Mohammed Abu-Hadhoud
MBA, PMOC, PgMP®, PMP®, PMI-RMP®, CM, ITILF, MCPD, MCSD
26+ years of experience


مهم جداً
هذا الملف للمراجعة السريعة واخذ الملاحظات عليه فقط ،لانه يحتوي
على اقل من 20٪ مما يتم شرحه في الفيديوهات
الاستعجال والاعتماد عليه فقط سوف يجعلك تخسر كميه معلومات
وخبرات كثيره
يجب عليك مشاهدة فيديو الدرس كاملا
لاتنسى عمل لايك ومشاركة القناة لتعم الفائدة للجميع
لا تنسونا من دعائكم
ProgrammingAdvices.com
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اساسيات مهمه لكل مبرمج
النظام الثماني في الكمبيوتر
Octal System
8
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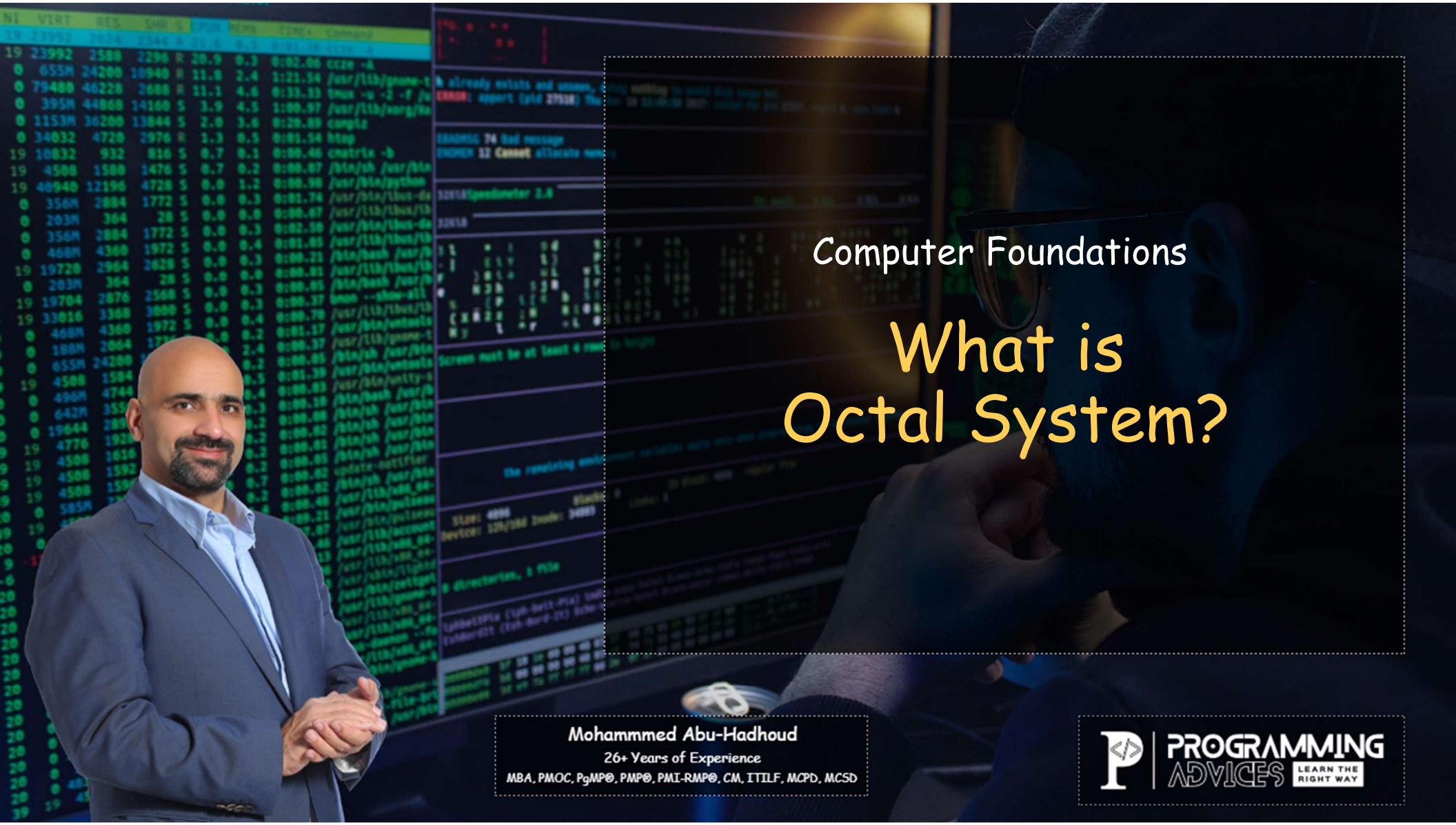
Computer Foundations
What is
Octal System?
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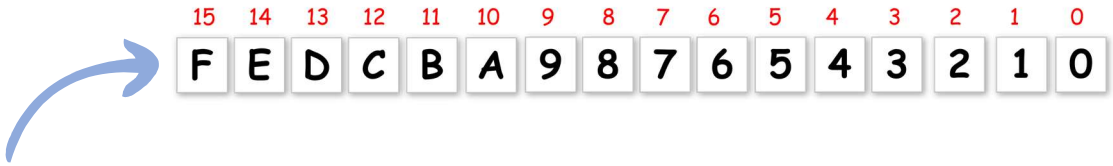
Counting Systems?

Decimal System (Base 10)

Binary System (Base 2)



Hexadecimal System (Base 16)

Octal System (Base 8)

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The **Octal Numbering System** is very similar in principle to the previous hexadecimal numbering system except that in Octal,

Each octal digit represents 3 bits, so a 6-bit byte is two octal digits

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ASCII Table

dec	hex	oct	char	dec	hex	oct	char	dec	hex	oct	char	dec	hex	oct	char
0	0	000	NULL	32	20	040	space	64	40	100	@	96	60	140	`
1	1	001	SOH	33	21	041	!	65	41	101	A	97	61	141	a
2	2	002	STX	34	22	042	"	66	42	102	B	98	62	142	b
3	3	003	ETX	35	23	043	#	67	43	103	C	99	63	143	c
4	4	004	EOT	36	24	044	$	68	44	104	D	100	64	144	d
5	5	005	ENQ	37	25	045	%	69	45	105	E	101	65	145	e
6	6	006	ACK	38	26	046	&	70	46	106	F	102	66	146	f
7	7	007	BEL	39	27	047	'	71	47	107	G	103	67	147	g
8	8	010	BS	40	28	050	(	72	48	110	H	104	68	150	h
9	9	011	TAB	41	29	051	)	73	49	111	I	105	69	151	i
10	a	012	LF	42	2a	052	*	74	4a	112	J	106	6a	152	j
11	b	013	VT	43	2b	053	+	75	4b	113	K	107	6b	153	k
12	c	014	FF	44	2c	054	,	76	4c	114	L	108	6c	154	l
13	d	015	CR	45	2d	055	-	77	4d	115	M	109	6d	155	m
14	e	016	SO	46	2e	056	.	78	4e	116	N	110	6e	156	n
15	f	017	SI	47	2f	057	/	79	4f	117	O	111	6f	157	o
16	10	020	DLE	48	30	060	0	80	50	120	P	112	70	160	p
17	11	021	DC1	49	31	061	1	81	51	121	Q	113	71	161	q
18	12	022	DC2	50	32	062	2	82	52	122	R	114	72	162	r
19	13	023	DC3	51	33	063	3	83	53	123	S	115	73	163	s
20	14	024	DC4	52	34	064	4	84	54	124	T	116	74	164	t
21	15	025	NAK	53	35	065	5	85	55	125	U	117	75	165	u
22	16	026	SYN	54	36	066	6	86	56	126	V	118	76	166	v
23	17	027	ETB	55	37	067	7	87	57	127	W	119	77	167	w
24	18	030	CAN	56	38	070	8	88	58	130	X	120	78	170	x
25	19	031	EM	57	39	071	9	89	59	131	Y	121	79	171	y
26	1a	032	SUB	58	3a	072	:	90	5a	132	Z	122	7a	172	z
27	1b	033	ESC	59	3b	073	;	91	5b	133	[	123	7b	173	{
28	1c	034	FS	60	3c	074	<	92	5c	134	\	124	7c	174	|
29	1d	035	GS	61	3d	075	=	93	5d	135	]	125	7d	175	}
30	1e	036	RS	62	3e	076	>	94	5e	136	^	126	7e	176	~
31	1f	037	US	63	3f	077	?	95	5f	137	_	127	7f	177	DEL

Why Octal?

- Previously in old computers the byte was only 6 digits not 8 digits.
- In octal a binary number is divided up into groups of only 3 bits, with each group or set of bits having a distinct value of between 000 and 111.
- The use of octal numbers **has declined now, why?!**

Because **most modern computers (use Nibbles) no longer base their word length** on multiples of three bits, (they are based on multiples of four bits, so hexadecimal is more widely used).

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It's hard for human to read binary!

What does this mean?

01001001 00100000 01001100 01101111 01110110 01100101
00100000 01011001 01101111 01110101 00100001

I Love You!

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Both Hexadecimal and Octal Systems
Provides a human-friendly representation

11010100 ➔ D4 Hexa

11010100 ➔ 212 Octal

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Octal Prefix
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Prefix:

Hexa Prefix:

Technology/Language	Prefix	Example
HTML & CSS	#Code	#FFFFFF
C,C++,Java..etc	0x Code	0x725
XML	&#Code	&#C2A4
Unicode	U+Code	U+C2A4

Octal Prefix:

OoCode ➔ Oo725

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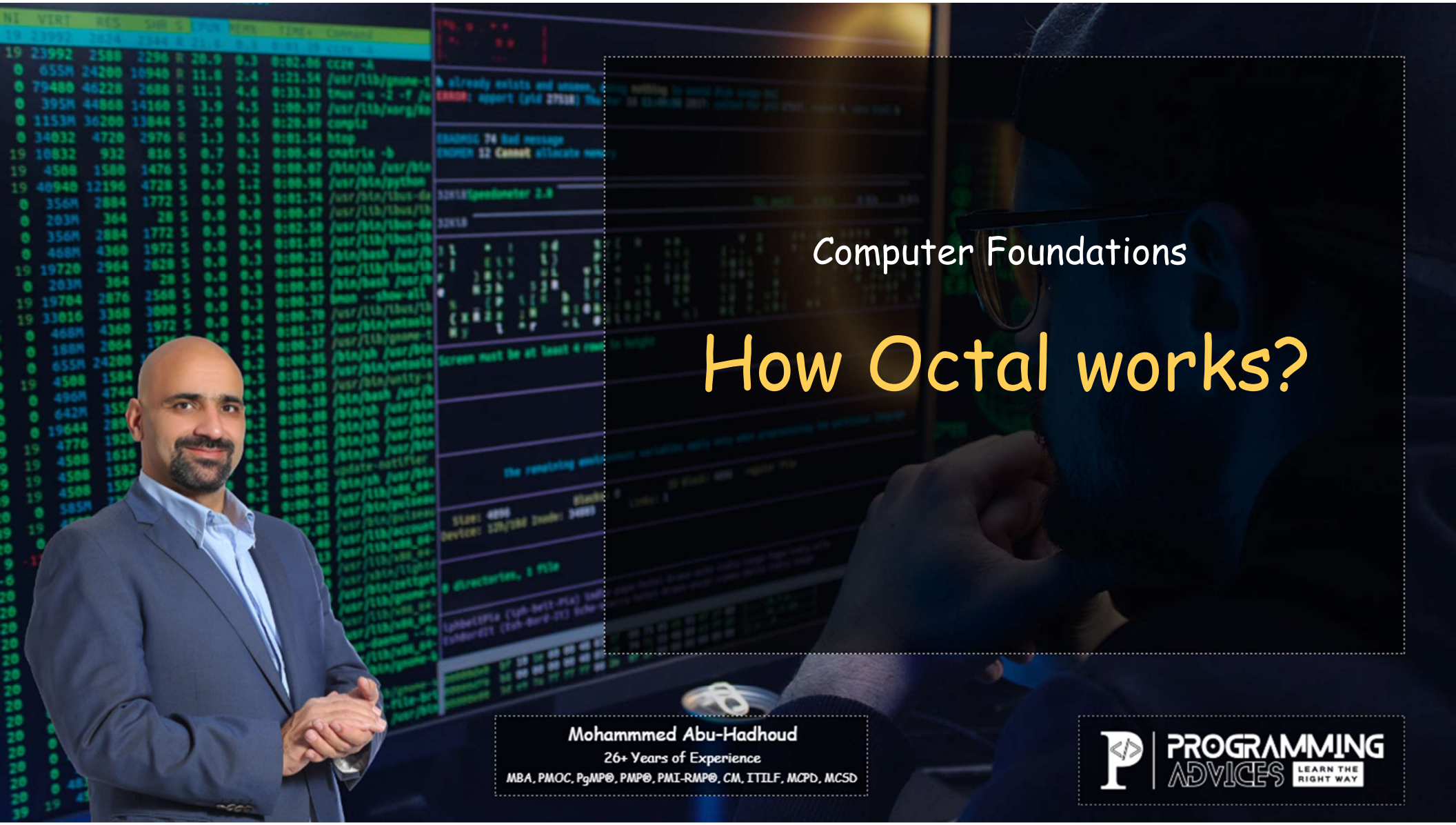
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How Octal works?
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Remember that binary was base 2.

2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	← Base 2
128	64	32	16	8	4	2	1	← Doubling

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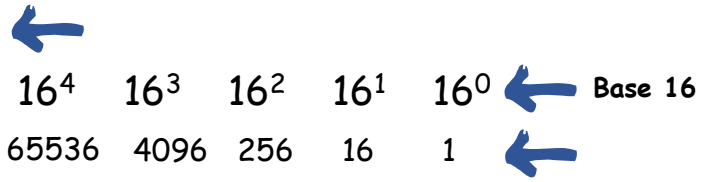
Hexadecimal is base 16.



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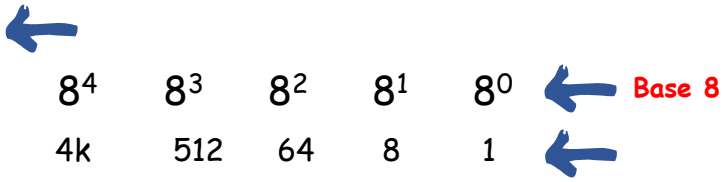
Octal System is base 8.



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Convert Decimal to Octal
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conversion from decimal to octal and binary to octal

Follows the same pattern as we have seen previously for hexadecimal

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Convert 469 to Octal

Number / 8	Result	Integer	Fraction	Remainder		Octal
469 / 8 =	58.625	58	0.625	8 x 0.625 =	5	5
58 / 8 =	7.25	7	0.25	8 x 0.25 =	2	2
7/8 =	--	--	--		7	7

$469_{10} \rightarrow 725_{8}$

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Convert Oct to Decimal.
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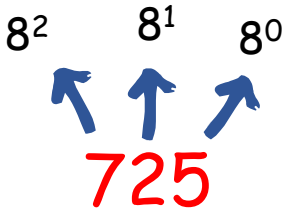
Convert Octal 725 to Decimal



$$5 \times 8^0 = 5 \times 1 = 5 +$$
$$2 \times 8^1 = 2 \times 8 = 16 +$$
$$7 \times 8^2 = 7 \times 64 = 448$$

$$469$$

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Convert Octal to Binary.
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Way 1:

How to Convert Octal to Binary?

- Two steps:
  1. Convert octal to decimal.
  2. Convert decimal to binary.

That's it.

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Way 2:

How to Convert Octal to Binary?

Direct Conversion.

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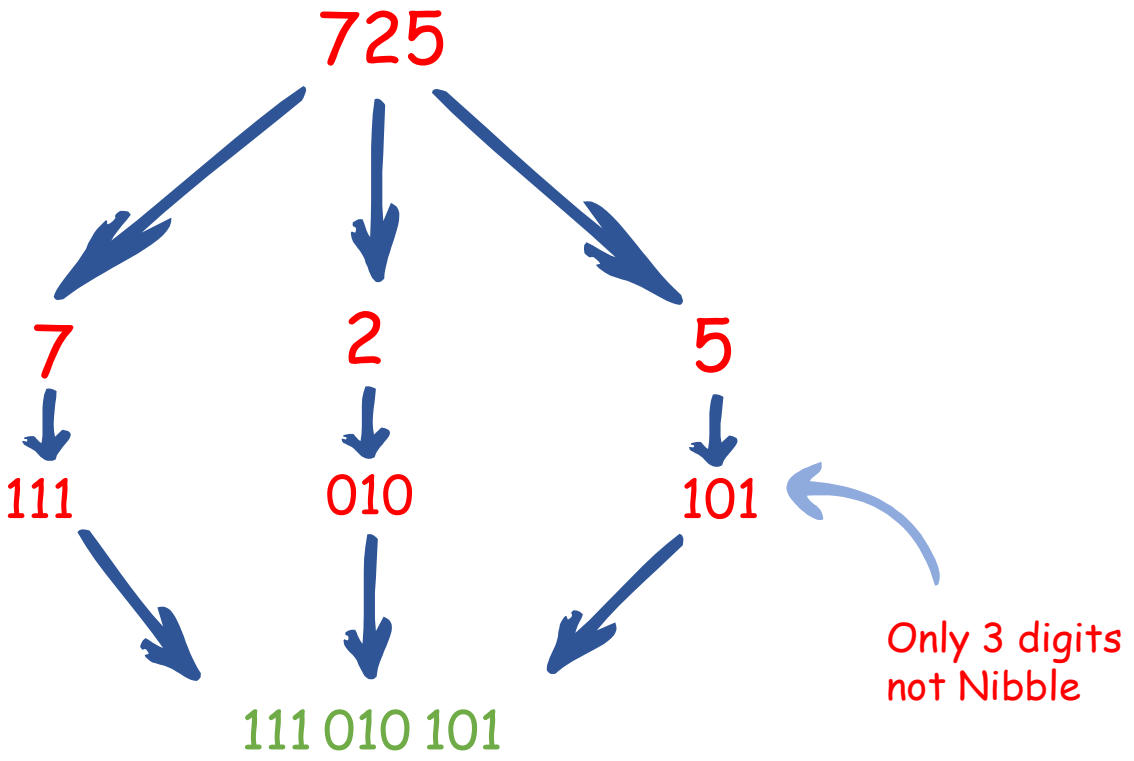
Direct Conversion:

Convert Octal 725 to Binary



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Convert Binary to Oct.
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Way 1:

How to Convert Binary to Octal?

- Two steps:
  1. Convert Binary to Decimal.
  2. Convert Decimal to Octal.

That's it.

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Way 2:

How to Convert Binary to Octal?

Direct Conversion.

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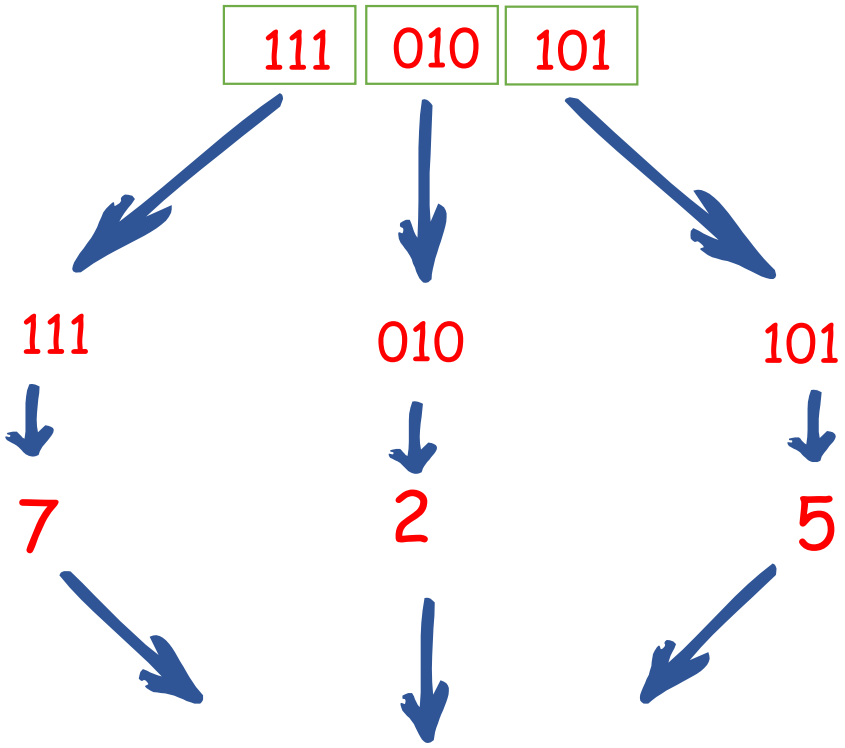
Convert 000111010101 to Octal



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Homework
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1- Convert those Octal numbers to Decimal:

- 100
- 512

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2- Convert those Decimal numbers to Octal:

- 64
- 330

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2- Convert (direct) those Octal numbers to Binary :

- 100
- 512

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3- Convert (direct) those Binary numbers to Octal :

- 0100 0000
- 0001 0100 1010

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Solution
Homework
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Solutions:

1:

- 100 ➔ 64
- 512 ➔ 330

2:

- 64 ➔ 100
- 330 ➔ 512

3:

- 100 ➔ 0100 0000
- 512 ➔ 0001 0100 1010

4:

- 0100 0000 ➔ 100
- 0001 0100 1010 ➔ 512

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Thank you ☺

124 150 141 156 153 040 131 157 165 040 072 055 051 015 012

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