🎯 Day 2 – Conditions & Logic

🧩 Core Concept Focus

- Conditional statements (`if` , `else if` , `else`)
- Comparison and logical operators
- Decision making based on different inputs
- Strengthening flow-of-control understanding

🧠 Questions List

1. **Find the Maximum of Three Numbers**
    - Input: `10 20 5`
    - Output: `20`
    - ✨ *Teaches nested or chained conditional logic and comparative reasoning.*

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2. **Check if a Number is Positive, Negative, or Zero**
    - Input: `-9`
    - Output: `Negative`
    - ✨ *Practices multi-branch conditions and comparison operators.*

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3. **Calculate Electricity Bill**

- Input: `Units = 230`
- Output: `Total Bill = ₹1500`
- ✨ *Applies multiple ranges using chained* `else if` *and cumulative logic.*
- Example Logic:
    - 0–100 units → ₹5 per unit
    - 101–200 units → ₹7 per unit
    - 201–300 units → ₹10 per unit
    - Above 300 units → ₹12 per unit
- 🔍 *Teaches:* cumulative calculation + condition chaining.

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4. **Check if a Character is a Vowel or Consonant**

   - Input: `e`
   - Output: `Vowel`
   - ✨ *Combines logical OR (`||`) operator and string comparisons.*

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5. **Check if a Year is a Leap Year**

   - Input: `2024`
   - Output: `Leap Year`
   - ✨ *Builds compound condition logic using multiple `if` statements (`%4`, `%100`, `%400`).*

   A year is a **leap year** if it satisfies these conditions:

   1. It is **divisible by 4**,
      ➜ `year % 4 === 0`
   2. **But not divisible by 100**,
      ➜ `year % 100 !== 0`
   3. **Unless** it is also **divisible by 400**,
      ➜ `year % 400 === 0`

   🧩 **In Simple Words**

   - If a year is divisible by **4**, it's a leap year.
   - **Except** if it's also divisible by **100**, then it's **not** a leap year.
   - **But** if it's divisible by **400**, it **is** a leap year again.

🏠 Homework / Practice Challenge

1. **Check if a Character is Uppercase, Lowercase, Digit, or Special Character**

   - Input: `A`
   - Output: `Uppercase Letter`
   - ✨ *Teaches use of character code ranges (`charCodeAt`) and compound logical conditions.*
   - 🔍 *Concepts:* ASCII range checks, compound `&&` and `||` operators.

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2. **Check Triangle Type Using Sides and Angles**

- **Input:** `Sides = 3, 4, 5`
- **Output:** `Right-Angled Triangle`

- ✨ *Combines geometric reasoning + Pythagoras theorem check.*
- Example Logic:
  - If `a² + b² = c²` → Right-angled
  - Else if all sides equal → Equilateral
  - Else if any two equal → Isosceles
  - Else → Scalene

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3. **Calculate Income Tax Based on Slabs**

- **Input:** `Income = ₹7,50,000`
- **Output:** `Tax = ₹62,500`
- ✨ *Applies progressive slab logic similar to electricity bill but with financial context.*
- Example Logic (example slabs):
  - Up to ₹2,50,000 → No tax
  - ₹2,50,001 – ₹5,00,000 → 5%
  - ₹5,00,001 – ₹10,00,000 → 20%
  - Above ₹10,00,000 → 30%
- 🔍 *Requires cumulative calculation using nested* `if-else` *or multiple slab loops.*