KIDS & TEENS FREELANCING TRAINING INSTITUTE

SCIPY Course Outline

Module 1: What is SciPy?

- Simple definition: SciPy is a Python library for science and math problems
- It helps solve complex calculations easily and quickly
- Real-life example: Like using a scientific calculator with superpowers
- Activity: Compare doing math with and without SciPy in code

Module 2: How SciPy Works with NumPy

- SciPy builds on NumPy for advanced tasks
- Real-life example: NumPy is the engine, SciPy is the full car
- Understand how arrays and data flow between the two
- Activity: Import both libraries and do a simple calculation

Module 3: Scientific Functions Made Simple

- Learn about modules like `integrate`, `optimize`, and `interpolate`
- Real-life example: Estimating travel time or minimizing costs
- Why SciPy is useful in science, finance, and AI
- Activity: Try a basic optimization problem (e.g., find the best price)

Module 4: Working with Stats and Signals

- Use `stats` for data analysis and `signal` for signal processing
- Real-life example: Analyzing music beats or stock data
- Simple explanation of probability, mean, standard deviation
- Activity: Analyze random data using SciPy stats functions

Module 5: Linear Algebra and Matrices

- Solve equations, do matrix multiplication, and more
- Real-life example: Finding unknowns in math like in school equations
- Why this is critical in physics, engineering, and robotics
- Activity: Solve a basic matrix problem using `scipy.linalg`

Module 6: Advanced Math with Less Code

- Use SciPy's special functions and constants
- Real-life example: Calculating angles, speeds, or reactions
- See how hard math becomes easy with a few lines of code
- Activity: Use `scipy.special` to find values of complex functions

Module 7: Real-World Uses of SciPy

- Used in research, simulations, AI models, and labs
- Real-life example: Scientists modeling the spread of diseases
- Companies like NASA, Google, and Pfizer use SciPy
- Activity: Analyze a simple science experiment dataset

Module 8: SciPy for Career Growth

- Careers: Data Scientist, Research Engineer, Machine Learning Expert
- SciPy helps with building smarter apps and models
- Real-life example: Smartwatches tracking your health use such tools
- Activity: Sketch an app idea that uses SciPy inside

Bonus Materials

- Ready-to-use SciPy code notebook
- Flashcards with key SciPy modules
- Practice problems in physics and finance
- Mini lab project using real-world formulas
- Certificate of Completion for SciPy