🎯 Day 3 – Loops & Patterns

🧩 Core Concept Focus

- Nested Loops
- Pattern Printing with Logic and Symmetry
- Understanding iteration depth for shapes and designs

🧠 Questions List

1. **Print Right-Angled Star Triangle**

   - Input: `Rows = 5`

   - Output:

     ```
     *
     * *
     * * *
     * * * *
     * * * * *
     ```

   - ✨ *Teaches nested loops and increasing sequence printing.*

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2. **Print Inverted Right-Angled Triangle**

   - Input: `Rows = 5`

   - Output:

     ```
     * * * * *
     * * * *
     * * *
     * *
     *
     ```

   - ✨ *Reinforces decreasing nested loop structure.*

---

3. **Print Pyramid Pattern**

- Input: `Rows = 5`

- Output:

```
        *
      * * *
    * * * * *
  * * * * * * *
* * * * * * * * *
```

- ✨ *Teaches alignment using spaces and nested loops.*

---

4. **Print Inverted Pyramid Pattern**

- Input: `Rows = 5`

- Output:

```
* * * * * * * * *
  * * * * * * *
    * * * * *
      * * *
        *
```

- ✨ *Teaches reverse space-star pattern alignment.*

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5. **Print Hollow Square Pattern**

- Input: `Rows = 5`

- Output:

```
* * * * *
*       *
*       *
*       *
* * * * *
```

- ✨ *Practices conditional printing within nested loops.*

---

6. **Print Hollow Pyramid Pattern**

- Input: `Rows = 5`

- Output:

```
        *
      *   *
    *       *
   *           *
  * * * * * * * *
```

- ✨ *Combines conditionals and symmetrical logic in loops.*

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7. **Print Alternating Binary Triangle**

- Input: `Rows = 5`

- Output:

```
1
0 1
1 0 1
0 1 0 1
1 0 1 0 1
```

- ✨ *Combines parity logic with nested loops.*

🏠 Homework / Practice Challenge

1. **Print Hollow Inverted Pyramid**

- Input: `Rows = 5`

- Output:

```
* * * * * * * *
 *         *
  *       *
   *   *
    *
```

- ✨ *Focuses on conditionally printing edges and spaces.*

---

2. **Print Butterfly Pattern**

- Input: `Rows = 5`

- Output:

```
   *           *
  * *         * *
 * * *       * * *
* * * *     * * * *
* * * * * * * * * *
* * * *     * * * *
 * * *       * * *
  * *         * *
   *           *
```

- ✨ *Combines multiple sections with symmetry logic.*

---

3. **Print Diamond Pattern**

- Input: `Rows = 3`

- Output:

```
    *
   * * *
  * * * * *
   * * *
    *
```

- ✨ *Combines upper and lower pyramid logic for symmetry.*

---

4. **Print Hourglass Pattern**

- Input: `Rows = 5`

- Output:

```
* * * * * * * * *
 * * * * * * *
  * * * * *
   * * *
    *
   * * *
  * * * * *
 * * * * * * *
* * * * * * * * *
```

- ✨ *Practices combining inverse loops and symmetrical shapes.*

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5. Print Hollow Diamond Pattern

- Input: `Rows = 3`

- Output:

```
    *
   * *
  *   *
   * *
    *
```

- ✨ *Teaches combining upward and downward hollow pyramids.*

---

6. Print Rhombus Pattern

- Input: `Rows = 5`

- Output:

```
    * * * * *
   * * * * *
  * * * * *
 * * * * *
* * * * *
```

- ✨ *Practices offset alignment for uniform patterns.*

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7. Print Multiplication Table (Single and Upto N)

- Input 1: `Number = 5`

- Output:

```
5 x 1 = 5
5 x 2 = 10
...
5 x 10 = 50
```

- Input 2: `Upto = 3`

- Output:

```
Table of 1
1 x 1 = 1
...
```

```
Table of 3
3 x 10 = 30
```

- ✨ *Practices simple and nested loops for repetitive operations.*