Programming Basics Notes

1. For Loops:
- Used for repeating tasks a fixed number of times.
- Syntax: for (let i = 0; i < n; i++) { } (JavaScript)
- Each iteration executes code block; new console.log() adds a new line.

2. Printing Star Patterns:
Example (JS): for (let i = 1; i <= n; i++) console.log("* ".repeat(i));
→ Each iteration prints stars on a new line.

3. for...in vs for...of:
- for...in: Iterates over property names (keys).
- for...of: Iterates over values (elements).
Example:
for (let i in arr) → gives indexes
for (let i of arr) → gives values

4. Common Coding Tasks:
- Find remainder → a % b
- Odd/Even → num % 2 == 0
- Sum of digits → extract digits using num % 10
- Largest among n numbers → track max variable
- Grade calculation → use if-else or switch-case
- Fibonacci → loop adding previous two numbers
- Reverse string → str.split('').reverse().join('')
- Capitalize words → str.replace(/■\w/g, c => c.toUpperCase())
- Prime number → check divisibility up to √n
- Leap year → year % 4 == 0 && (year % 100 != 0 || year % 400 == 0)
- Palindrome → same forward & backward
- Isogram → no repeating letters
- Character frequency → use Map/Object counting chars