

Day:

23-26-23

Muneeb Lone DS-B

Date: / /

DLD ASSIGNMENT #1

Assigned Number: 7650

Name: ~~Muneeb~~

C0	C1	C2	C3	C4	C5	C6
L	B	e	E	N	U	M

Decimal	Binary	Base 3	Base 4	Base 5	Base 6	Octal	Hexa
0	0	7	7	L	L	0	0
1	1	6	6	B	B	1	1
2	10	5	5	e	c	2	2
3	11	67	0	E	E	3	3
4	100	66	67	N	N	4	4
5	101	65	66	BL	U	5	5
6	110	57	65	BB	BL	6	6
7	111	56	60	Be	BB	7	7
8	1000	55	57	BE	Be	10	8
9	1001	677	56	BN	BE	11	9
10	1010	676	55	eL	BN	12	A
11	1011	675	50	cB	BU	13	B
12	1100	667	67	ee	eL	14	C
13	1101	666	06	cE	eB	15	D
14	1110	665	05	eN	ee	16	E
15	1111	657	00	EL	eE	17	F
16	1000	656	677	EB	eN	20	10
17	10001	655	676	Ee	CU	21	11
18	10000	577	675	EE	EL	22	12
19	10011	576	670	EN	EB	23	13
20	10100	575	667	NL	Ee	24	14
21	10101	567	666	NB	EE	25	15

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	Base 2	Base 3	Base 4	Base 5	Base 6	Base 8	Base 16
22	10110 Base	666	665	Ne	EN	26	16
23	10111	565	660	NE	EU	27	17
24	11000	557	657	NN	NL	30	18
25	11001	556	656	LBL	NB	31	19
26	11010	555	655	LBB	Ne	32	1A
27	11011	6777	650	LBe	NE	33	1B
28	11100	6776	607	LBE	NN	34	1C
29	11101	6775	606	LBN	NU	35	1D
30	11110	6767	605	LcL	UL	36	1E
31	11111	6766	600	LcB	UB	37	1F
32	100000	6765	577	Lcc	Ue	40	20
33	100001	6757	576	LcE	UE	41	21
34	100010	6756	575	LcN	UN	42	22
35	100011	6755	570	LEL	UV	43	23
36	100100	6677	567	LEB	LBL	44	24
37	100101	6676	566	LEE	LBB	45	25
38	100110	6675	565	LEE	LBe	46	26
39	100111	6667	560	LEN	LB	47	27
40	101000	6666	557	LNL	LBN	50	28
41	101001	6665	556	LNB	LB	51	29
42	101010	6657	555	LNe	LBL	52	2A
43	101011	6656	550	LNE	LeB	53	2B
44	101100	6655	507	LNN	Lee	54	2C
45	101101	6577	506	BLL	LeE	55	2D
46	101110	6576	505	BLB	LeN	56	2E
47	101111	6575	500	BLE	LeU	57	2F
48	110000	6567	077	BLE	LEL	60	30
49	110001	6566	076	BLN	LEB	61	31
50	110010	6565	075	ELL	LER	62	32

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$$Q2: (34)_{10} = (?)_3$$

23	16	8	4	2	1
1	0	0	0	1	0

$$\begin{array}{r} 3 \\ \hline 34 \\ 3 \quad | \quad 11 - 1 \\ 3 \quad | \quad 3 - 2 \\ 3 \quad | \quad 1 - 0 \\ 0 - 1 \end{array}$$

using rules

$$(1021)_3 \rightarrow (6756)_3 \text{ Ans.}$$

~~$(52)_{10} = (?)_4$~~

$$\begin{array}{r} 4 \\ \hline 54 \\ 4 \quad | \quad 13 - 0 \\ 4 \quad | \quad 3 - 1 \\ 0 - 3 \end{array}$$

$$(310)_4 \rightarrow (067)_4$$

$$(49)_{10} = (?)_5$$

$$\begin{array}{r} 5 \\ \hline 49 \\ 5 \quad | \quad 9 - 4 \\ 5 \quad | \quad 1 - 4 \\ 0 - 1 \end{array}$$

$$(144)_5 \rightarrow (BNN)_5$$

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$$(53)_{10} = (?)_6$$

7	6	5	0
0	1	2	3

$$\begin{array}{c|cc} 6 & 53 \\ 6 & 8 -5 \\ 6 & 1 -2 \\ 0 & -1 \end{array}$$

L	B	I	E	N	O
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$$(125)_6 \rightarrow (\text{BeU})_6$$

$$Q3: (7650)_{10} \rightarrow (?)_3 (?)_4 (?)_5 (?)_6$$

6	7650	3	7650	4	7650	5	7650
1275-0	2350 - 0			1912 - 2		1530 - 0	
212-3	850 - 0			478 - 0		306 - 0	
35-2	283 - 1			119 - 2		61 - 1	
5-5	94 - 1			29 - 3		12 - 1	
0-5	31 - 1			7 - 1		2 - 2	
	10 - 1			1 - 3		0 - 2	
	3 - 1			0 - 1			
	1 - 0						
	0 - 1						

- $(10111100)_3 \rightarrow (676666677)_3$
- $(1313202)_4 \rightarrow (6060575)_4$
- $(221100)_5 \rightarrow (\text{eeBBLL})_5$
- $(55230)_6 \rightarrow (\text{UUEEL})_6$

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$$\begin{array}{r} \cancel{6} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \\ + \cancel{1} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \cancel{0} \end{array}$$

- $1 \times 3^6 + 0 \times 3^5 + 1 \times 3^4 + 1 \times 3^3 + 1 \times 3^2 + 1 \times 3^1 + 0 \times 3^0 = 7650$
- $1 \times 4^6 + 3 \times 4^5 + 1 \times 4^4 + 3 \times 4^3 + 2 \times 4^2 + 0 \times 4^1 + 2 \times 4^0 = 7650$
- $2 \times 5^6 + 2 \times 5^5 + 1 \times 5^4 + 1 \times 5^3 + 0 \times 5^2 + 0 \times 5^1 = 7650$
- $5 \times 6^6 + 5 \times 6^5 + 2 \times 6^4 + 3 \times 6^3 + 0 \times 6^2 = 7650$

Q4: $0.50 \rightarrow$ Bases 3, 4, 5, 6

Base 3:

$$0.50 \times 3 = 1.50 \rightarrow 1$$

$$0.50 \times 3 = 1.50 \rightarrow 1$$

$$0.50 \times 3 = 1.50 \rightarrow 1$$

Infinite

$$(0.111)_3 \rightarrow (0.777)_3$$

Recheck:

$$1 \times 3^{-1} + 7 \times 3^{-2} + 1 \times 3^{-3} \dots$$

= ~~0.50~~ Answer

is approx 0.5

%

Base 4:

$$0.50 \times 4 = 2.0$$

$$0 \times 4 = 0$$

$$(0.2)_3 \rightarrow (0.6)_3$$

$$2 \times 4^{-1} = 0.5$$

Base 5:

$$0.50 \times 5 = 2.50 \rightarrow 2$$

$$0.50 \times 5 = 2.50 \rightarrow 2$$

Infinite

$$2 \times 5^{-1} + 2 \times 5^{-2}$$

= 0.50 approx

$$(0.22)_3 \rightarrow \text{approx 0.50}$$

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Base 6:

$$0.50 \times 6 = 3.00 \rightarrow 3$$

$$0 \times 6 = 0$$

Recheck:

$$3 \times 6^{-1} = 0.50$$

$$(0.3)_6 \rightarrow$$

Qs: $(765)_3 + (6656)_3$

$$\begin{array}{r} 012 \\ + 1121 \\ \hline 1121 \end{array}$$

$$\begin{array}{r} 1121 \\ + 012 \\ \hline 1210 \end{array} \quad \begin{array}{r} 1121 \\ + 012 \\ \hline 1210 \end{array} \rightarrow (6567)_3$$

• $(7650)_4 + (506)_4$

$$\begin{array}{r} 0123 \\ + 231 \\ \hline 0123 \end{array}$$

$$\begin{array}{r} 0123 \\ + 123 \\ \hline 1330 \end{array} \quad \begin{array}{r} 30123 \\ + 231 \\ \hline 30000 \end{array} \quad \text{A large scribble is to the right.}$$

$$\begin{array}{r} 12 \\ 231 \\ + 123 \\ \hline 1020 \end{array} \rightarrow (6757)_4$$

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$$\begin{matrix} L & B & e & E & N & U \\ 0 & 1 & 2 & 3 & 4 & 5 \end{matrix}$$

- $(LB_e EN)_5 + (LEE)_5$

$$\begin{array}{r}
 0 \ 1 \ 2 \ 3 \ 4 \\
 + \ 0 \ 3 \ 3 \\
 \hline
 1 \ 3 \ 2 \ 2 \rightarrow (BEEe)_5
 \end{array}$$

- $(LB_e ENU)_6 + (NU)_6$

$$\begin{array}{r}
 0 \ 1 \ 2 \ 3 \ 4 \ 5 \\
 + \ 4 \ 5 \\
 \hline
 1 \ 2 \ 4 \ 3 \ 4 \rightarrow (BENEN)_6
 \end{array}$$

Q6: $(7650)_3 - (6565)_3$

$$\boxed{0 \ 1 \ 2 \ 3 - 1 \ 2 \ 1 \ 2}$$

~~0 1 2 3~~
~~0 1 2 3~~
~~0 0 0 0~~

$$1 \ 1 \cancel{2} \ ^0 \ 1 \ 2$$

$$- \ 1 \ 1 \ 2 \ 3$$

$$\begin{array}{r}
 2 \ 0 \ 1 \ 2 \ 3 \ 0 \ 1 \ 2 \ 3 \\
 - 1 \ 2 \ 1 \ 2 = 1 \ 2 \ 1 \ 2 \\
 \hline
 2 \cancel{+} \ 1
 \end{array}$$

3

$$\rightarrow (-10 \ 12)_3 \rightarrow (-6765)_3$$

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- $(7650)_4 - (555)_4$

$$\begin{array}{r}
 7 0 1 2 3 \\
 - 2 2 2 \\
 \hline
 - 1 0 1
 \end{array} \rightarrow (-101)_4 \rightarrow (-676)_4$$

- $(LB\overset{0}{e}E\overset{1}{N}\overset{2}{K})_5 - (LE\overset{3}{e}E\overset{4}{L})_5$

$$\begin{array}{r}
 0 1 2 3 4 \\
 - 3 2 \\
 \hline
 1 2 0 2
 \end{array} \rightarrow (BeLe)_5$$

- $(LB\overset{0}{e}E\overset{1}{N}\overset{2}{K}\overset{3}{N}\overset{4}{U})_6 - (LE\overset{5}{L})_6$

$$\begin{array}{r}
 0 1 2 3 4 5 \\
 - 0 3 0 \\
 \hline
 1 2 3 1 5
 \end{array} \rightarrow (BeEBU)_6$$

Q7 R's and (R-1)'s complement

Base 3:

$$\begin{array}{r}
 (1 0 1 1 1 1 0 0)_3 \\
 \Downarrow \\
 + 1 2 1 1 1 1 \overset{1}{2} 2 \\
 \hline
 1 2 1 1 1 1 2 0 0
 \end{array} \quad \begin{array}{l} 2's \text{ Complement} \\ 1 \\ 3's \text{ Complement} \end{array}$$

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Base 4:

$$\begin{array}{r} (1313202)_4 \\ 2020131 \quad R-1 \text{ Comp.} \\ + \quad 1 \\ \hline 2020132 \quad R \text{ Comp} \end{array}$$

Base 5:

$$\begin{array}{r} (221100)_5 \\ 2233'44 \quad R-1 \\ + \quad 1 \\ \hline 223400 \quad R \end{array}$$

Base 6:

$$\begin{array}{r} (55230)_6 \\ 00325 \quad R-1 \\ + \quad 1 \\ \hline 00330 \quad R \end{array}$$

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Q8: ~~$(565)_3 - (7677776(6566665507))_3$~~

$$(565)_3 - (656666655)_3$$

$$\begin{array}{r} 565 \\ - 666655 \\ \hline 7656686695 \\ + 568 \\ \hline 0 \end{array}$$

$$\begin{array}{r} -121111122 \\ + \quad -10111 \\ \hline -121101011 \rightarrow (656676766)_3 \\ -121111122 \\ + \quad 212 \\ \hline -121110010 \end{array}$$

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• $(19)_4 (670)_4 - (2020131)_4$

~~2 0 2 0 2 0~~

- 202013'

+ 103

- 2020022 $\rightarrow (-5757755)_4$

LBeENU

• $(LeB)_5 - (223344)_5$

021

- 223344

+ 21

- 223323 $\rightarrow (eeEEEeE)_5$

• $(LBL)_6 - (00325)_6$

0 - 0 0 3 2 5

+ 0 1 0

(3 1 5) $\rightarrow (EBU)_6$

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Q9: $(657)_3 - (121111200)_3$

120

$$\begin{array}{r} - 121111200 \\ \hline \end{array}$$
+

$$\begin{array}{r} 120 \\ \hline \end{array}$$

$$\begin{array}{r} -1211\cancel{6}\cancel{0}010 \rightarrow -(656666767)_3 \end{array}$$

• $(670)_4 - (2020132)_4$

$$\begin{array}{r} -2020132 \\ \hline \end{array}$$

$$\begin{array}{r} +103 \\ \hline \end{array}$$

$$\begin{array}{r} -20200023 \rightarrow -(5757750)_4 \end{array}$$

• $(LBL)_5 - (223400)_5$

$$\begin{array}{r} -223400 \\ \hline \end{array}$$

$$\begin{array}{r} +010 \\ \hline \end{array}$$

$$\begin{array}{r} -223340 \rightarrow (EENL)_5 \end{array}$$

• $(LBL)_6 - (330)_6$

$$\begin{array}{r} -330 \\ \hline \end{array}$$

$$\begin{array}{r} +010 \\ \hline \end{array}$$

$$\begin{array}{r} -320 \rightarrow -(EeL)_6 \end{array}$$

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Qn: $(76)_{10} \times (21)_{10}$

$$\begin{array}{r} 76 \\ \times 21 \\ \hline 76 \\ 152x \\ \hline 1596 \end{array}$$

• $(17)_3 \times (7)_5$ • 7 can't be in base 3.

Question doesn't make sense. Converting to custom

~~$$\begin{array}{r} 655 & 11^{10} \\ \times 32 \\ \hline 2020 \\ 11000x \\ \hline 112020 \end{array}$$~~

• 101.101

$$\begin{array}{r} \times 110.101 \\ \hline 101.101 \end{array}$$

0000.00x

$$\begin{array}{r} 101.101xx \\ 000.000xxx \\ \hline 101.101xx \end{array}$$

$$\begin{array}{r} 101.101xxxxx \\ \hline 10101.001 \end{array}$$

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Q11. $50 \div 5$

$$\begin{array}{r} 10 \\ 5 \overline{) 50} \\ -50 \\ \hline \end{array}$$

• $110010 \div 1001$

$$1001 \overline{) 110010}$$

Q12: $(3291) + 7650$

$$\begin{array}{r} 3 2 9 1 \\ + 7 6 5 0 \\ \hline \end{array}$$

$$\begin{array}{r} 111 \\ 0011 0010 1001 00001 \\ + 0111 0110 0101 + 00000 \\ \hline 1010 1000 1110 6001 \end{array}$$

$$\begin{array}{r} 10101000 1110 00001 \\ 10 8 14 1 \\ \hline \end{array}$$

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Q13: $(7650)_10$

2	7650
	3825 - 0
	1912 - 1
	956 - 0
	478 - 0
	119 - 1
	59 - 1
	29 - 1
	14 - 1
	7 - 0
	3 - 1
	1 - 1
	0 - 1

1 1 1 0 1 1 0 0 1 0
XOR

100110001011 Gray Code.
0