Challenge Report – Off by a Bit

Category: Forensics
Difficulty: Medium
Flag: ClawCTF{f0r3ns1cs_1s_fun_2_pl4y}

Overview
This challenge provides a single image containing red binary digits on a dark background. At first glance, the binary appears random, but closer inspection reveals the text “CLAWCTF” embedded faintly in the background, indicating hidden data.

Step 1: Visual Analysis
The presence of repeated binary patterns suggests encoded information. The hidden “CLAWCTF” text confirms the challenge branding and hints that the binary contains a flag.

Step 2: Binary Extraction
Using OCR tools or image contrast enhancement, the binary digits are extracted from the image into a continuous binary string.

Step 3: Initial Decoding Attempt
Direct ASCII decoding of the binary fails, producing unreadable output. This indicates that the binary is not aligned to standard 8-bit boundaries.

Step 4: Known-Plaintext Technique
CTF flags often follow predictable formats. Here, the expected prefix “ClawCTF{” is converted into binary and searched for within the extracted data.

Step 5: Bit Alignment
The binary stream is shifted bit-by-bit and decoded at each position. Once proper alignment is achieved, the flag becomes readable.

Final Result
The correctly aligned binary decodes to the following flag:
ClawCTF{f0r3ns1cs_1s_fun_2_pl4y}

Conclusion
This challenge tests visual forensics, binary analysis, and logical reasoning. The misaligned binary ensures that only careful analysis reveals the correct solution.