perplexity

genrate me a practice coding sheet of pyhton from topics like print till if else condtionals included make sure it ahs all level of problems make 20 - 30 questions on them make the last 10 super critical thinking ones note that each question should help me improve my skill

Now I'll create the practice coding sheet for Python covering topics from print statements to if-else conditionals with varying difficulty levels.

Python Practice Coding Sheet: Print to If-Else Conditionals

Instructions

- Each question is designed to build your Python skills progressively
- Start with the easier questions and work your way up
- The last 10 questions are critical thinking problems that will challenge your problem-solving abilities
- Try to solve each problem on your own before looking up solutions

BEGINNER LEVEL (Questions 1-8)

1. Hello World

Write a Python program that prints "Hello, World!" to the screen.

2. Multiple Print Statements

Write a program that prints your name on the first line, your age on the second line, and your favorite hobby on the third line.

3. Print with Different Separators

Write a program that prints three words separated by dashes instead of spaces using the `sep` parameter.

4. Print Without Newline

Write a program that prints "Python" and "Programming" on the same line with a space between them using the `end` parameter.

5. Variable Assignment and Print

Create variables to store your first name, last name, and print them together as a full name.

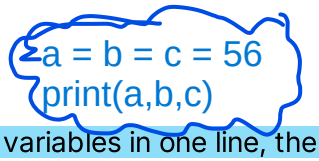
6. Number Variables

Create variables to store two numbers, calculate their sum, and print the result with a descriptive message.

7. String and Number Together

Create a variable for your age (as a number) and your name (as a string), then print them in a sentence like "My name is [name] and I am [age] years old."

8. Multiple Variable Assignment



Assign the same value (your favorite number) to three different variables in one line, then print all three.

INTERMEDIATE LEVEL (Questions 9-18)

9. Simple If Statement

Write a program that checks if a number is positive and prints "The number is positive" if true.

10. If-Else Statement

Write a program that checks if a number is even or odd and prints the appropriate message.

11. Age Category

Write a program that takes a person's age and prints whether they are a "child" (under 18), "adult" (18-64), or "senior" (65 and above).

12. Temperature Check

Write a program that takes a temperature in Celsius and prints whether it's "freezing" (below 0), "cold" (0-15), "moderate" (16-25), or "hot" (above 25).

13. Grade Calculator

Write a program that takes a numerical score (0-100) and prints the letter grade: A (90-100), B (80-89), C (70-79), D (60-69), F (below 60).

14. Leap Year Checker

Write a program that checks if a given year is a leap year. A year is a leap year if it's divisible by 4, except for years divisible by 100 (unless also divisible by 400).

15. Number Comparison

Write a program that takes three numbers and prints which one is the largest.

16. Login System

Create a simple login system that checks if the entered username is "admin" and password is "python123". Print appropriate success or failure messages.

17. Triangle Type

Write a program that takes three sides of a triangle and determines if it's "equilateral" (all sides equal), "isosceles" (two sides equal), or "scalene" (no sides equal).

18. BMI Calculator with Categories

Calculate BMI (weight in kg / (height in meters)²) and categorize it: Underweight (<18.5), Normal (18.5-24.9), Overweight (25-29.9), Obese (≥30).

ADVANCED LEVEL (Questions 19-20)

19. Nested Conditions - Scholarship Eligibility

Write a program that determines scholarship eligibility based on:

- GPA must be ≥ 3.5
- Family income must be < $50,000
- Student must be enrolled full-time (boolean)
  Print detailed eligibility status with reasons.

20. Complex Number Classification

Write a program that takes a number and classifies it using multiple conditions:

- Positive/Negative/Zero
- Even/Odd (if not zero)
- Prime/Composite (if positive and greater than 1)
- Perfect square (if positive)

CRITICAL THINKING PROBLEMS (Questions 21-30)

21. Smart Calculator

Create a program that takes two numbers and an operator (+, -, *, /, %) and performs the calculation. Handle division by zero and invalid operators with appropriate error messages.

22. Password Strength Checker

Write a program that evaluates password strength based on:

- Length (minimum 8 characters)
- Contains uppercase and lowercase letters
- Contains at least one digit
- Contains at least one special character
  Rate as "Weak", "Medium", or "Strong".

23. Time Format Converter

Write a program that converts 24-hour format to 12-hour format (with AM/PM). Handle edge cases like midnight (00:00) and noon (12:00).

24. Rock, Paper, Scissors Logic

Create the logic for a Rock, Paper, Scissors game. Take two inputs (player choices) and determine the winner or if it's a tie, with detailed explanations.

25. Quadratic Equation Solver

Write a program that solves quadratic equations ($ax^2 + bx + c = 0$). Handle all cases:

- Two real solutions
- One real solution
- No real solutions (complex)
- Invalid input (a = 0)

26. Bank Account Validator

Create a program that validates bank account transactions:

- Check if account balance is sufficient for withdrawal
- Apply different fees based on account type (savings: no fee, checking: $2 fee for overdraft)
- Handle minimum balance requirements
- Print detailed transaction summary

27. Tax Calculator with Multiple Brackets

Create a progressive tax calculator:

- 0% on income up to $10,000
- 10% on income from $10,001 to $40,000
- 22% on income from $40,001 to $85,000
- 24% on income above $85,000
  Calculate total tax and effective tax rate.

28. Smart Traffic Light System

Design a traffic light system that decides the light color based on:

- Time of day (rush hour vs normal)
- Traffic density (high, medium, low)
- Emergency vehicle presence
- Pedestrian crossing request
  Output the appropriate light color and duration.

29. Employee Bonus Calculator

Calculate employee bonus based on multiple criteria:

- Performance rating (1-5 scale)
- Years of service
- Department (Sales gets 20% extra, Tech gets 15% extra)
- Company profit margin this year
  Include different bonus tiers and cap limits.

30. Airline Ticket Pricing System

Create a dynamic pricing system for airline tickets considering:

- Base price varies by destination
- Season (peak/off-peak) affects pricing
- Days until departure (last-minute surcharge)
- Seat class (economy/business/first)
- Customer loyalty tier
- Current demand (high demand = higher price)
  Calculate final price with breakdown of all factors.

Tips for Success:

1. **Start Simple**: Begin with basic print statements and gradually add complexity
2. **Test Edge Cases**: Always consider unusual inputs (negative numbers, zero, empty strings)
3. **Use Descriptive Variables**: Make your code readable with meaningful variable names
4. **Comment Your Logic**: Especially for complex conditions, explain your thinking
5. **Debug Systematically**: If something doesn't work, check each condition step by step
6. **Practice Daily**: Try to solve 2-3 problems daily to build consistency
7. **Think Before Coding**: Plan your logic on paper before writing code
8. **Learn from Mistakes**: Each error is a learning opportunity

Skills You'll Develop:

- **Print Function Mastery**: Different ways to format and display output
- **Variable Management**: Creating, assigning, and manipulating variables
- **Conditional Logic**: Building complex decision-making structures
- **Problem Decomposition**: Breaking complex problems into smaller parts
- **Edge Case Handling**: Anticipating and managing unusual scenarios
- **Code Organization**: Writing clean, readable, and maintainable code
- **Debugging Skills**: Identifying and fixing logical errors
- **Critical Thinking**: Approaching problems methodically and creatively

Remember: Programming is about solving problems step by step. Don't rush through the questions – take time to understand each concept thoroughly before moving to the next level!