Number Bases

Chapter No.	6
Status	Completed

▼ Denary (Base 10)

- The digits 0 to 9 are used

▼ Example

4350 (Base 10)

Number in Base 10	10^3	10^2	10^1	10^0
4350	4	3	5	0

▼ Binary (Base 2)

- Only the digits 0 and 1 are used

▼ Example

- 1110 (Base 2) = (1 x 2^3) + (1 x 2^2) + (1 x 2^1) + (0 x 2^0) = 14 (Base 10)

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Number in Base 2	2^3	2^2	2^1	2^0
1110	1	1	1	0

▼ Hexadecimal (Base 16)

- The digits 0 to 9 and the letters A to F are used
- The letters A to F represent 10 (Base 10) to 15 (Base 10) respectively

▼ Example

- B07A (Base 16) = (11 x 16^3) + (0 x 16^2) + (7 x 16^1) + (10 x 2^0) = 45178 (Base 10)

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Number in Base 16	16^3	16^2	16^1	16^0
B07A	11	0	7	10

Converting Between Number Bases in Python

Converting to Denary

- int(<x>, <base>)
- Converts a string <x> which represents a number in a certain specified base into its denary equivalent
- <base> refers to the base in which the number represented by the string <x> is originally in

```
#converting the binary number x (string) to its denary equivalent
int(<x>, 2)

#converting the hexadecimal number x (string) to its denary equivalent
int(<x>, 16)
```

Converting from Denary to Binary

- bin(<x>)
- Returns a string of a binary number with the prefix "0b" which indicates that the string refers to a binary number

Converting from Denary to Hexadecimal

- hex(<x>)
- Returns a string of a hexadecimal number with the prefix "0x" which indicates that the string refers to a hexadecimal number