

Homework Assignment 1 Answered

Unsigned Binary → Decimal (convert to decimal)

1. $1011 \Rightarrow (1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (1 \times 2^0)$

$$\Rightarrow 8 + 0 + 2 + 1$$

$$\Rightarrow 11$$

2. $11010 \Rightarrow (1 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$

$$\Rightarrow 16 + 8 + 0 + 2 + 0$$

$$\Rightarrow 26$$

3. $111111 \Rightarrow (1 \times 2^5) + (1 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0)$

$$\Rightarrow 32 + 16 + 8 + 4 + 2 + 1$$

$$\Rightarrow 63$$

4. $100000 \Rightarrow (1 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (0 \times 2^0)$

$$\Rightarrow 32 + 0 + 0 + 0 + 0 + 0$$

$$\Rightarrow 32$$

5. $1010101 \Rightarrow (1 \times 2^6) + (0 \times 2^5) + (1 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$

$$\Rightarrow 64 + 0 + 16 + 0 + 4 + 0 + 1$$

$$\Rightarrow 85$$

6. $111000 \Rightarrow (1 \times 2^5) + (1 \times 2^4) + (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (0 \times 2^0)$

$$\Rightarrow 32 + 16 + 8 + 0 + 0 + 0$$

$$\Rightarrow 56$$

7. $1001 \Rightarrow (1 \times 2^3) + (0 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$

$$\Rightarrow 8 + 0 + 0 + 1$$

$$\Rightarrow 9$$

$$8. \quad 1100110 \Rightarrow (1 \times 2^6) + (1 \times 2^5) + (0 \times 2^4) + (0 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (0 \times 2^0)$$

$$\Rightarrow 64 + 32 + 0 + 0 + 4 + 2 + 0$$

$$\Rightarrow 102$$

$$9. \quad 1111 \Rightarrow (1 \times 2^3) + (1 \times 2^2) + (1 \times 2^1) + (1 \times 2^0)$$

$$\Rightarrow 8 + 4 + 2 + 1$$

$$\Rightarrow 15$$

$$10. \quad 1001101 \Rightarrow (1 \times 2^6) + (0 \times 2^5) + (0 \times 2^4) + (1 \times 2^3) + (1 \times 2^2) + (0 \times 2^1) + (1 \times 2^0)$$

$$\Rightarrow 64 + 0 + 0 + 8 + 4 + 0 + 1$$

$$\Rightarrow 76$$

Decimal \rightarrow Unsigned Binary (convert to binary)

1. 9

Division	Quotient	Remainder
9/2	4	1
4/2	2	0
2/2	1	0
1/2	0	1

Answer = 1001

2. 14

Division	Quotient	Remainder
14/2	7	0
7/2	3	1
3/2	1	1
1/2	0	1

Answer = 1110

3. 27

Division	Quotient	Remainder
27/2	13	1
13/2	6	1
6/2	3	0
3/2	1	1
1/2	0	1

Answer = 11011

4. 32

Division	Quotient	Remainder
32/2	16	0
16/2	8	0
8/2	4	0
4/2	2	0
2/2	1	0
1/2	0	1

Answer = 100000

5. 45

Division	Quotient	Remainder
45/2	22	1
22/2	11	0
11/2	5	1
5/2	2	1
2/2	1	0
1/2	0	1

Answer = 101101

6. 58

Division	Quotient	Remainder
58/2	29	0
29/2	14	1
14/2	7	0
7/2	3	1
3/2	1	1
1/2	0	1

Answer = 111010

7. 73

Division	Quotient	Remainder
73/2	36	1
36/2	18	0
18/2	9	0
9/2	4	1
4/2	2	0
2/2	1	0
1/2	0	1

Answer = 1001001

8. 85

Division	Quotient	Remainder
85/2	42	1
42/2	21	0
21/2	10	1
10/2	5	0
5/2	2	1
2/2	1	0
1/2	0	1

Answer = 1010101

9. 100

Division	Quotient	Remainder
100/2	50	0
50/2	25	0
25/2	12	1
12/2	6	0
6/2	3	0
3/2	1	1
1/2	0	1

Answer = 1100100

10. 127

Division	Quotient	Remainder
127/2	63	1
63/2	31	1
31/2	15	1
15/2	7	1
7/2	3	1
3/2	1	1
1/2	0	1

Answer = 1111111

Decimal → Unsigned Octal (convert to octal)

1. 8

Division	Quotient	Remainder
8/8	1	0
1/8	0	1

Answer = 10

2. 15

Division	Quotient	Remainder
15/8	1	7
1/8	0	1

3. 20

Division	Quotient	Remainder
20/8	2	4
2/8	0	2

Answer = 24

4. 33

Division	Quotient	Remainder
33/8	4	1
4/8	0	4

Answer = 41

5. 40

Division	Quotient	Remainder
40/8	5	0
5/8	0	5

Answer = 50

6. 56

Division	Quotient	Remainder
56/8	7	0
7/8	0	7

Answer = 70

7. 72

Division	Quotient	Remainder
72/8	9	0
9/8	1	1
1/8	0	1

Answer = 110

8. 88

Division	Quotient	Remainder
88/8	11	0
11/8	1	3
1/8	0	1

Answer = 130

9. 99

Division	Quotient	Remainder
99/8	12	3
12/8	1	4
1/8	0	1

Answer = 143

10. 120

Division	Quotient	Remainder
120/8	15	0
15/8	1	7
1/8	0	1

Answer = 170

Unsigned Octal → Decimal (convert to decimal)

1. $7 \Rightarrow (7 \times 8^0)$

$$\Rightarrow 7$$

2. $12 \Rightarrow (1 \times 8^1) + (2 \times 8^0)$

$$\Rightarrow 8 + 2$$

$$\Rightarrow 10$$

$$3. \quad 25 \Rightarrow (2 \times 8^1) + (5 \times 8^0)$$

$$\Rightarrow 16 + 5$$

$$\Rightarrow 21$$

$$4. \quad 31 \Rightarrow (3 \times 8^1) + (1 \times 8^0)$$

$$\Rightarrow 24 + 1$$

$$\Rightarrow 25$$

$$5. \quad 44 \Rightarrow (4 \times 8^1) + (4 \times 8^0)$$

$$\Rightarrow 32 + 4$$

$$\Rightarrow 36$$

$$6. \quad 57 \Rightarrow (5 \times 8^1) + (7 \times 8^0)$$

$$\Rightarrow 40 + 7$$

$$\Rightarrow 47$$

$$7. \quad 101 \Rightarrow (1 \times 8^2) + (0 \times 8^1) + (1 \times 8^0)$$

$$\Rightarrow 64 + 0 + 1$$

$$\Rightarrow 65$$

$$8. \quad 132 \Rightarrow (1 \times 8^2) + (3 \times 8^1) + (2 \times 8^0)$$

$$\Rightarrow 64 + 24 + 2$$

$$\Rightarrow 90$$

$$9. \quad 205 \Rightarrow (2 \times 8^2) + (0 \times 8^1) + (5 \times 8^0)$$

$$\Rightarrow 128 + 0 + 5$$

$$\Rightarrow 133$$

$$10. 317 \Rightarrow (3 \times 8^2) + (1 \times 8^1) + (7 \times 8^0)$$

$$\Rightarrow 192 + 8 + 7$$

$$\Rightarrow 207$$

Decimal → Unsigned Hexadecimal (convert to hexadecimal)

Decimal	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

1. 10

Division	Quotient	Remainder
10/16	0	A

Answer = A

2. 15

Division	Quotient	Remainder
15/16	0	F

Answer = F

3. 26

Division	Quotient	Remainder
26/16	1	A
1/16	0	1

Answer = 1A

4. 31

Division	Quotient	Remainder
31/16	1	F
1/16	0	1

Answer = 1F

5. 47

Division	Quotient	Remainder
47/16	2	F
2/16	0	2

6. 60

Division	Quotient	Remainder
60/16	3	C
3/16	0	3

Answer = 3C

7. 75

Division	Quotient	Remainder
76/16	4	C
4/16	0	4

Answer = 4C

8. 99

Division	Quotient	Remainder
99/16	5	3
5/16	0	5

Answer = 53

9. 120

Division	Quotient	Remainder
120/16	7	8
7/16	0	7

Answer = 78

10. 255

Division	Quotient	Remainder
255/16	15	F
15/16	0	F

Answer = FF

Unsigned Hexadecimal → Decimal (convert to decimal)

1. $A \Rightarrow (A \times 16^0)$

$$\Rightarrow 10 \times 1$$

$$\Rightarrow 10$$

2. $F \Rightarrow (F \times 16^0)$

$$\Rightarrow 15 \times 1$$

$$\Rightarrow 15$$

3. $1A \Rightarrow (1 \times 16^1) + (A \times 16^0)$

$$\Rightarrow (1 \times 16) + (10 \times 1)$$

$$\Rightarrow 16 + 10$$

$$\Rightarrow 26$$

4. $2F \Rightarrow (2 \times 16^1) + (F \times 16^0)$

$$\Rightarrow (2 \times 16) + (15 \times 1)$$

$$\Rightarrow 32 + 15$$

$$\Rightarrow 47$$

$$5. \quad 3C \Rightarrow (3 \times 16^1) + (C \times 16^0)$$

$$\Rightarrow (3 \times 16) + (12 \times 1)$$

$$\Rightarrow 48 + 12$$

$$\Rightarrow 60$$

$$6. \quad 4B \Rightarrow (4 \times 16^1) + (B \times 16^0)$$

$$\Rightarrow (4 \times 16) + (11 \times 1)$$

$$\Rightarrow 64 + 11$$

$$\Rightarrow 75$$

$$7. \quad 5D \Rightarrow (5 \times 16^1) + (D \times 16^0)$$

$$\Rightarrow (5 \times 16) + (13 \times 1)$$

$$\Rightarrow 80 + 13$$

$$\Rightarrow 93$$

$$8. \quad 6E \Rightarrow (6 \times 16^1) + (E \times 16^0)$$

$$\Rightarrow (6 \times 16) + (14 \times 1)$$

$$\Rightarrow 96 + 14$$

$$\Rightarrow 110$$

$$9. \quad 7F \Rightarrow (7 \times 16^1) + (F \times 16^0)$$

$$\Rightarrow (7 \times 16) + (15 \times 1)$$

$$\Rightarrow 112 + 15$$

$$\Rightarrow 127$$

$$10. \quad FF \Rightarrow (F \times 16^1) + (F \times 16^0)$$

$$\Rightarrow (15 \times 16) + (15 \times 1)$$

$$\Rightarrow 240 + 15$$

$$\Rightarrow 255$$