# CGS3269 Assignment #1

1. Convert $51_{10}$ to binary

| Dividend | Remainder |
|---|---|
| 51/2 = 25 | 1 |
| 25/2 = 12 | 1 |
| 12/2 = 6 | 0 |
| 6/2 = 3 | 0 |
| 3/2 = 1 | 1 |
| 1/2 = 0 | 1 |

Answer: $110011_2$

2. Convert $111110100100_2$ to decimal

$(0 \times 2^0) + (0 \times 2^1) + (1 \times 2^2) + (0 \times 2^3) + (0 \times 2^4) + (1 \times 2^5) + (0 \times 2^6) + (1 \times 2^7) + (1 \times 2^8) + (1 \times 2^9) + (1 \times 2^{10}) + (1 \times 2^{11}) =$

$0 + 0 + 4 + 0 + 0 + 32 + 0 + 128 + 256 + 512 + 1024 + 2048 =$

Answer: $4004_{10}$

3. Convert decimal $1971_{10}$ to octal

| Dividend | Remainder |
|---|---|
| 1971/8 = 246 | 3 |
| 246/8 = 30 | 6 |
| 30/8 = 3 | 6 |
| 3/8 = 0 | 3 |

Answer: $3663_8$

4. Convert octal $6305_8$ to decimal

$(6 \times 8^3) + (3 \times 8^2) + (0 \times 8^1) + (5 \times 8^0) =$

$= 3,072 + 192 + 0 + 5 = 3269$

Answer: $3269_{10}$

5. Convert decimal $2022_{10}$ to hexadecimal

| Dividend | Remainder |
|---|---|
| 2022/16 = 126 | 6 |
| 126/16 = 7 | 14 → E |
| 7/16 = 0 | 7 |

(14 is E in Hex)

(0-9, A-F)

10: A
11: B
12: C
13: D
14: E
15: F

Answer: 7E6

6. Convert hexadecimal $C97_{16}$ to decimal

$C97 = (12 \times 16^2) + (9 \times 16^1) + (7 \times 16^0)$

Answer: $(3,072) + (144) + (7) = 3,223$

Answer: 3,223

7. Convert hexadecimal $9F1_{16}$ to binary

$9F1_{16} =$ 1001 1111 0001

9 F 1

Answer: 100111110001

8. Convert octal $6402_8$ to binary

$6402_8$ = Convert each octal digit to 3 binary digits

6: 110 4: 100 0: 000 2: 010

Answer: 110100000010

9. Convert alphanumeric ASCII "Computer Architecture Concepts" to binary. (Convert to decimal → binary)

C: 67 → 0100 0011 A: 65 → 0100 0001 C: 67 → 0100 0011
o: 111 → 0110 1111 r: 114 → 0111 0010 o: 111 → 0110 1111
m: 109 → 0110 1101 c: 99 → 0110 0011 n: 110 → 0110 1110
p: 112 → 0111 0000 h: 104 → 0110 1000 c: 99 → 0110 0011
u: 117 → 0111 0101 i: 105 → 0110 1001 e: 101 → 0110 0101
t: 116 → 0111 0100 t: 116 → 0111 0100 p: 112 → 0111 0000
e: 101 → 0110 0101 e: 101 → 0110 0101 t: 116 → 0111 0100
r: 114 → 0111 0010 c: 99 → 0110 0011 s: 115 → 0111 0011
t: 116 → 0111 0100
u: 117 → 0111 0101
r: 114 → 0111 0010
e: 101 → 0110 0101

Answer: →

6E6365707473

10. Convert alphanumeric ASCII to Hexadecimal

43 6F 6D 70 75 74 65 72 20 41 72 63 68 69 74 65 63 74 75 72 65 20 43 6F

C: 67 → (67/16: 4 R:3)(4/16: 0 R:4) A: 65 → (65/16: 4 R:1)(4/16: 0 R:4) C: (Same as previous C)
o: 111 → (111/16: R15)(6/16: R6) r: 114 → (Same as previous r) o: (Same as previous o)
m: 109 → (109/16: 6 R:13)(6/16: 0 R:6) c: 99 → (99/16: 6 R:3)(6/16: 0 R:6) n: 110: (110/16: 6 R:14)(6/16: 0 R:6)
p: 112 → (112/16: 7 R:0)(7/16: 0 R:7) h: 104 → (104/16: 6 R:8)(6/16: 0 R:6) c: (Same as previous c)
u: 117 → (117/16: 7 R:5)(7/16: 0 R:7) i: 105 → (105/16: 6 R:9)(6/16: 0 R:6) e: (Same as previous e)
t: 116 → (116/16: 7 R:4)(7/16: 0 R:7) t: 116 → (Same as previous t) p: (Same as previous p)
e: 101 → (101/16: 6 R:5)(6/16: 0 R:6) e: 101 → (Same as previous e) t: (Same as previous t)
r: 114 → (114/16: 7 R:2)(7/16: 0 R:7) c: 99 → (Same as previous c) s: 115: (115/16: 7 R:3)(7/16: 0 R:7)
t: 116 → (Same as previous t)
u: 117 → (Same as previous u)
r: 114 → (Same as previous r) e: 101 → (Same as previous e)