مكتب

Lab Activity 🖥

Week 8: Multiple Paths with `if`/`else` and `elif`

Duration: 50 minutes — Work in pairs!

Name: _____   **Partner:** _____

Lab Goals

By the end of this lab, you will be able to:
- Add else blocks to handle both `True` and `False` cases
- Use `elif` for multiple choice decisions
- Write simple nested if statements
- Combine conditions with and/or operators

Getting Started

1. Extract the given `week8_lab.zip` file to your desktop. This folder contains all the files you need for this lab.

1 Exercise 1: Adding else to if (7 minutes)

Last week we learned `if` statements. This week, let's add else to handle both cases!

Open `week8_ex1.py` and type this code exactly as shown and run it:

```python
temperature = 35

if temperature > 30:
    print("It's hot today!")
    print("Drink lots of water.")
else:
    print("Temperature is pleasant.")
    print("Enjoy your day!")

print("Weather check complete.")
```

Now modify the code:

- Change temperature to 25. Before running, guess what gets printed?

  _____

  _____

- Add one more print statement in the else block

- Change the condition to check if temperature equals exactly 30. Print "It's exactly 30 degrees!".

✅ **Checkpoint:** Show your teacher the output before moving on!

💡 **Tip:** The else block runs when the if condition is False!

2 Exercise 2: Complete the Ticket Price Program (7 minutes)

Open `week8_ex2.py` and complete the movie ticket program:

```python
# Movie ticket prices
age = int(input("Enter your age: "))

# Check if eligible for child price
if age _____ 12:    # Less than or equal to 12
    price = 150
    print("Child ticket: Rs. 150")
_____:    # if it's not a child
    price = 300
    print("Adult ticket: Rs. 300")

# Apply student discount for teens
if age >= 13 _____ age <= 19:    # both conditions must be true
    print("Student discount available!")
    price = price - 50

print(f"Your ticket price: Rs. {price}")
```

Test values:

- Age 10: Should be Rs. 150 (child)

- Age 15: Should be Rs. 250 (adult with student discount)

- Age 25: Should be Rs. 300 (adult)

✅ **Checkpoint:** All test cases working? Show it to your teacher

👥 **Pair Programming:** Switch who types every 5 minutes!

3 Exercise 3: Explore elif Chains (10 minutes)

Let's make a simple grade message system using `elif`:

Step 1:
Open `week8_ex3.py` which has the following code snippet already written:

```python
# Grade feedback system
marks = int(input("Enter your marks (0-100): "))

if marks >= 90:
    print("Outstanding! A+")
elif marks >= 80:
    print("Excellent! A")
elif marks >= 70:
```

```
 9        print("Good work! B")
10    elif marks >= 60:
11        print("Keep trying! C")
12    else:
13        print("Need improvement. See teacher.")
```

Step 2: Try these experiments (run after each change):

1. Enter 95. What message appears?

   Result: _____

   Explain why: _____

2. Enter 85. Which elif executes? Explain why not the first if?

   Answer: _____

   _____

3. What happens if you enter 55?

   Result: _____

   Explain why: _____

Step 3: Add one more elif before the else:

- Check if marks >= 50

- Print "Pass, but aim higher! D"

> 💡 **Tip:** Only ONE block in an if/elif/else chain executes - the first True condition!

4 Exercise 4: Simple Nested if (8 minutes)

Open `week8_ex4.py` file which already has a basic structure for checking roller coaster eligibility *(need both `age` and `height`)*:

```
 1    # Roller coaster eligibility
 2    print("=== Roller Coaster Check ===")
 3
 4    age = int(input("Enter your age: "))
 5
 6    if age >= 12:
 7        print("Age requirement met!")
 8        # Now check height (nested if)
 9        height = int(input("Enter height in cm: "))
10
11        if height >= 140:
12            print("You can ride! Have fun!")
13        else:
14            print("Sorry, too short. Need 140cm.")
15    else:
16        print("Sorry, must be 12 or older.")
17        print("Try the kids' rides!")
```

Test with these combinations:

- Age 10: Should stop at age check

- Age 13, Height 135: Should fail height check

- Age 14, Height 145: Should allow riding

Now add another nested check:

- Inside the "You can ride!" section

- Ask "Do you have a ticket? (yes/no)"

- Only if yes: print "Head to the ride!"

- If no: print "Buy a ticket first!"

> ✅ **Checkpoint:** Nested conditions working correctly? Excellent!

5 Exercise 5: Mini-Challenge - Simple Restaurant Menu (13 minutes)

Create a program for a school cafeteria that:

1. Shows a simple menu

2. Asks what the student wants

3. Uses elif to handle different choices

4. Tells them the price

5. Checks if they have enough money

Example Output:

```
=== School Cafeteria ===
1. Sandwich - Rs. 50
2. Biryani - Rs. 80
3. Juice - Rs. 30

What would you like? (1/2/3): 2
You chose Biryani!
Price: Rs. 80

How much money do you have? Rs. 100
Great! You have enough. Enjoy your meal!
Your change: Rs. 20
```

Starter Help:

Open week8_ex5.py and start with this code snippet:

```python
# School cafeteria program
print("=== School Cafeteria ===")
print("1. Sandwich - Rs. 50")
print("2. Biryani - Rs. 80")
print("3. Juice - Rs. 30")
print()
```

```
8   choice = input("What would you like? (1/2/3): ")
9
10  # Use elif to handle choices
11  if choice == "1":
12      item = "Sandwich"
13      price = 50
14  # Add elif for choice 2
15
16  # Add elif for choice 3
17
18  # Add else for invalid choice
19
20  print(f"You chose {item}!")
21  print(f"Price: Rs. {price}")
22
23  # Now check if they have enough money
24  money = int(input("\nHow much money do you have? Rs. "))
25
26  # Add if/else to check money vs price
```

👥 **Pair Programming:** Switch who types every 5 minutes!

Test your program with:

- Choice 1, Money 100 (enough)

- Choice 2, Money 70 (not enough)

- Choice 4 (invalid)

Bonus: Add a 4th menu item!

✅ **Checkpoint:** Menu program working? Show your teacher!

6   Exercise 6: Quick Quiz (5 minutes)

Circle the correct answer:
1. What happens when an if condition is False and there's an else?

○ The program crashes

○ The else block runs

○ Nothing happens

○ Both blocks run

2. In an if/elif/elif/else chain, how many blocks can execute at a time?

○ All of them

○ Only one

○ At least two

○ None

3. What's the output of this code when x = 15?

```python
1  if x > 20:
2      print("A")
3  elif x > 10:
4      print("B")
5  elif x > 5:
6      print("C")
7  else:
8      print("D")
```

○ A

○ B

○ C

○ B and C

○ B, C and D

4. Which operator combines two conditions where both must be True?

○ or

○ and

○ not

○ else

5. In nested if statements, the inner if only runs when:

○ Always

○ The outer if is True

○ The outer if is False

○ Never

7　Lab Summary

✅ **Checkpoint:** Final checkpoint - make sure you have:

☐ Completed all exercises with your partner

☐ Used if/else for two-way decisions

☐ Created elif chains for multiple choices

☐ Written a nested if statement

☐ Made the cafeteria menu program

☐ Shown checkpoints to your teacher

Reflection (2 minutes)

Rate your understanding of today's concepts:

Concept	🙁 Need Help	😐 Getting It	🙂 Got It!
if/else statements	○	○	○
elif chains	○	○	○
Nested if statements	○	○	○
and/or operators	○	○	○

One thing I learned today: _____

One thing I'm still confused about: _____

☻ **Great work with multiple decision paths!**