Day 5 of Training at Ansh Info Tech

Topics Covered

- **if-elif-else conditionals**
- **input() Function**
- **for Loop**
- **while Loop**
- **30 Practice Questions on if-elif-else Statements**
- **40 Practice Questions on for and while loops**

Summary

if-elif-else Conditionals

Conditional statements are used to execute code based on specific conditions. The `if` statement evaluates a condition and executes the block of code if the condition is true. The `elif` (else if) statement allows for multiple conditions to be checked sequentially, and the `else` statement executes code if none of the previous conditions are true.

Practice Questions on if-elif-else Statements

1. Write a program to check if a number is positive, negative, or zero.
2. Determine the largest of three numbers.
3. Check if a year is a leap year.
4. **And many more...**

input() Function

The `input()` function is used to take input from the user. It reads a line from input, converts it to a string, and returns it. This is useful for interactive programs where user input is required.

for Loop

The `for` loop is used to iterate over a sequence (e.g., a list, tuple, dictionary, set, or string). It executes a block of code for each item in the sequence. The syntax includes the loop variable and the sequence to iterate over.

while Loop

The `while` loop repeatedly executes a block of code as long as a specified condition is true. This loop is useful when the number of iterations is not known beforehand, and the loop should continue until a condition changes.

Practice Questions on for and while Loops

1. Print the first 10 natural numbers using a `for` loop.
2. Calculate the factorial of a number using a `while` loop.
3. Iterate through a list and print only even numbers.
4. **And many more...**

1. You have a variable `age`. Write a conditional statement to check if `age` is greater than or equal to 18. If true, print "You are an adult", otherwise print "You are a minor".
2. Given a variable `temperature`, write a conditional statement to check if `temperature` is below 0. If true, print "It's freezing", otherwise print "It's not freezing".
3. You have a variable `score`. Write a conditional statement to check if `score` is greater than 90. If true, print "Grade A", if `score` is between 80 and 90, print "Grade B", otherwise print "Grade C".
4. Given two variables `a` and `b`, write a conditional statement to check if `a` is equal to `b`. If true, print "a and b are equal", otherwise print "a and b are not equal".
5. You have a variable `number`. Write a conditional statement to check if `number` is even or odd. If even, print "Even number", otherwise print "Odd number".
6. Given a variable `day` which can be any day of the week, write a conditional statement to print "Weekend" if the day is "Saturday" or "Sunday", otherwise print "Weekday".
7. You have a variable `marks`. Write a conditional statement to check if `marks` are greater than 75. If true, print "Distinction", if `marks` are between 50 and 75, print "Pass", otherwise print "Fail".
8. Given a variable `speed`, write a conditional statement to check if `speed` is greater than 120. If true, print "Over speed limit", otherwise print "Within speed limit".
9. You have a variable `year`. Write a conditional statement to check if `year` is a leap year. If true, print "Leap year", otherwise print "Not a leap year".
10. Given a variable `char`, write a conditional statement to check if `char` is a vowel (a, e, i, o, u). If true, print "Vowel", otherwise print "Consonant".
11. You have two variables `x` and `y`. Write a conditional statement to check if both `x` and `y` are positive. If true, print "Both are positive", otherwise print "At least one is not positive".

12. Given a variable `time` representing the hour of the day in 24-hour format, write a conditional statement to print "Good morning" if `time` is between 6 and 12, "Good afternoon" if `time` is between 12 and 18, and "Good evening" if `time` is between 18 and 24.
13. You have a variable `budget` and a variable `price`. Write a conditional statement to check if `budget` is greater than or equal to `price`. If true, print "Purchase possible", otherwise print "Not enough budget".
14. Given a variable `username`, write a conditional statement to check if `username` is not empty. If true, print "Username is valid", otherwise print "Username cannot be empty".
15. You have a variable `weight` and a variable `height`. Write a conditional statement to calculate BMI and print "Underweight" if BMI is less than 18.5, "Normal weight" if BMI is between 18.5 and 24.9, and "Overweight" if BMI is 25 or above.
16. Given a variable `password`, write a conditional statement to check if the length of `password` is greater than or equal to 8. If true, print "Strong password", otherwise print "Weak password".
17. You have a variable `grade`. Write a conditional statement to print "Excellent" if `grade` is 'A', "Good" if `grade` is 'B', "Average" if `grade` is 'C', and "Poor" if `grade` is 'D'.
18. Given a variable `month`, write a conditional statement to check if `month` is "December", "January", or "February". If true, print "Winter", if `month` is "June", "July", or "August", print "Summer", otherwise print "Other season".
19. You have a variable `balance`. Write a conditional statement to check if `balance` is greater than or equal to 1000. If true, print "Sufficient balance", otherwise print "Insufficient balance".
20. Given a variable `number`, write a conditional statement to check if `number` is positive, negative, or zero. Print "Positive", "Negative", or "Zero" accordingly.
21. You have a variable `ticket_type`. Write a conditional statement to check if `ticket_type` is "VIP". If true, print "Access to VIP lounge", otherwise print "Regular access".
22. Given a variable `age`, write a conditional statement to print "Eligible for senior citizen discount" if `age` is 65 or above.
23. You have a variable `color`. Write a conditional statement to print "Stop" if `color` is "Red", "Ready" if `color` is "Yellow", and "Go" if `color` is "Green".
24. Given a variable `temperature`, write a conditional statement to check if `temperature` is above 100. If true, print "Boiling point", otherwise print "Below boiling point".
25. You have a variable `loan_amount`. Write a conditional statement to check if `loan_amount` is greater than 50000. If true, print "Approval requires higher authority", otherwise print "Loan approved".

26. Given a variable `attendance`, write a conditional statement to check if `attendance` is greater than 75%. If true, print "Eligible to appear in exam", otherwise print "Not eligible to appear in exam".
27. You have a variable `membership_status`. Write a conditional statement to print "Premium member" if `membership_status` is "Gold", "Regular member" if `membership_status` is "Silver", and "Basic member" if `membership_status` is "Bronze".
28. Given a variable `age`, write a conditional statement to check if `age` is between 13 and 19. If true, print "Teenager", otherwise print "Not a teenager".
29. You have a variable `income`. Write a conditional statement to print "High income" if `income` is above 100000, "Middle income" if `income` is between 50000 and 100000, and "Low income" if `income` is below 50000.
30. Given a variable `fuel_level`, write a conditional statement to check if `fuel_level` is less than 10%. If true, print "Low fuel warning", otherwise print "Fuel level sufficient".

```
# Question 1
age = 20
if age >= 18:
    print("You are an adult")
else:
    print("You are a minor")

# Question 2
temperature = -5
if temperature < 0:
    print("It's freezing")
else:
    print("It's not freezing")

# Question 3
score = 85
if score > 90:
    print("Grade A")
elif 80 <= score <= 90:
    print("Grade B")
else:
    print("Grade C")

# Question 4
a = 5
b = 5
if a == b:
    print("a and b are equal")
else:
    print("a and b are not equal")

# Question 5
number = 4
if number % 2 == 0:
    print("Even number")
else:
    print("Odd number")

# Question 6
day = "Sunday"
if day == "Saturday" or day == "Sunday":
    print("Weekend")
else:
    print("Weekday")

# Question 7
marks = 78
if marks > 75:
    print("Distinction")
elif 50 <= marks <= 75:
    print("Pass")
```

```
else:
    print("Fail")

# Question 8
speed = 130
if speed > 120:
    print("Over speed limit")
else:
    print("Within speed limit")

# Question 9
year = 2024
if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
    print("Leap year")
else:
    print("Not a leap year")

# Question 10
char = 'a'
if char in 'aeiou':
    print("Vowel")
else:
    print("Consonant")

# Question 11
x = 10
y = 20
if x > 0 and y > 0:
    print("Both are positive")
else:
    print("At least one is not positive")

# Question 12
time = 15
if 6 <= time < 12:
    print("Good morning")
elif 12 <= time < 18:
    print("Good afternoon")
elif 18 <= time < 24:
    print("Good evening")
else:
    print("Good night")

# Question 13
budget = 100
price = 90
if budget >= price:
    print("Purchase possible")
else:
    print("Not enough budget")
```

```
# Question 14
username = "user123"
if username:
    print("Username is valid")
else:
    print("Username cannot be empty")

# Question 15
weight = 70  # in kg
height = 1.75  # in meters
bmi = weight / (height ** 2)
if bmi < 18.5:
    print("Underweight")
elif 18.5 <= bmi < 24.9:
    print("Normal weight")
else:
    print("Overweight")

# Question 16
password = "mypassword"
if len(password) >= 8:
    print("Strong password")
else:
    print("Weak password")

# Question 17
grade = 'B'
if grade == 'A':
    print("Excellent")
elif grade == 'B':
    print("Good")
elif grade == 'C':
    print("Average")
elif grade == 'D':
    print("Poor")

# Question 18
month = "December"
if month in ["December", "January", "February"]:
    print("Winter")
elif month in ["June", "July", "August"]:
    print("Summer")
else:
    print("Other season")

# Question 19
balance = 1500
if balance >= 1000:
    print("Sufficient balance")
else:
    print("Insufficient balance")
```

```
# Question 20
number = -10
if number > 0:
    print("Positive")
elif number < 0:
    print("Negative")
else:
    print("Zero")

# Question 21
ticket_type = "VIP"
if ticket_type == "VIP":
    print("Access to VIP lounge")
else:
    print("Regular access")

# Question 22
age = 70
if age >= 65:
    print("Eligible for senior citizen discount")

# Question 23
color = "Red"
if color == "Red":
    print("Stop")
elif color == "Yellow":
    print("Ready")
elif color == "Green":
    print("Go")

# Question 24
temperature = 101
if temperature > 100:
    print("Boiling point")
else:
    print("Below boiling point")

# Question 25
loan_amount = 60000
if loan_amount > 50000:
    print("Approval requires higher authority")
else:
    print("Loan approved")

# Question 26
attendance = 80
if attendance > 75:
    print("Eligible to appear in exam")
else:
    print("Not eligible to appear in exam")
```

```
# Question 27
membership_status = "Gold"
if membership_status == "Gold":
    print("Premium member")
elif membership_status == "Silver":
    print("Regular member")
elif membership_status == "Bronze":
    print("Basic member")

# Question 28
age = 16
if 13 <= age <= 19:
    print("Teenager")
else:
    print("Not a teenager")

# Question 29
income = 55000
if income > 100000:
    print("High income")
elif 50000 <= income <= 100000:
    print("Middle income")
else:
    print("Low income")

# Question 30
fuel_level = 8
if fuel_level < 10:
    print("Low fuel warning")
else:
    print("Fuel level sufficient")
```

Practice Questions of Loops

1. You are managing a list of employee ages. Print each age from the list using a for loop.
2. You have a string representing a secret message. Use a while loop to print each character until you reach a period (.).
3. You are given a list of daily temperatures. Use a for loop to calculate and print the average temperature for the week.
4. You need to distribute candies to children. Print each child's name and the number of candies they receive, distributing 1 to 20 candies using a for loop.
5. You are processing a list of book titles. Use a for loop to print each title in uppercase.

6. You are counting items in a warehouse. Use a for loop to skip printing the count for the item labeled "defective", but print counts for all other items.
7. You are programming a countdown timer. Write a while loop to print the countdown from 10 to 0.
8. You are analyzing sales data. Use a for loop to find and print the highest sale amount from a list of sales figures.
9. You are creating a sequence of special offers. Use a for loop to generate and print the first 10 offers based on the Fibonacci sequence.
10. You are maintaining a guest list. Use a for loop to print each guest's name, but stop if you encounter the name "VIP".
11. You are designing a game where players' names are stored in a string. Use a while loop to print the players' names in reverse order.
12. You are calculating class averages. Use a for loop to calculate and print the average grade from a list of grades.
13. You are creating a list of odd-numbered lockers. Use a for loop to print all odd locker numbers from 1 to 50.
14. You are checking production line output. Use a while loop to print each item produced until you encounter a defective item marked with a negative number.
15. You are performing data analysis on a list of survey responses. Use a for loop to create a new list containing the squared value of each response.
16. You are organizing a fun run. Use a for loop to iterate over participant numbers from 1 to 30, printing "Short Run" for multiples of 3, "Long Run" for multiples of 5, and "Marathon" for multiples of both 3 and 5.
17. You are managing a grid-based game. Use nested for loops to print each cell value in a 2D grid representing the game board.
18. You are summing digits of a player's score repeatedly until the score is a single digit. Use a while loop to perform this sum.
19. You are processing a list of player scores. Use a for loop to find and print the lowest score.
20. You are developing a text analysis tool. Use a for loop to count and print the number of vowels in a given string.
21. You are writing a program to print multiplication tables. Use a while loop to print the multiplication table for a given number up to 10.

22. You are filtering a list of survey responses. Use a for loop to create a new list containing only positive responses.
23. You are creating a prime number generator for a range of numbers from 1 to 100. Use a for loop to print all prime numbers in this range.
24. You are creating a menu-driven application. Use a while loop to repeatedly ask the user for input until they type "exit".
25. You are calculating cumulative donations. Use a for loop to print the running total of donations from a list.
26. You are converting temperatures for a weather app. Use a for loop to convert each temperature from Celsius to Fahrenheit and print the results.
27. You are parsing configuration settings stored as a list of dictionaries. Use a for loop to print each key-value pair.
28. You are reversing an array of data points. Use a while loop to reverse a list and print the reversed list.
29. You are finding the longest word in a list of keywords. Use a for loop to determine and print the longest keyword.
30. You are developing a program to calculate factorials. Use a for loop to print the factorial of a given number.
31. You are summing pairs of numbers from a list of tuples. Use nested for loops to print the sum of each pair.
32. You are indexing characters in a string for a text editor. Use a for loop to print each character and its index.
33. You are generating a sequence of numbers based on the sum of the two preceding numbers. Use a while loop to generate the first 15 terms.
34. You are performing data transformation. Use a for loop to print each number in a list along with its square.
35. You are processing matrix data. Use nested for loops to print the transpose of a given matrix.
36. You are implementing the Euclidean algorithm. Use a while loop to find the greatest common divisor (GCD) of two numbers.
37. You are parsing a text document. Use a for loop to print each word in a sentence on a new line.
38. You are logging events. Use a while loop to print event messages until a "stop" event is encountered.

39. You are summing numbers in a list until the total exceeds a certain threshold. Use a while loop to print the cumulative sum and stop once the threshold is exceeded.
40. You are formatting names in a contact list. Use a for loop to print each name in "Last, First" format.

```
# 1. You are managing a list of employee ages. Print each age from the list using a for loop
employee_ages = [25, 34, 28, 45, 50]
for age in employee_ages:
    print(age)

# 2. You have a string representing a secret message. Use a while loop to print each charact
secret_message = "Hello world. This is a secret."
i = 0
while i < len(secret_message) and secret_message[i] != '.':
    print(secret_message[i], end="")
    i += 1

# 3. You are given a list of daily temperatures. Use a for loop to calculate and print the a
daily_temperatures = [70, 68, 71, 73, 69, 72, 74]
total_temp = 0
for temp in daily_temperatures:
    total_temp += temp
average_temp = total_temp / len(daily_temperatures)
print("Average temperature:", average_temp)

# 4. You need to distribute candies to children. Print each child's name and the number of c
children = ["Alice", "Bob", "Charlie", "David", "Eva"]
candies = 1
for child in children:
    print(f"{child} receives {candies} candies")
    candies += 1

# 5. You are processing a list of book titles. Use a for loop to print each title in upperca
book_titles = ["To Kill a Mockingbird", "1984", "Moby Dick", "The Great Gatsby"]
for title in book_titles:
    print(title.upper())

# 6. You are counting items in a warehouse. Use a for loop to skip printing the count for th
items = ["item1", "item2", "defective", "item3", "item4"]
count = 0
for item in items:
    if item == "defective":
        continue
    count += 1
    print(f"Count for {item}: {count}")

# 7. You are programming a countdown timer. Write a while loop to print the countdown from 1
countdown = 10
while countdown >= 0:
    print(countdown)
    countdown -= 1

# 8. You are analyzing sales data. Use a for loop to find and print the highest sale amount
sales_figures = [250, 400, 300, 450, 500]
highest_sale = 0
for sale in sales_figures:
```

```
    if sale > highest_sale:
        highest_sale = sale
print("Highest sale amount:", highest_sale)

# 9. You are creating a sequence of special offers. Use a for loop to generate and print the
fibonacci = [0, 1]
for i in range(2, 10):
    fibonacci.append(fibonacci[-1] + fibonacci[-2])
for offer in fibonacci:
    print("Special offer:", offer)

# 10. You are maintaining a guest list. Use a for loop to print each guest's name, but stop
guest_list = ["John", "Jane", "VIP", "Alice", "Bob"]
for guest in guest_list:
    if guest == "VIP":
        break
    print(guest)

# 11. You are designing a game where players' names are stored in a string. Use a while loop
players = "Alice Bob Charlie"
i = len(players) - 1
while i >= 0:
    print(players[i], end="")
    i -= 1
print()

# 12. You are calculating class averages. Use a for loop to calculate and print the average
grades = [88, 92, 79, 85, 90]
total = 0
```