# Tool Metadata Report (by MetadataFetcher)

## 1. General Information

| Name | pandas |
|---|---|
| **Use Case** | Data Science and Analytics Tools |
| **Homepage** | https://pandas.pydata.org/ |
| **Description** | Pandas is an open-source Python library designed for data manipulation and analysis. It provides data structures like Series (1D) and DataFrames (2D) to easily clean, transform, and analyze large datasets. Created by Wes McKinney in 2008, pandas is widely used by data scientists, analysts, and researchers worldwide. |

## 2. Applications

Reading and writing data from various file formats (CSV, Excel, SQL databases)
Data cleaning and preparation by handling missing values and filtering entries
Merging and joining multiple datasets seamlessly
Statistical analysis and generating descriptive statistics
Data visualization with integrated plotting capabilities
Time series analysis and manipulation

## 3. Supported Data Formats

CSV, Excel, JSON, SQL databases, Text files, HTML tables
Parquet, H
Web APIs and various database connections

## 4. Visualization Capabilities:

Built-in plotting functions for data visualization
Integration with Matplotlib for advanced plotting
Basic charts, histograms, and statistical plots

## 5. Integration with Other Libraries:

NumPy for numerical operations
Matplotlib for data visualization
Jupyter Notebook for interactive analysis
Scikit-learn for machine learning workflows

## 6. Installation & Setup:

```
pip install pandas
pip install pandas[all]  # Includes optional dependencies
conda install pandas
```

## 7. Key Features:

DataFrame and Series data structures
Powerful data manipulation operations (groupby, merge, pivot)
Missing data handling
Time series functionality
Data input/output tools

High-performance operations on large datasets

### 8. Community & Ecosystem:
Large, active community with extensive documentation
Regular updates and improvements
Comprehensive tutorials and learning resources
Integration with broader Python data science ecosystem

### 9. Documentation & Learning Resources:
Official pandas documentation
Comprehensive user guide and API reference
Interactive tutorials and examples
Community-contributed learning materials

### 10. Licensing:
BSD 3-Clause License (open source)

### 11. Latest Version / Release Date:
Version 2.3.1 (July 7, 2025)

### 12. Example Use Cases:
Financial data analysis and reporting
Scientific research data processing
Business intelligence and analytics
Web scraping and data extraction workflows

### 13. References:
**Official Website:** https://pandas.pydata.org
**Documentation:** https://pandas.pydata.org/docs/
**GitHub Repository:** https://github.com/pandas-dev/pandas

### 14. Other Links:
https://pandas.pydata.org/docs/getting_started/index.html - Official Getting Started Guide
https://www.kaggle.com/learn/pandas - Kaggle Pandas Micro-Course
https://github.com/pandas-dev/pandas/tree/main/doc/source/user_guide - User Guide Examples
https://pandas.pydata.org/pandas-docs/stable/user_guide/cookbook.html - Pandas Cookbook
https://realpython.com/pandas-python-explore-dataset/ - Real Python Pandas Tutorial
https://www.datacamp.com/courses/data-manipulation-with-python - DataCamp Course
https://pandas.pydata.org/pandas-docs/stable/reference/api/pandas.DataFrame.html - DataFrame API Reference
https://www.youtube.com/watch?v=vmEHCJofslg - Pandas Tutorial Video Series
https://github.com/pandas-dev/pandas/discussions - Community Discussions
https://stackoverflow.com/questions/tagged/pandas - Stack Overflow Q&A
https://pandas.pydata.org/pandas-docs/stable/user_guide/10min.html - 10 Minutes to Pandas
https://www.coursera.org/learn/python-data-analysis - University of Michigan Course
https://pandas.pydata.org/community/blog/ - Pandas Community Blog

https://github.com/justmarkham/pandas-videos - Video Tutorial Repository
https://pandas.pydata.org/pandas-docs/stable/user_guide/merging.html - Data Merging Guide
https://www.reddit.com/r/pandas/ - Reddit Community
https://pandas.pydata.org/pandas-docs/stable/user_guide/groupby.html - GroupBy Operations Guide
https://pythonprogramming.net/pandas-tutorial/ - Python Programming Tutorial
https://pandas.pydata.org/pandas-docs/stable/user_guide/visualization.html - Visualization Documentation
https://github.com/pandas-dev/pandas/blob/main/CONTRIBUTING.md - Contributing Guidelines