**ST. XAVIER’S COLLEGE**

**(Affiliated to Tribhuvan University)**

**Maitighar, Kathmandu**

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**SIMULATION AND MODELING LAB REPORT #02**

**SUBMITTED BY:**

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017BSCIT029

3rd year/ 5th Sem

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| --- | --- |
|  | Signature |
| Mr. Ganesh Yogi  (Lecturer) |  |
| Department of Computer Science | |

**SUBMITTED TO:**

**TITLE: TO SIMULATE THE RANDOM WALK OF PARTICLES.**

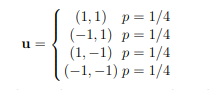
**THEORY:**

A random walk is a fundamental physical process in which a random walker — a particle, an atom, a measurement, an individual — moves in random steps. A typical example is the Brownian motion of small particles due to the thermal motion of atoms. Another example is the spreading of an atom throughout a fluid.

**In one dimension,** we can describe a random walk by its random individual steps, UI, where i is the step number. The step ui is a random variable that may have some distribution. The position, x, of the walker after N steps is the sum of the individual steps:

x(N) = ∑ ui

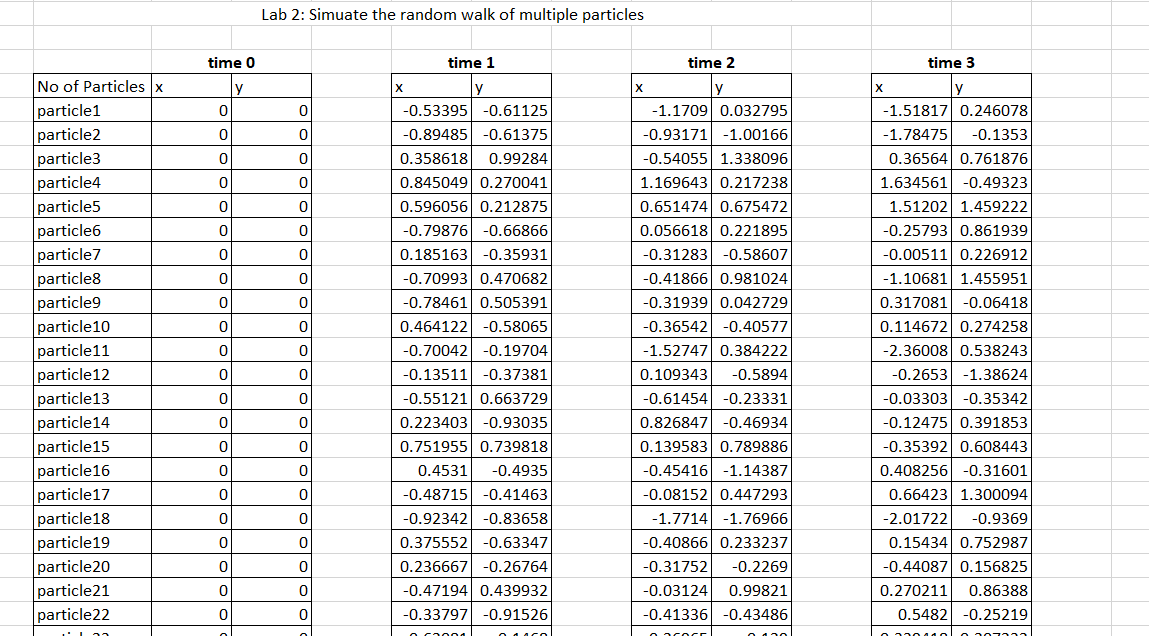
**Random walks in two dimensions.** We can define random walks in any dimension, simply by assuming the individual steps can occur in any dimension. In two dimensions we may introduce u, which may for example be

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This simply corresponds to selecting one ui in the x-direction and and vi in the y-direction with the same distribution.

**Procedure**

**Step1:** Make table entries as in the figure below



**Step2:** For Time0, take X and Y Co-ordinates as 0(Particles at rest)

**Step3**: For time-N, use

X =D4+ (1-2\*RAND ( )); take previous X co-ordinate value

Y =E4+ (1-2\*RAND ( )); take previous Y co-ordinate value

**Step4:** Plot graph for each Time

**CONCLUSION**

Hence, the random walk of particles was simulated using EXCEL