CS1021 Tutorial #1 Solution
Information Storage Units and Numeral Systems

1 Units of Information Storage

(a) (i) 1,024

(ii) 1,048,576

(iii) 4,718,592

(iv) 134,217,728 (or $16 \times 2^{20} \times 8$)

(b) (i) 256

(ii) 262,144

(iii) 255

(c) 921,600B or 900kB

2 Numeral Systems

(a) (i) 10^1 or 10

(ii) 10^2 or 100

(iii) 10^4 or 10,000

(b) (i) 2^4 or 16

(ii) 2^7 or 128

(iii) 2^{12} or 4,096

(c) (i) 16^1 or 16

(ii) 16^4 or 65,536

(iii) 16^6 or 16,777,216

(d) (i) 2^{16} or 65,536

(ii) $0 \ldots 2^{16} - 1$ or $0 \ldots 65,535$

(iii) 2^{32} or 4,294,967,296

(iv) $0 \ldots 2^{32} - 1$ or $0 \ldots 4,294,967,295$

(e) (i) 10

(ii) 166

(iii) 255

(iv) 128

(f) (i) 1001

(ii) 1000000

(iii) 111111

(g) (i) 7

(ii) A

(iii) 9C

(iv) 26

(h) (i) 1111 1111 1111 1111

(ii) 1010 0000 1000 1100

(iii) 0100 1111 0001 1110 0000 1000 0000 1100

(i) (i) 10

(ii) 11

3 Memory Addresses

0x2054

4 ARM Assembly Language

```
1    ADD R0, R1, R2        ; x + y
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```
1    SUB R0, R2, R1        ; y - x
```

```
1    MUL R0, R1, R1        ; x^2
```

```
1    LDR R3, =5
2    MUL R0, R2, R3        ; 5y
```

```
1       LDR R3, =3
2       MUL R0, R1, R3          ; 3x
3       ADD R0, R0, R2          ; +y
```