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| **Experiment No: 6** | |
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| **Name** | Suyash Tambe |
| **PRN** | 22070126117 |
| **Date of**  **Performance** |  |
|  | |
| **Title** | [write\_a\_program\_to\_generate\_crc\_code\_for\_checking\_error](https://lms.sitpune.edu.in/pluginfile.php/21403/mod_assign/introattachment/0/cn_experiment_6_write_a_program_to_generate_crc_code_for_checking_error.py?forcedownload=1) |
| **Theory (short)** | Modulo 2 binary division is an important operation in digital communications and computer science, especially in error detection and correction algorithms such as CRC (Cyclic Redundancy Check). Binary division, unlike traditional division, follows the laws of modulo 2 arithmetic, simplifying the operation by eliminating the need for carries or borrows. This type of division only uses bitwise XOR operations, making it efficient and appropriate for hardware implementations. |
| **Procedure** | NA |
| **Output**  **Screenshots** |  |

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| **Observation** | The observations surrounding modulo 2 binary division underscore its pivotal role in digital systems, particularly in areas requiring efficient and reliable error detection. Its simplicity and deterministic nature make it an attractive choice for hardware implementations, while its mathematical robustness ensures its continued relevance in advanced coding and cryptographic applications. Understanding these observations provides valuable insights into both the theoretical underpinnings and practical implementations of modulo 2 binary division. |
| **Self-**  **assessment Q&A** | NA |
| **Conclusion** | Modulo 2 binary division is a simple and effective way to divide binary integers, particularly in the context of digital communication networks. Its dependency on XOR operations makes it excellent for hardware implementation and applications that need error detection, such as CRC. Understanding the physics of this division approach is critical for developing reliable communication protocols and digital systems. |

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