Fundamentals of Computer Programming

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1. Syllabus day: Introductions, Syllabus, Environment setup
2. Bash day 1: Learning to use text terminals, Learning basic text terminal commands, Invoking programs, Batch file operations, Wildcards, Searching contents of files
3. Bash day 2: SSH connections to department servers, SSH keys for passwordless authentication, SCP access to your department files, GNU Screen for session persistence, Running jobs on department compute servers
4. LaTex day 1: How to invoke LaTex, Document type Article, Importing packages, Math fields, Simple math commands
5. LaTex day 2: Using newcommand, Creating environments, Indexing, Parameters, Optional parameters
6. LaTex day 3: Document type Beamer, Installing custom LaTex packages/themes
7. LaTex day 4: Bibliographies, Footnotes, Absolute Positioning
8. LaTex day 5: Academic Papers, Importing Images/data, Books, Conforming to Journal Requirements
9. CV Day: Write a TeX Curriculum Vitae
10. HTML day 1: Hello World from scratch, Looking under the hood of websites, Using inspectors, Changing content on webpages
11. HTML day 2: Saving websites, Combining features of websites, Creating your own department website, Uploading your website to the department index
12. Python Day 1: Hello world, Datatypes: int, str, float, Datatypes: list, set, dict, Functions
13. Python Day 2: Flow Control, Loops, Conditionals, Comprehensions
14. Python Day 3: Object Oriented Programming, Classes, Methods, Formatting strings
15. Python Day 4: Using Libraries/Modules/Packages, Stdlib math module, Stdlib statistics module, Stdlib random module, Documenting, Basic testing, Creating modules
16. Python Day 5: Advanced Flow Control, Error Throwing/Catching, Breaking Loops, Errors

17. Python Day 6: Reading/writing files, Navigating files with os, Stdlib datetime, Pickling/unpickling objects, Saving state, resuming computations
18. Numpy Day 1: Numpy datatypes, Numerical precision, Numpy arrays
19. Numpy Day 2: Reshaping arrays, Types of array product, Convolving arrays
20. MatPlotLib Day 1: Constructing axes, plots, Plotting numpy data, Plotting python functions, Subplots, Axis labels, Saving
21. MatPlotLib Day 2: Bar graphs, Scatter plots, Advanced Axis Label Formatters, 3D Plotting
22. Pandas Day: Reading data files, Dataframe object, Large data operations, Plotting from pandas
23. SymPy Day 1: Sympy objects: variable, expression, Identifying objects, Extracting data from objects
24. Git day 1: Git init, Commit messages, Reading commit comments, Traversing the commit history
25. Git day 2: Github, Git pull, Basic branching, Stashing
26. Git/Sympy Project Day: Collaborating, Merging commits, Working on a project, Parsing strings into expressions
27. SQL Day 1: Designing data models, Primary keys, Compound keys, First 3 normal forms
28. SQL Day 2: Constructing your first database, Creating tables, Inserting data, Selecting data, Simple Joins
29. SQL-Python Project Day 1: Sql python interface, Importing data, Creating reports, Using databases in production
30. SQL-Python Project Day 2: Python command line interfaces, Statistical Queries, Aggregators
31. MATLAB Day 1: How to MATLAB on a budget, MATLAB datatypes, precision, Basic matrix operations, Arrays, Reshaping arrays
32. MATLAB Day 2: Flow Control, How to loop, why not to, Plotting, Labeling axes, Line graphs, Bar graphs, Scatter plots
33. Advanced Graphing Tools: Geogebra 2D and 3D Interactive Plotting, Geogebra Geometry tools, Geogebra Exports, Inkscape Editing, SVG
34. Scikit Learn Day 1: A learning adventure, together

35. Scikit Learn Day 2 + Regular Expressions: Continuing this adventure, And Regular Expressions, Too

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