CE 6305, Homework 2

1. Perform redundant BSD addition to do the following sums, and give the intermediate values and answers in the form shown in the first example below:

   (a) $1\ \overline{1}\ \overline{1}\ 1\ 1\ 0 + 0\ 1\ 1\ 0\ 1\ 0$

   (b) $1\ \overline{1}\ 1\ \overline{1}\ \overline{1}\ 0 + 0\ 0\ 1\ \overline{1}\ 0\ 1$

   (c) $1\ 0\ 0\ 1\ 1\ 0 + 0\ 1\ 1\ \overline{1}\ 1\ 0$

   Comment on the results obtained in each case.

   Answer for part (a)

X:	1	$\overline{1}$	$\overline{1}$	1	1	0	: 14
Y:	0	1	1	0	1	0	: 26
e:	1	1	0	0	0	0	
s:	1	0	0	$\overline{1}$	0	0	
c:	0	0	1	1	0	0	
Z:	1	0	1	0	0	0	: 40

   Here, the e_i signal is coded so that it is a 1 when $c_i \in \{0, \overline{1}\}$. Note that X=1,Y=$\overline{1}$, or vice versa, causes $e = 1$.

2. Design an unlimited carry-free addition system for radix = 3, and digit set $d_i \in [-4, 5]$.

   (a) Give suitable values for λ and μ.

   (b) Determine the range of values for the transfer digits for each intermediate sum value, $p_i \in [-8, 10]$.

   (c) If there are 8 digits in a number in this system, what is the corresponding range?

   (d) Show the system ay work by giving the working to the addition: [-3,4,4,-1] + [5,4,-2,-4].

   More on page 2.

3. In which of the following is an unlimited carr-free system possible?

   (a) $r = 3, \ \ \alpha = 1, \ \ \beta = 2$

   (b) $r = 2, \ \ \alpha = 1, \ \ \beta = 1$

   (c) $r = 10, \ \ \alpha = 4, \ \ \beta = 5$

   (d) $r = 4, \ \ \alpha = 2, \ \ \beta = 2$