Daniel Rogers Due 9/15

Homework 0

1. a) $100 = 64 + 32 + 4$

$= 1\cdot 2^6 + 1\cdot 2^5 + 0\cdot 2^4 + 0\cdot 2^3 + 1\cdot 2^2 + 0\cdot 2^1 + 0\cdot 2^0$

in base 2, $= 1100100$

b) $100 = 81 + 18 + 1$

$= 1\cdot 3^4 + 0\cdot 3^3 + 2\cdot 3^2 + 0\cdot 3^1 + 1\cdot 3^0$

in base 3, $= 10201$

c) $100 = 64 + 32 + 4$

$= 1\cdot 4^3 + 2\cdot 4^2 + 1\cdot 4^1 + 0\cdot 4^0$

in base 4, $= 1210$

d) $100 = 100$

$= 4\cdot 5^2 + 0\cdot 5^1 + 0\cdot 5^0$

in base 5, $= 400$

e) $100 = 72 + 24 + 4$

$= 2\cdot 6^2 + 4\cdot 6^1 + 4\cdot 6^0$

in base 6, $= 244$

f) $100 = 98 + 2$

$= 2\cdot 7^2 + 0\cdot 7^1 + 2\cdot 7^0$

in base 7, $= 202$

g) $100 = 64 + 32 + 4$

$= 1\cdot 8^2 + 4\cdot 8^1 + 4\cdot 8^0$

in base 8, $= 144$

h) $100 = 81 + 18 + 1$

$= 1\cdot 9^2 + 2\cdot 9^1 + 1\cdot 9^0$

in base 9, $= 121$

i) $100 = 100$

$= 1 \cdot 10^2 + 0 \cdot 10^1 + 0 \cdot 10^0$

* in base 10, 100

j) $100 = 99 + 1$

$= 9 \cdot 11^1 + 1 \cdot 11^0$

in base 11, 91

k) $100 = 96 + 4$

$= 8 \cdot 12^1 + 4 \cdot 12^0$

in base 12, 84

2. $101 \cdot 97$: 1 0 1

1 0 -3

-3 0 -3

1 0 1

1 0 -2 0 -3

$(1, 0, -2, 0, -3) = 9797$

3. $26_{10} = 18 + 6 + 2$

$= 2 \cdot 3^2 + 2 \cdot 3^1 + 2 \cdot 3^0 = 222_3$

$80_{10} = 54 + 18 + 6 + 2$

$= 2 \cdot 3^3 + 2 \cdot 3^2 + 2 \cdot 3^1 + 2 \cdot 3^0 = 2222_3$

$222 \cdot 2222$: 1 0 0 -1

1 0 0 0 -1

-1 0 0 1

1 0 0 -1

1 0 0 -1 -1 0 0 1 = 2212001

4.

Base 10	Base 3	Base 10	Base 3
1	1	14	112
2	2	15	120
3	10	16	121
4	11	17	122
5	12	18	200
6	20	19	201
7	21	20	202
8	22	21	210
9	100	22	211
10	101	23	212
11	102	24	220
12	110	25	221
13	111	26	222

Box 1: 1 4 7
10 13 16
19 22 25

Box 2: 2 5 8
11 14 17
20 23 26

Box 3: 3 4 5
12 13 14
21 22 23

Box 4: 6 7 8
15 16 17
24 25 26

Box 5: 9 10 11
12 13 14
15 16 17

Box 6: 18 19 20
21 22 23
24 25 26