Assignment 2

1. Q1
   1. Decimal
      1. 1100112 = 5110
   2. Decimal(Signed)
      1. 001100+1=001101=13
      2. 110011signed integer binary = -13
   3. Hexadecimal
      1. 1100112 = 3316
   4. ASCII
      1. 1100112 -> 5110 -> 3ASCII
2. Q2
3. Q3
4. Q4
   1. A)

|  |  |  |  |
| --- | --- | --- | --- |
| * + 1. A | * + 1. B | * + 1. C | * + 1. OUTPUT |
| * + 1. 0 | * + 1. 0 | * + 1. 0 | * + 1. 0 |
| * + 1. 0 | * + 1. 0 | * + 1. 1 | * + 1. 0 |
| * + 1. 0 | * + 1. 1 | * + 1. 0 | * + 1. 0 |
| * + 1. 0 | * + 1. 1 | * + 1. 1 | * + 1. 1 |
| * + 1. 1 | * + 1. 0 | * + 1. 0 | * + 1. 0 |
| * + 1. 1 | * + 1. 0 | * + 1. 1 | * + 1. 1 |
| * + 1. 1 | * + 1. 1 | * + 1. 0 | * + 1. 1 |
| * + 1. 1 | * + 1. 1 | * + 1. 1 | * + 1. 0 |

* 1. B)This expression essentially says that check if only two of the three inputs are true, if all three are true return false.

1. Q5
   1. The first proof is that you could use a truth table. Both expressions have the following truth table

|  |  |  |  |
| --- | --- | --- | --- |
| * + 1. X | * + 1. Y | * + 1. Z | * + 1. OUTPUT |
| * + 1. 0 | * + 1. 0 | * + 1. 0 | * + 1. 1 |
| * + 1. 0 | * + 1. 0 | * + 1. 1 | * + 1. 1 |
| * + 1. 0 | * + 1. 1 | * + 1. 0 | * + 1. 1 |
| * + 1. 0 | * + 1. 1 | * + 1. 1 | * + 1. 0 |
| * + 1. 1 | * + 1. 0 | * + 1. 0 | * + 1. 0 |
| * + 1. 1 | * + 1. 0 | * + 1. 1 | * + 1. 1 |
| * + 1. 1 | * + 1. 1 | * + 1. 0 | * + 1. 1 |
| * + 1. 1 | * + 1. 1 | * + 1. 1 | * + 1. 1 |

* 1. You can also then prove this by using basic logic
     1. (X+Y) is XNOR
     2. (Z\*Y) is XOR