PairProgramming_If_else

William Hancock, Zachary D'Urso

2024-11-5

if-else

Pair programming exercise for DSE5002, on if and else operations

when the test condition in an if statement is met, then the following code block is run. Otherwise, not

if(condiction) { …put some commands here }

Suppose if x is less than 10, then we want to set y=0.125*x and z to x squared

This looks like

```
y=0
z=0
x=10

if(x<10)
{
  y=0.125*x
  z=x^2
}
#cat is a print function I am using here, the \n is a linefeed character
# to advance to the next line in the printing

cat("Y is ",y ,"\n")
```

```
## Y is  0
```

```
cat("Z is ",z)
```

```
## Z is  0
```

Action Required: alter my code so that Y and Z are not altered

#If-else

Suppose that when x<10, we want this calculation to run as above, but for other x values, we want y=0.25*x, and z=square root of x

We use an else statement

```
y=0
z=0
x=25

if(x<10)
{
  y=0.125*x
  z=x^2
}else
{
  y=0.25*x
  z=x^(0.5)
}
#cat is a print function I am using here, the \n is a linefeed character
# to advance to the next line in the printing

cat("Y is ",y ,"\n")
```

```
## Y is  6.25
```

```
cat("Z is ",z)
```

```
## Z is  5
```

Action Required:

Verify that this code works for a couple of different values of x when x = 5: y is 0.625, z is 25 when x = 10: z is 2.5, z is 3.162278 when x = 25: y is 6.25, z is 5

Note

Each if statement can only have one else

We can put if statements inside elses to allow for more possible options

```
x=5
if(x<0)
{
  cat("Negative X value\n")
}else
{if(x%%2==0)
  {
    cat("X is even\n")
  }
  else
  {
    cat("X is odd\n")
  }
  }
```

```
## X is odd
```

Alter this code and verify that it works

When x is 2, it returns even, when it is 1, it returns odd, and if it is negative, it prints Negative X value.

Compound test conditions

Using AND (&) and OR(|)

to decide what to do handle this decision

“I walk back the Starbucks some mornings, and while I like their coffee, the service is slow and I don’t like to wait. So I’ll stop for coffee there are 2 or less people in line. But if they have scones in stock, I’ll stop if there are 4 or less people in line”

Set up variables

people_in_line- which is an integer scones_in_stock-which is a binary or logical variable

What test condition would you need to figure out if I will stop at starbucks?

Set up an if statement that prints out the decision

```
people_in_line=3
scones_in_stock=TRUE

if(people_in_line<=2)
  {
    cat("Stopping for coffee \n")
}else
  {
if(people_in_line<=4 & scones_in_stock == TRUE)
  {
    cat("Stopping for coffee and scones\n")
}else
  {
    cat("Not stopping for coffee\n")
}
}
```

```
## Stopping for coffee and scones
```

If-else assignment statements

R has the ability to carry out assignments in an if-else operator

we send in a condition and two possible assignments, the first for TRUE, the second for FALSE

it might look like this

```
x=11
y=ifelse(x<10,0.125*x,0.25*x)
y
```

```
## [1] 2.75
```

Action: Verify that this behaves as expected when x is changed

When x = 5, y = 0.625 When x = 11, y = 2.75

This is not a structure I use much, it does save some time. I tend to use the less sophisticated approach shown above.