Date:

DLD Assignment 1

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Q1) Give value of each digit

(a) $10^3\ 10^2\ 10^1\ 10^0$

6345 = 5x1 = 5, 4x10 = 40, 3x100 = 300, 6x1000 = 6000

(b) $10^5\ 10^4\ 10^3\ 10^2\ 10^1\ 10^0$

278536 = 6x1 = 6, 3x10 = 30, 5x100 = 500, 8x1000 = 8000,
7x10000 = 70000, 2x100000 = 200000

Q2) (Q1) Binary to denary

(a) 10111000 (1st method)

1 + 16 + 32 + 64 + 256 = **369**

(b) 10110011 (1st method)

1 + 2 + 16 + 32 + 128 = **179**

(Q3) Binary to decimal

(a) $1011110 \cdot 1010$ (fractions)

$= 2+4+8+16+64 \cdot \frac{1}{2} + \frac{1}{8} =$ **94.625**

(b) $1111101 \cdot 11011$ (fractions)

$= 1+4+8+16+32+64 \cdot \frac{1}{2} + \frac{1}{4} + \frac{1}{16} + \frac{1}{32} =$ **125.84375**

(Q4) decimal fraction to binary using repeated multiplication

(a) 0.3456

0.0010110001

.3456 × 2 = 0.6912
0.6912 × 2 = 1.3824
.3824 × 2 = 0.7648
0.7648 × 2 = 1.5296
0.5296 × 2 = 1.0592
0.0592 × 2 = 0.1184

(b) 0.9232

0.1110110001010111

0.9232 × 2 = 1.8464 × 2 = 0.2368
.8464 × 2 = 1.6928 — 0.4736
.6928 × 2 = 0.3856 — 0.4472
0.3856 × 2 = 0.7712 — 1.8944
.7712 × 2 = 1.5424
0.5424 × 2 = 1.0848
0.0848 × 2 = 0.1696
0.3392
0.6784
0.3568 × 2 = 0.7136
0.4272 × 2 = 0.8544
0.7088 × 2

(5) Denary to binary using repeated division

(a) 47 : 0101111

(b) 63 = 0111111

2	47
2	23 - 1
2	11 - 1
2	5 - 1
2	2 - 1
2	1 - 0
2	0 - 1
	0 - 0

2	63
2	31 - 1
2	15 - 1
2	7 - 1
2	3 - 1
2	1 - 1
2	0 - 1
	0 - 0

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1's complement

1001110 = 0110001

(b) 10111010 1 = 0100010 10

(7) 2's complement

(a) ~~11001101~~ = 00110010 → 2's → 11001110

(a) 11001101 = 00110011

(b) 11010111 = 00101001

(a) 1121

(10) Convert binary to gray code

(a) 11011 = 10110

(b) 10010101 = 11011111

(c) 1111101111011110 = 1000110011001

(11) Gray code to binary:

(a) 1010 = 1100

(b) 00010 = 00011

(c) 1100001000 = 1000011110

-121

Date:

8 bit sign magnitude

64 32 16 8 4 2 1

1 1111001

(b) 1's complement :

~~1 0000110~~ 00000110

(c) 2's: ~~11111010~~ 00000111

(a) 10011001

(c) -25

(b) 1's = 01100110

2's = 01100111