Lab Assignment - 12

Instructor: Dr. Arabin Kumar Dey

1 Due date:

- 3/3/2013.

2 Notes:

- Make a proper documentation preferably in latex or using some other software and submit the printout of the report in .pdf form.
- Each student needs to write his/ her own solutions, even though discussions of the assignments between students are encouraged.

3 Assignments:

1. Generate the first 25 values of the Van der Corput sequence $x_1, x_2, \cdots, x_{25}$ using the radical inverse function $x_i := \phi_2(i)$ and list them in your report. Next, generate the first 1000 values of this sequence and plot the overlapping pairs (x_i, x_{i+1}) as a two dimensional plot. What do you observe ? Now, generate first 100 and 100000 values of this sequence and plot the sampled distributions for both the cases. Compare these plots with the sampled distributions of 100 and 100000 values generated by an LCG, by plotting the sampled distributions in two graphs side by side for both the cases. Specify the LCG that you have used.

2. Generate the Halton sequence $x_i = (\phi_2(i), \phi_3(i))$ (as points in R^2) and plot the first 100 and 100000 values. What are your observations ?

   Recall that the radical inverse function is defined by $\phi_b(i) = \sum_{k=0}^{j} d_k b^{-k-1}$ **where** $i = \sum_{k=0}^{j} d_k b^k$