

R Code

```
1 ##### Relational operators #####
2
3 # Example 1
4 a <- 10
5 b <- 20
6
7 print(a > b)
8 print(a < b)
9 print(a == b)
10 print(a != b)
11
12 #example 2
13
14 10 > 5
15
16 3 < 2
17
18 6 >= 6
19
20 4 <= 7
21
22 # example 3
23
24 x <- c(2, 5, 8, 10)
25
26 x > 6
27
28 # example 4
29 x <- c(3, 7, 12, 15)
30
31 x <= 10
32
33
34 #####Logical Operators#####
35
36
37 # And (&)
38 #1
39 x <- 8
40
41 x > 5 & x < 10
42
43 #2
44 x <- 15
45 x < 10 & x > 20
46
47 #3
48 x <- 10
49 y <- 20
50
```

```
51  (x == 10) & (y == 20)
52
53  #4
54  x <- 1:6
55  (x > 2) & (x < 5)
56
57  # OR (|)
58
59  #1
60  x <- 8
61
62  x > 10 | x == 8
63
64
65  #2
66  x <- 1:6
67  (x > 2) | (x < 5)
68
69
70  # NOT (!)
71
72  x <- 8
73
74  !(x == 8)
75
76  x <- 10
77  !(x > 5)
78
79  x <- c(5, 12, 18, 3, 25)
80
81  !(x > 10)
82
83
84  # Missing data handling in R
85  # In R missing values are represented by "NA"
86
87
88  #Identify missing values
89
90  x <- c(10, 20, NA, 40, NA, 60)
91  is.na(x)
92
93  # Count missing values
94  x <- c(10, 20, NA, 40, NA, 60)
95  sum(is.na(x))
96
97  #Remove missing values
98  x <- c(10, 20, NA, 40, NA, 60)
99  na.omit(x)
100
101 #Replace missing values with mean
102 x <- c(10, 20, NA, 40, NA, 60)
103
104 x[is.na(x)] <- mean(x, na.rm = TRUE)
```

```
105 | x
106 |
107 |
108 | #####Conditional Execution #####
109 |
110 | # if condition
111 |
112 | # Example 1
113 | #1
114 | x <- 5
115 |
116 | if(x > 0){
117 |   print("Positive number")
118 | }
119 |
120 | # if-else conditional execution
121 | #1
122 | x <- -8
123 |
124 | if(x > 0){
125 |   print("Positive")
126 | } else {
127 |   print("Negative or Zero")
128 | }
129 |
130 | #2
131 | x <- 5
132 | if(x == 3) {
133 |   x <- x - 1
134 | } else {
135 |   x <- 2 * x
136 | }
137 | x
138 |
139 | #3
140 | n<-11
141 | if(n %% 2 == 0){
142 |   print("Even number")
143 | } else {
144 |   print("Odd number")
145 | }
146 |
147 |
148 | # Conditional execution using ifelse()
149 |
150 | #1
151 | x <- 1:10
152 | print(x)
153 |
154 | result <- ifelse(x < 6, x^2, x + 1)
155 | print(result)
156 |
157 |
158 | #2
```

```
159 x <- c(-5, 10, 0, -2, 8)
160
161 ifelse(x > 0, "Positive", "Non-Positive")
162
163 #3
164
165 x <- 1:10
166
167 ifelse(x %% 2 == 0, "Even", "Odd")
168
169 #4
170 amount <- c(500, 1200, 800, 2500)
171
172 discount <- ifelse(amount >= 1000, 0.10 * amount, 0)
173 discount
174
175 #5
176
177 x <- c(10, NA, 30, NA, 50)
178
179 ifelse(is.na(x), 0, x)
180
181 #####Practice Questions#####
182 #####Practice Set 1#####
183
184 #Missing Data + Relational + Logical Operators
185
186 #Q1
187 x <- c(12, NA, 25, 18, NA, 30, 10, NA)
188 Tasks:
189
190 #Display x
191 #Find which elements are NA
192 #Count total missing values
193 #Remove missing values
194 #Replace missing values with mean of available values
195 #Replace missing values with 0
196 #Print the updated vector after replacement
197
198 #Q2
199
200 v <- c(5, 12, 18, 3, 25, 8, 15)
201 #Find values greater than 10
202 #Find values less than 10
203 #Find values between 10 and 20 (inclusive)
204 #Find positions where values are greater than 10
205 #Find positions where values are even
206
207 #Q3
208 x <- 10
209 y <- 20
210 #Evaluate: (x == 10) & (y == 20)
```

```
213 #Evaluate: (x == 5) & (y == 20)
214 #Evaluate: (x == 10) | (y == 5)
215 #Evaluate: (x > 5) & (y < 10)
216 #Evaluate: !(x == 10)
217 #Evaluate: !(y == 10)
218
219 #Q4
220 z <- c(2, 6, 9, 12, 15, 18, 21, 25)
221 #Find values greater than 10 AND divisible by 3
222 #Find values less than 10 OR divisible by 5
223 #Find values NOT divisible by 2
224 #Count how many values are greater than 15
225
226
227
228
229
230
231
232
233
234
235
236
237
```