OR Tools

FOSS Tools for Operations Research

Operations Research (OR) includes various advanced analytical methods used to model and solve complex problems, leading to better decisions. Optimisation and Simulation are the areas of focus in the FOSSEE OR Tools project.

- **Mathematical optimisation techniques** are used to find the best solution(s) of decisions problems arising in various fields.

- **Simulation based analysis** involves modelling complex systems in a computer and numerically simulating them to understand and analyse the system behaviour.

OR Tools Project Goals

- Promote the use of FOSS such as COIN-OR, GLPK, SimPy, etc. to solve problems in OR.

- Interface these tools with popular open-source environments such as Scilab, Python, LibreOffice.

- Develop tutorials and documentation for using OR Tools in classroom.

Featured Software

COIN-OR

- Online repository for open source software developed by the COIN-OR Foundation, Inc.

- CLP (Coin Linear Program) and CBC (Coin Branch and Cut) solver are important tools for integer and linear optimisation.
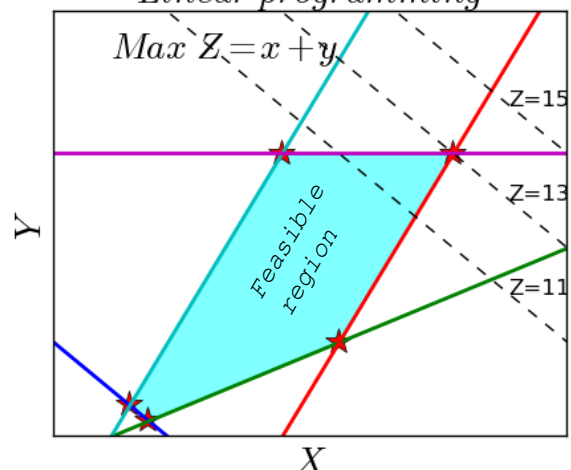
SimPy

- Open source Python based discrete-event simulation software package released under GNU-GPL.

- Based on ideas from Simula and Simscript but uses standard Python.

- Alternative to expensive commercial simulation packages.

Branch-and-bound tree for solving an MINLP
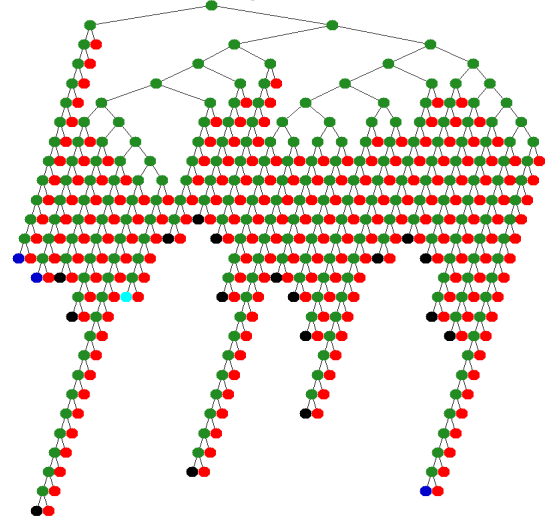
Linear programming

$Max\ Z = x + y$

Z=15

Z=13

Feasible region

Z=11

Y

X

IIT Bombay

http://www.fossee.in

Flagship Activities

Textbook Companion aims to provide FOSS code for solved examples in standard textbooks, thereby enabling students to learn the subject as well as the open source software easily.

List of completed textbooks:

- *Introduction to Operations Research by F.S. Hillier, G.J. Lieberman, 8th Ed., Tata McGraw-Hill, 2005*

- *Linear Programming-An Introductory Analysis by N. Paul Loomba, McGraw-Hill, 1964*

- *Operations Research: An introduction by Hamdy A.Taha, 7th Ed., Prentice Hall, 2002*

- *Discrete-Event System Simulation by J. Banks, J. S. Carson, B. L. Nelson and D. M. Nicol, 4th Ed., PHI Learning Pvt.Ltd, 2009*

Participate and earn attractive honorarium and Certificate of Internship from IIT Bombay.

To know more about Textbook companion please visit http://or.fossee.in/textbook-companion

Lab Migration helps you in migrating your labs that use proprietary software to FOSS only labs, thereby saving your money and to avoid software piracy.

To know more about lab migration please visit http://or.fossee.in/lab-migration
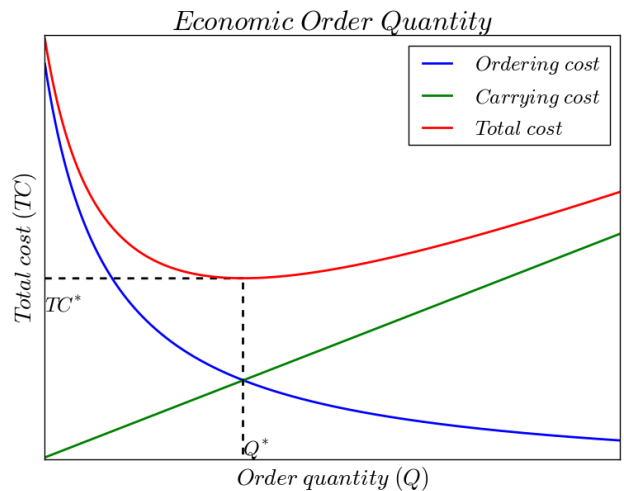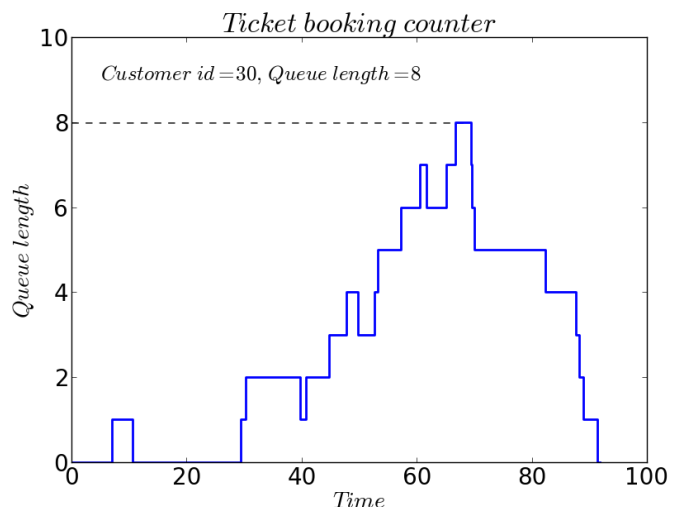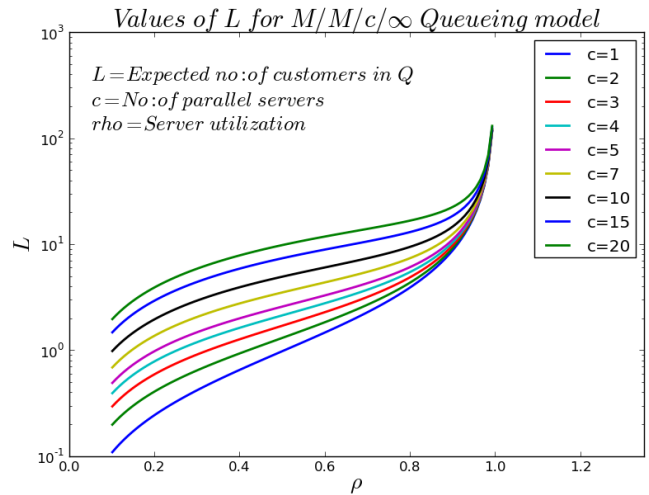
SELF Workshops

We help to conduct SELF (Spoken-tutorial based Education and Learning through Free FOSS study) workshops free of cost.

To know more about self workshop please visit http://or.fossee.in/self-workshop

We are eagerly looking for enthusiastic people who can grow along with us through teaching and learning. Feel free to **join us** on our mission.

Contact us

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Values of L for $M/M/c/\infty$ Queueing model

L = Expected no : of customers in Q
c = No : of parallel servers
rho = Server utilization

Legend: c=1, c=2, c=3, c=4, c=5, c=7, c=10, c=15, c=20

Ticket booking counter

Customer id = 30, Queue length = 8

Economic Order Quantity

Legend: Ordering cost, Carrying cost, Total cost

TC^*, Q^*, Total cost (TC), Order quantity (Q)

Other FOSSEE Projects

Scilab	**scilab.in**
Python	**python.fossee.in**
OpenFOAM	**cfd.fossee.in**
Oscad	**oscad.in**