

**NumPy Basic Project List** — perfect for beginners to practice data manipulation, arrays, and numerical operations

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## **NumPy Basic Project Ideas**

### **Level 1 – Very Basic**

#### **1. Array Basics Playground**

- Create, reshape, slice, and concatenate arrays

#### **2. Student Marks Analyzer**

- Find total, average, highest & lowest marks using NumPy

#### **3. Temperature Converter**

- Convert Celsius ↔ Fahrenheit using vectorized operations

#### **4. Number Pattern Generator**

- Generate patterns like identity matrix, diagonal matrix

#### **5. Dice Roll Simulator**

- Generate random dice outcomes & analyze frequency
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### **Level 2 – Beginner**

#### **6. Bank Data Interest Calculator**

- Apply interest on arrays & compute growth for multiple customers

#### **7. COVID Data Mini Dashboard**

- Daily case arrays → sum, mean, percent increase

#### **8. Retail Sales Analysis**

- Product-wise total & monthly revenue using array operations

#### **9. Movie Rating Analytics**

- Min, max, avg rating per movie & sorting with NumPy

#### **10. Electricity Bill Estimator**

- Units array → price slabs → total bill calculation
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### **Level 3 – Practical Mini Projects**

#### **11. Image Pixel Brightness Analyzer**

- Use NumPy to increase, decrease, or normalize pixel values (grayscale image)

#### **12. Weather Trend Analysis**

- Analyze weekly/monthly weather data and find anomalies

#### **13. Stock Price Analytics**

- Daily closing prices → Return % → volatility measurement

#### **14. E-commerce Customer Behavior Matrix**

- Rows: Customers | Columns: Product categories → stats & sorting

#### **15. Sport Player Stats Matrix**

- Convert performance data into arrays & analyze best performer
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### **Level 4 – Challenge Based**

#### **16. Sudoku Board Validator**

- Check valid rows, columns, and 3×3 grids using array inspection

#### **17. Image Noise Addition & Filtering**

- Add random noise and apply simple filters with NumPy

#### **18. Logistics Route Optimization (Basic)**

- Compute distance matrix and find shortest warehouse path

#### **19. Election Vote Analysis Simulation**

- Count votes per candidate → find winner using NumPy functions

#### **20. Fraud Transaction Detection (Simple)**

- Detect outliers in transaction amount array
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### **Additional Creative Ideas**

- Fitness Tracker Data Analysis
- Audio Waveform Normalization
- School Attendance Percentage Calculator

- Social Media Engagement Rate Analyzer
  - ATM Cash Withdrawal Pattern Insight
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✓ Step-by-step instructions

✓ Dataset for each project

✓ Code + Output + Explanation

✓ PDF Portfolio format