

NPTEL Video Lecture Topic List - Created by Linuxpert Systems, Chennai

NPTEL Video Course - Mathematics - NOC:Computational Mathematics with SageMath

Subject Co-ordinator - Prof. Ajit Kumar

Co-ordinating Institute - Institute of Chemical Technology - Mumbai

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Installation of Python
Lecture 2 - Getting Started with Python
Lecture 3 - Python as an advanced calculator
Lecture 4 - Lists in Python
Lecture 5 - Tuple, Sets and Dictionaries in Python
Lecture 6 - Functions and Branching
Lecture 7 - For loop in Python
Lecture 8 - While loop in Python
Lecture 9 - Creating Modules and Introduction to NumPy
Lecture 10 - Use of NumPy module
Lecture 11 - Python Graphics using Matplotlib
Lecture 12 - Use of SciPy and SymPy in Python
Lecture 13 - Classes in Python - Part 1
Lecture 14 - Classes in Python - Part 2
Lecture 15 - Introduction and Installation of SageMath
Lecture 16 - Exploring integers in SageMath
Lecture 17 - Solving Equations in SageMath
Lecture 18 - 2d Plotting with SageMath
Lecture 19 - 3d Plotting with SageMath
Lecture 20 - Calculus of one variable with SageMath - Part 1
Lecture 21 - Calculus of one variable with SageMath - Part 2
Lecture 22 - Applications of derivatives
Lecture 23 - Integration with SageMath
Lecture 24 - Improper Integral using SageMath
Lecture 25 - Application of integration using SageMath
Lecture 26 - Limit and Continuity of real valued functions
Lecture 27 - Partial Derivative with SageMath
Lecture 28 - Local Maximum and Minimum
Lecture 29 - Application of local maximum and local minimum

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- Lecture 30 - Constrained optimization using Lagrange multipliers
- Lecture 31 - Working with vectors in SageMath
- Lecture 32 - Solving system of linear Equations in SageMath
- Lecture 33 - Vector Spaces in SageMath
- Lecture 34 - Basis and dimensions of vector spaces in SageMath
- Lecture 35 - Matrix Spaces with SageMath
- Lecture 36 - Linear Transformations - Part 1 with SageMath
- Lecture 37 - Linear Transformations - Part 2 with SageMath
- Lecture 38 - Eigenvalues and Eigenvectors - Part 1 with SageMath
- Lecture 39 - Eigenvalues and Eigenvectors - Part 2 with SageMath
- Lecture 40 - Inner Product - Part 1 with SageMath
- Lecture 41 - Inner Product - Part 2 with SageMath
- Lecture 42 - Orthogonal Decomposition with SageMath
- Lecture 43 - Least Square Solution with SageMath
- Lecture 44 - Singular Value Decomposition (SVD) with SageMath
- Lecture 45 - Application of SVD to image processing
- Lecture 46 - Solving System of linear ODE using Eigenvalues and Eigenvectors
- Lecture 47 - Google Page Rank Algorithm using SageMath
- Lecture 48 - Finding Roots of algebraic and transcendental equations in SageMath
- Lecture 49 - Numerical Solutions of System of linear equations in SageMath
- Lecture 50 - Interpolations in SageMath
- Lecture 51 - Numerical Integration in SageMath
- Lecture 52 - Numerical Eigenvalues
- Lecture 53 - Solving 1st and 2nd order ODE with SageMath
- Lecture 54 - Euler's Method to solve 1st order ODE with SageMath
- Lecture 55 - Fourth Order Runge-Kutta Method
- Lecture 56 - RK4 method for System of ODE and Applications
- Lecture 57 - Solving ODE using Laplace Transforms in SageMath
- Lecture 58 - Introduction to Linear Programming Problems (LPP)
- Lecture 59 - Solving Linear Programming Problems using Graphical Methods
- Lecture 60 - Basics Definitions and Results in LPP
- Lecture 61 - Theory of Simplex Method
- Lecture 62 - Simplex Methods in SageMath - Part 1
- Lecture 63 - Simplex Methods in SageMath - Part 2
- Lecture 64 - Simplex Methods in Matrix Form
- Lecture 65 - Revised Simplex Method in SageMath
- Lecture 66 - Two Phase Simplex Method in SageMath
- Lecture 67 - Big-M Method in SageMath
- Lecture 68 - Duality of Linear Program

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Lecture 69 - Dual Simplex Method in SageMath
Lecture 70 - Review and What next in SageMath?