Decimal → Binary

100 ÷ 2 :	50	rem 0
50 ÷ 2 :	25	rem 0
25 ÷ 2 :	12	rem 1
12 ÷ 2 :	6	rem 0
6 ÷ 2 :	3	rem 0
3 ÷ 2 :	1	rem 1
1 ÷ 2 :	0	rem 1

⇒ **1100100**

59 ÷ 2 :	29	rem 1
29 ÷ 2 :	14	rem 1
14 ÷ 2 :	7	rem 0
7 ÷ 2 :	3	rem 1
3 ÷ 2 :	1	rem 1
1 ÷ 2 :	0	rem 1

⇒ **111011**

250 ÷ 2 :	125	rem 0
125 ÷ 2 :	62	rem 1
62 ÷ 2 :	31	rem 0
31 ÷ 2 :	15	rem 1
15 ÷ 2 :	7	rem 1
7 ÷ 2 :	3	rem 1
3 ÷ 2 :	1	rem 1
1 ÷ 2 :	0	rem 1

⇒ **11111010**

476 ÷ 2 :	238	rem 0
238 ÷ 2 :	119	rem 0
119 ÷ 2 :	59	rem 1
59 ÷ 2 :	29	rem 1
29 ÷ 2 :	14	rem 1
14 ÷ 2 :	7	rem 0
7 ÷ 2 :	3	rem 1
3 ÷ 2 :	1	rem 1
1 ÷ 2 :	0	rem 1

⇒ **111011100**

Binary to Decimal

1 1 0 0 0 1

$1 \times 2^0 = 1$
$0 \times 2^1 = 0$
$0 \times 2^2 = 0$
$0 \times 2^3 = 0$
$1 \times 2^4 = 16$
$1 \times 2^5 = 32$

$1 + 0 + 0 + 0 + 16 + 32 = 49$

1 0 0 0 0 0 1

$1 \times 2^0 = 1$
$0 \times 2^1 =$
$0 \times 2^2 =$
$0 \times 2^3 =$
$0 \times 2^4 =$
$0 \times 2^5 =$
$1 \times 2^6 = 64$

$1 + 64 = 65$

1 0 1 0 1 0 1 0 1 1

$1 \times 2^0 = 1$
$1 \times 2^1 = 2$
$0 \times 2^2 = 0$
$1 \times 2^3 = 8$
$0 \times 2^4 = 0$
$1 \times 2^5 = 32$
$0 \times 2^6 = 0$
$1 \times 2^7 = 128$
$0 \times 2^8 = 0$
$1 \times 2^9 = 512$

$1 + 2 + 8 + 32 + 128 + 512 = 683$

Decimal → Hexadecimal

1000 ÷ 16 = 62 rem 8

62 ÷ 16 = 3 rem 14

3 ÷ 16 = 0 rem 3

3, 14, 8 : **3E8** or 0x3E8

597 ÷ 16 = 37 rem 5

37 ÷ 16 = 2 rem 5

2 ÷ 16 = 0 rem 2

2, 5, 5 : **255** or 0x255

42678 ÷ 16 = 2667 rem 6

2667 ÷ 16 = 166 rem 11

166 ÷ 16 = 10 rem 6

10 ÷ 16 = 0 rem 10

10, 6, 11, 6 : **A6B6** or 0xA6B6

250 ÷ 16 = 15 rem 10

15 ÷ 16 = 0 rem 15

15, 10 : **FA** or 0xFA

Hexadecimal → Decimal

→ 1 4 E 3

$3 \times 16^0 = 16$

$14 \times 16^1 = 224$

$4 \times 16^2 = 1024$

$1 \times 16^3 = 4096$

5360

→ A 1 0 B

$11 \times 16^0 = 16$

$0 \times 16^1 = 0$

$1 \times 16^2 = 256$

$10 \times 16^3 = 40960$

41232

→ 1 0 0 0

$0 \times 16^0 = 0$

$0 \times 16^1 = 0$

$0 \times 16^2 = 0$

$1 \times 16^3 = 4096$

4096

→ 1 0 1 0

$0 \times 16^0 = 0$

$1 \times 16^1 = 16$

$0 \times 16^2 = 0$

$1 \times 16^3 = 4096$

4112

Binary

```
  1 1 0 0 0 1        49
+   1 1 0 1 1      + 27
-----------------------
1 0 0 1 1 0 0        76
```

```
    1 0 0 1 1 1 0      78
+       1 1 0 1    + 13
-------------------------
  1 0 1 1 0 1 1        91
```

Hex

```
2812
+277
3089
```

```
    A F C
+   1 1 5
---------
  C 1 1
```

C + 5 = 17. In hexadecimal form, this is '1 1'

1 + F + 1 = 17. again, '1 1'

1 + A + 1 = 12. In hex, this is C

```
3674
  +
2138
5812
```

```
    E 5 A
+   8 5 A
---------
1 6 B 4
```

A + A = 20. In hex: 14

1 + 5 + 5 = 11. In hex: B

E + 8 = 22. In hex: 16

```
353
 x3
1059
```

```
    3 5 3
x       3
---------
  9 F 9
```

3 x 3 = 9

3 x 5 = 15 or F