Worksheet: Nested and chained Conditionals

COSC 101, 2018-02-05

1) Warm-up
For each of the following programs: (1) draw a flowchart and (2) specify what output the program will produce.

a. hour = 12
   if (hour == 12):
      print("noon")
   if (hour > 12):
      print("AM")
   else:
      print("PM")

b. cost = 200
   refund = 3
   if (cost > 100):
      refund = 10
   refund = refund * 2
   print(refund)

Example: Nested conditionals
print("This is always first")
if x > 0:
   if y > 0:
      print("x is positive, y is positive")
   else:
      print("x is positive, y is negative")
else:
   print("x is negative")
print("This is always last")
2) Nested conditionals
For each program: (1) draw a flowchart, and (2) indicate what the program will output.

a. \(a = 19\)
   \[\text{if } a \geq 50:\]
   \[\quad \text{print}("\text{Big}\text{")}\]
   \[\text{else:}\]
   \[\quad \text{if } (a < 10):\]
   \[\quad \quad \text{print}("\text{Small}\text{")}\]
   \[\quad \text{else:}\]
   \[\quad \quad \text{print}("\text{Medium}\text{")}\]

b. \(i = 11, j = 19\)
   \[\text{if } i > 5: \]
   \[\quad \text{if } j > 15: \]
   \[\quad \quad \text{print}("\text{A}\text{")}\]
   \[\quad \text{else:}\]
   \[\quad \quad \text{if } j > 15: \]
   \[\quad \quad \quad \text{print}("\text{B}\text{")}\]
   \[\quad \text{if } i > 10: \]
   \[\quad \quad \text{print}("\text{C}\text{")}\]

Example: chained conditionals
\[\text{if } \text{day} \leq 7: \]
\[\quad \text{print}("1\text{st week}\text{")}\]
\[\text{elif } \text{day} > 7 \text{ and } \text{day} \leq 14: \]
\[\quad \text{print}("2\text{nd week}\text{")}\]
\[\text{else:}\]
\[\quad \text{print}("\text{Beyond}\text{")}\]
\[\text{print}("\text{End}\text{")}\]
3) Chained conditionals

Re-write the programs from the previous problem to use chained conditionals

a.

b.

4) Conditionals practice

For each of the following programs, which code blocks will be executed when the listed conditions are true?

a. if condition 1:
   code block A
   if condition 2:
   code block B
   elif condition 3:
   code block C
   else:
   code block D

When conditions 1 and 2 are True?
When conditions 2 and 3 are True?
When only condition 1 is True?
b. if condition 1:
   code block A
   if condition 2:
     code block B
    elif condition 3:
     code block C
   else:
     code block D

   When conditions 1 and 2 are True?
   When conditions 2 and 3 are True?
   When only condition 1 is True?

c. if condition 1:
   code block A
   if condition 2:
     code block B
   else:
     code block C
   if condition 3:
     code block D

   When conditions 1 and 2 are True?
   When conditions 2 and 3 are True?
   When only condition 1 is True?

**Programming practice**

a. Write a program that asks for a year and outputs ‘Before’ or ‘After’ depending on whether the provided year comes before or after 2018.

b. Write a program that asks for yesterday’s and today’s high temperatures and outputs ‘Today is warmer’, ‘Today is colder’, or ‘Today is the same’.

c. Write a program that asks for a user’s first, middle, and last names and outputs which is the longest.

d. Write a program that asks for a username and password. If the input matches one of the combinations below, then the program should print ‘Login successful’; otherwise it should print ‘Access denied’.

<table>
<thead>
<tr>
<th>Username</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>alice</td>
<td>colgate</td>
</tr>
<tr>
<td>carlos</td>
<td>python</td>
</tr>
</tbody>
</table>