**Subject: PRF192**

**Workshop 01**

**Exercise 1: Convert decimal numbers to binary ones**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Decimal** | **Binary 4-bit** | **Decimal** | **Binary**  **8-bit (1byte)** | **Decimal** | **Binary**  **16-bit (2byte)** |
| 7 | 0111 | 7 | 0000 0111 | 192 | 00000000 11000000 |
| 13 | 1101 | 34 | 0001 0010 | 312 | 00000001 00111000 |

**A screenshot of a computer

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**Exercise 2: Convert decimal numbers to binary and hexadecimal ones**

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|  |  |  |  |
| --- | --- | --- | --- |
| **Decimal** | **Binary**  **8 bit** | **Octal** | **Hexa.** |
| 23 | 00010111 | 27 | 17 |
| 28 | 0001 1100 | 34 | 1C |
| 51 | 0011 0011 | 63 | 33 |
| 46 | 0010 1110 | **56** | 2E |
|  | 0100 1101 | 115 | 4D |
|  | 1000 0101 | 205 | 85 |
|  | 1100 0111 | **307** | C7 |

**Exercise 3: Compute two binary numbers**

0110 1010 + 0000 1111 = **0111 1001**

1101 1011 - 1011 0111= **0010 0100**16378 d / 215 d = 76,17 d ->76 d

**Exercise 4: Show binary formats of 1-byte signed numbers**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Negative integer  (Số nguyên âm) | Positive integer  (Số nguyên dương) | Sign-and-magnitude representation  (Dấu lượng) | One's complement  (Bù 1) | Two’s complement  (Bù 2) |
| **-51** | 51 = 0011 0011 | -51 = 1011 0011 | -51 = 1100 1100 | -51=1100 1101 |
| **-117** | 117 = 0111 0101 | -117 = 1111 0101 | -117 = 1000 1010 | -117 = 1000 1011 |
| **-20** | 20 = 0001 0100 | -20 = 1001 0100 | -20 = 1110 1011 | -20 = 1110 1100 |

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