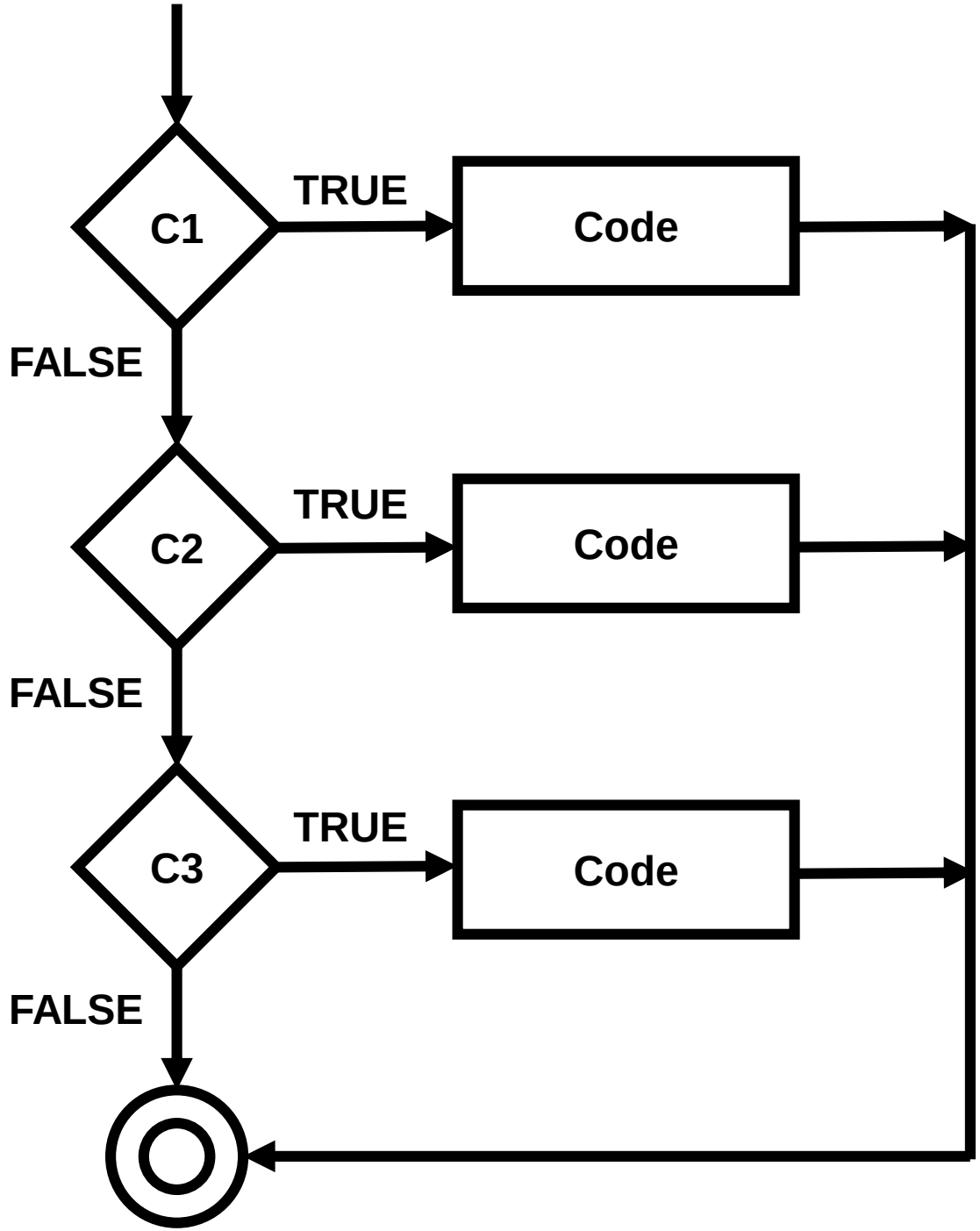
```
name="Bioinfo"

if(name=="Bioinfo"){

     print("TRUE")

}else{

     print("Not Bioinfo")

}
```

else-if statement

- Also known as nested if-else statement
- Used to check multiple conditions

```
if(Expression 1){
      statement
}
else if(Expression 2){
      statement
}
else{
      statement
}
```

else-if Flow chart



else-if statement (Example)

Ex 1

```
a=10
if(a>20){
      print("10 > 20")
}else if(a==10){
      print("a is 10")
}else{
      print("10 < 20")
}
```

Ex 2

```
name="Bioinfo"
if(name=="Bioinfo"){
      print("TRUE")
}else if(name=="Bioinformatics"){
      print("Bioinformatics")
}else{
      print("Not Bioinfo")
}
```

switch statement

- It tests an expression against the list of elements
- switch() function

    Case selection based on the index

    Case selection based on the matching value

```
switch(Expression,case1,case2,case3)
```

switch statement (Example)

Ex 1

```
>var_name <- switch(3,”Hi”,”Hello”,”Welcome”)

>print(var_name)
```

Ex 2

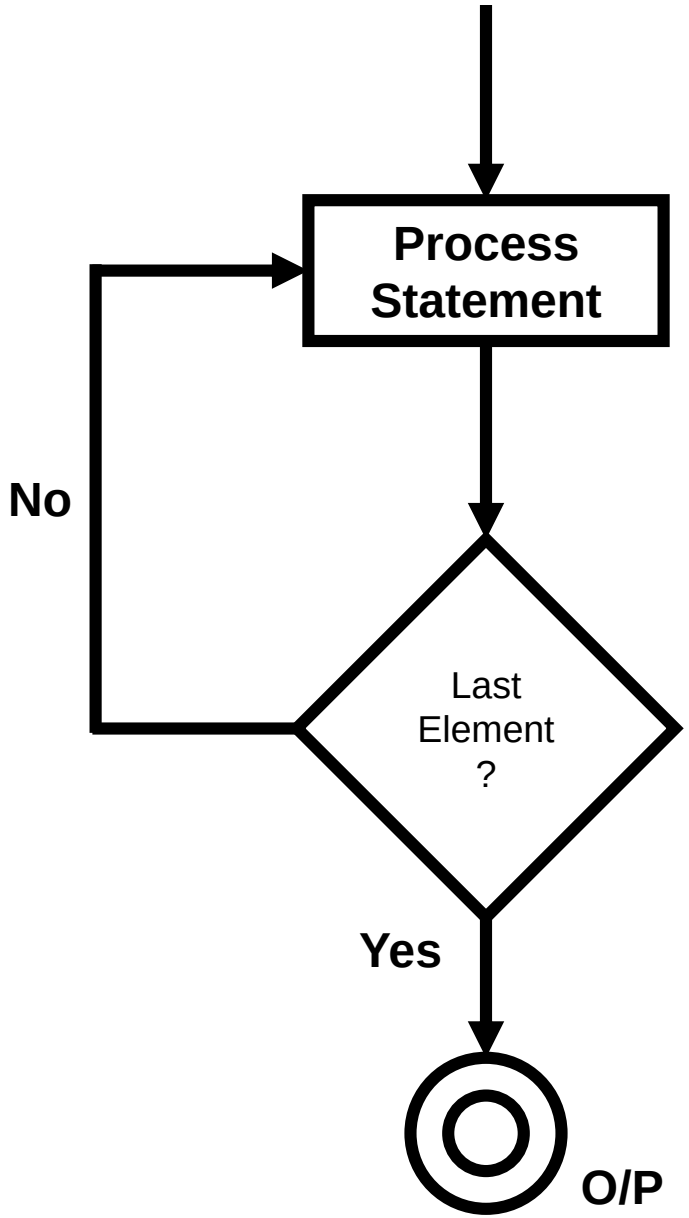
```
>value <- “3”

>var_name <-
     switch(value,”1”=“Red”,”2”=“Green”,”3”=“Blue”)

>print(var_name)
```

for statement

- Most popular control statement
- Used to iterate a vector
- Sequence of instructions repeated until a certain condition reached.
- User can pass character vectors, logical vectors, lists or expressions.

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

for Flow chart



for statement (Example)

Ex 1

```
num_var<-c(1,2,3,4,5)

for(i  in  num_var){

     print(i)

}
```

Ex 2

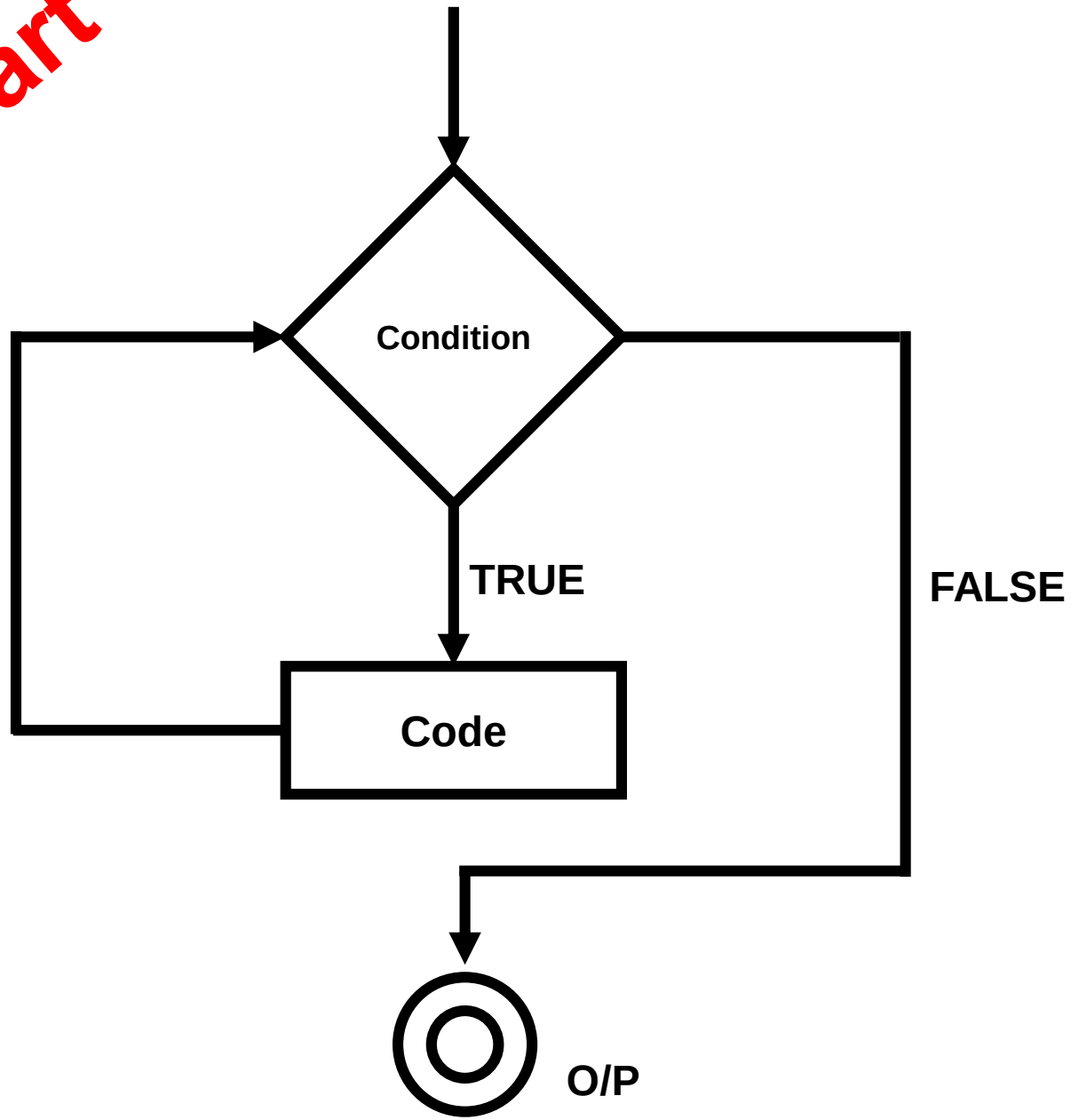
```
seq_var<-

c("ATG","UAG","UAA","UG

A")

for(i  in  seq_var){

     print(i)

}
```

while statement

- Type of control statement
- Iterate block of code several times
- Loop terminates when expression gets FALSE

```
while(Expression){
    Statement
}
```

while Flow chart



while statement (Example)

Ex

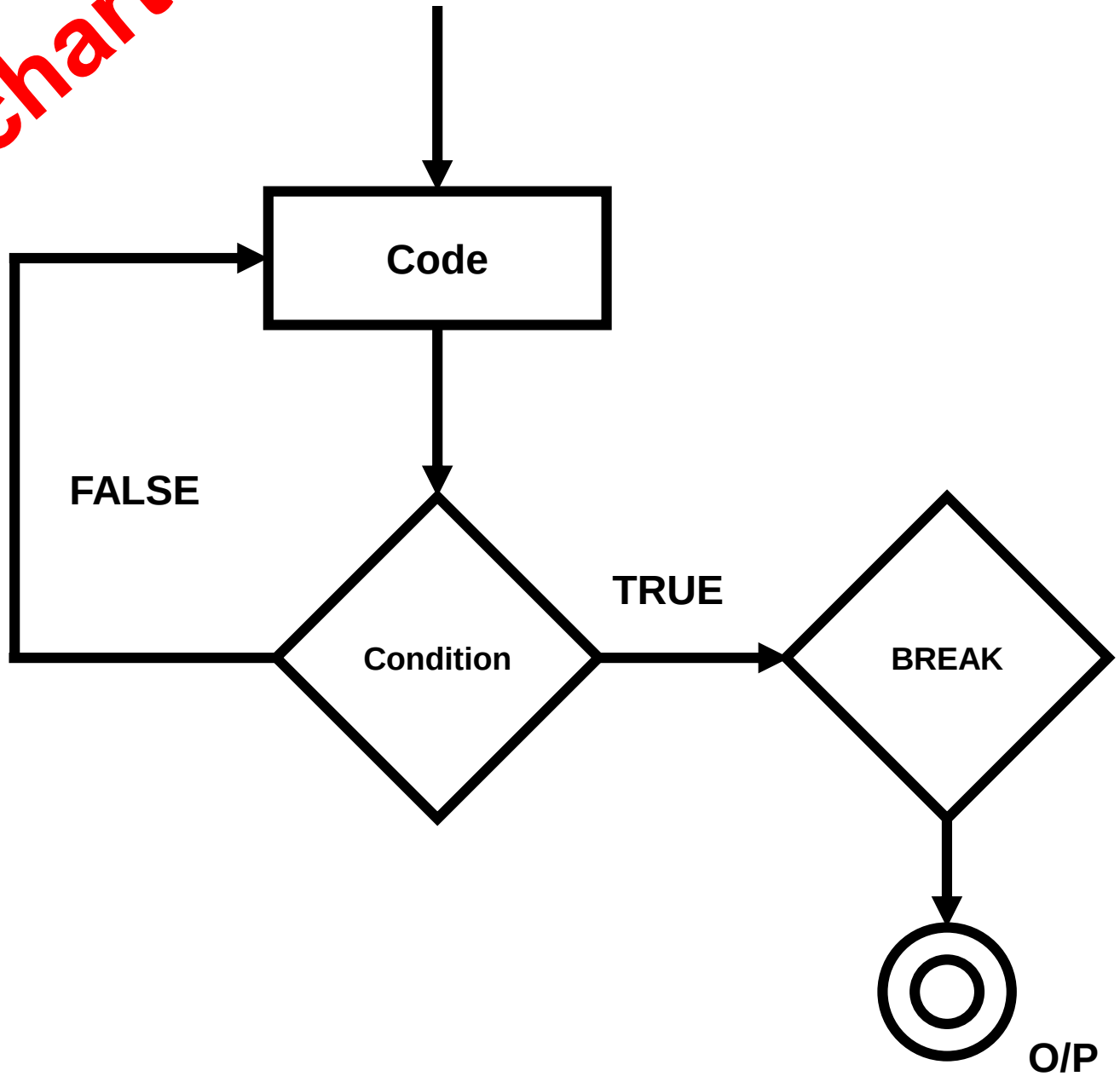
```
num_var<-10

while(num_var<20){

    print(num_var)

    num_var=num_var+1

}
```

repeat statement

- Special type of loop
- Iterates block of code
- No condition to exit from the loop
- break function should be used to exit from the loop
- Helpful to construct infinite loop

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

repeat Flow chart



repeat statement (Example)

Ex

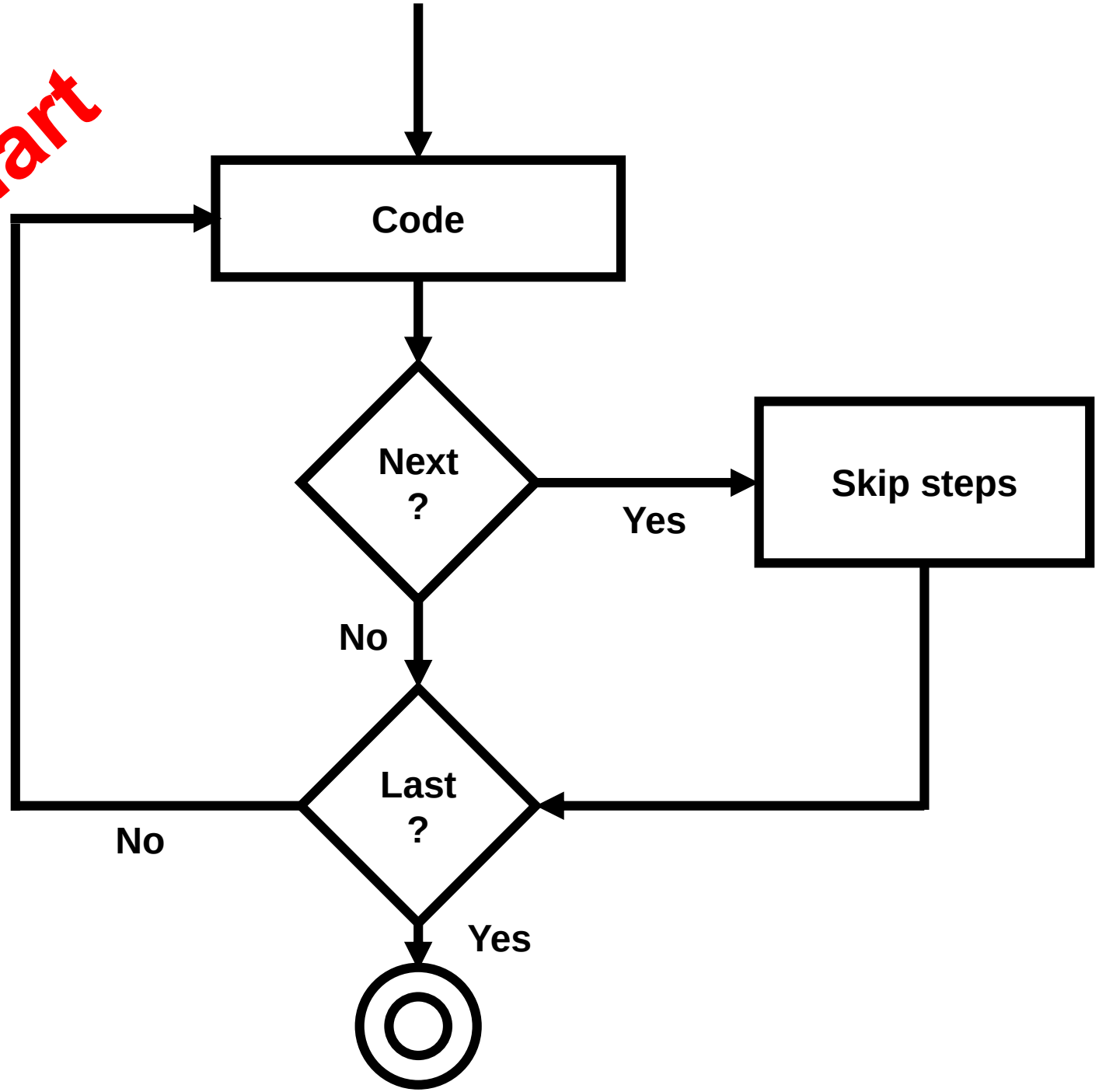
```
num_var<-c(1,2,3,4,5)

to_stop=1

repeat{

      print(num_var)

      to_stop=to_stop+1

      if(to_stop>5){

            break

      }

}
```

next statement

- Used to skip statements in the loop
- Starts next loop
- Syntax for creating next statement

```
next
```

next Flow chart



next statement (Example)

Ex

```
x <- c("ATG","UAG","UGA"," UAA")
for (codon in x) {
    if (codon == "UGA"){
        next
    }
print(codon)
}
```

return statement

- Used in the functions
- Return back the result
- Syntax for creating return statement

```
return()
```

return statement (Example)

Ex

```
something <- function(a){
     if(a==“AUG”){
          result <- “Start Codon”
     }
     else{
          result <- “Not Start Codon”
     }
     return(result)
}
something(“AUG”)
```