

Subject Code : 1CS2010206	Subject Title: WORKSHOP – II (INTRODUCTION TO SIMULATION AND STATISTICAL TOOLS)
Pre-requisite :	-

Course Objective:

The objective of this course is to give hands-on experience of Network simulation tool & statistical software package. The course also intends to make the students aware of various simulation options in open source tools/packages.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
-	-	2	2	-	-	30	20	50

List of Experiments using Network Simulations

- To install and configure NS2.
- Create a network with two nodes. Establish a full-duplex link between them with 1Mbps capacity and 10ms delay.
- Create a network with two nodes. Attach an UDP agent with CBR traffic generator to first node. Attach a null sink agent to second node. Connect UDP agent with NULL agent. Define packet size = 500 B and traffic rate 0.005 second per packet. Run a simulation for 5 second, where the data transmission should start at 0.5 second and end at 4.5 second.
- Create a network with four nodes (n0 to n3). Set duplex links (1Mb, 10ms) between n0 and n2, n1 and n2 and n3 and n2. Attach an UDP0 agent with CBR traffic generator to n0. Attach an UDP1 agent with CBR traffic generator to n1. Attach a NULL0 sink agent to n3. Connect UDP0 to NULL0 and UDP1 to NULL0. Define packet size = 500 B and traffic rate 0.005 second per packet. Run a simulation for 5 second. Turn on the traffic between n0 to n3 during 0.5s to 4.5s. Turn on the traffic between n1 to n3 during 1.0s to 4.0s.
- (ROUTING) Create a network with seven nodes (n0 to n6) using arrays in circular fashion. Set duplex links (1Mb, 10ms) between n0 and n1, n1 and n2 and so on. Attach an UDP0 agent with CBR traffic generator to n0. Attach a NULL0 sink agent to n3. Connect UDP0 to NULL0. Define packet size = 500 B and traffic rate 0.01 second per packet. Run a simulation for 5 second. Schedule the traffic from n0 to n3 at 0.5s. The link between n1 and n2 breaks down at 1.0s. And the link is up at 2.0s. Stop the traffic at 4.5s. Observe the behavior of traffic.

List of Experiments using Statistical Tools

- Measures of Central Tendency and Dispersion.
- Model Sampling from Simple Continuous Distributions
- Fitting of binomial & Poisson distribution
- Fitting of normal distribution
- Common tests of significance like t-tests and Chi-Square tests
- Random number generation from different distributions
- Correlation and Linear Regression Analysis.

Assignment:

- Students are expected to search various open source tools for (a) network simulations (b) statistics and (c) numerical computation
- Experiments using Open Source Software for Numerical Computation (E.g. scilab.org)

Course Outcome:

At the end of this course, the student would be able

- To get the ideas of any statistical tools for analysis purpose.
- To understand statistical aspect of computer science and implement it.
- To understand basic features of network simulation tool NS2.

List of References:

1. Gardener M. (2010) Beginning R : The Statistical Programming Language, Wiley India Pvt. Ltd., New Delhi
2. A Handbook of Statistical analysis using SPSS by Sabine Landau and BrianS. Everitt
3. Bhattacharjee, D. (2010). Practical Statistics using Microsoft Excel, Asian Books, New Delhi
4. Bruce L.L. and Hanselman D. C. (1996). Mastering Matlab 7
5. Gilat A. (2004) Matlab: An Introduction with Applications, 4th Edition, Wiley India Pvt. Ltd., New Delhi

E-Resource / Web Links:

1. <http://www.gnu.org/software/pspp/manual/pspp.html>
2. <https://cran.r-project.org/manuals.html>
3. <http://scilab.org/>