

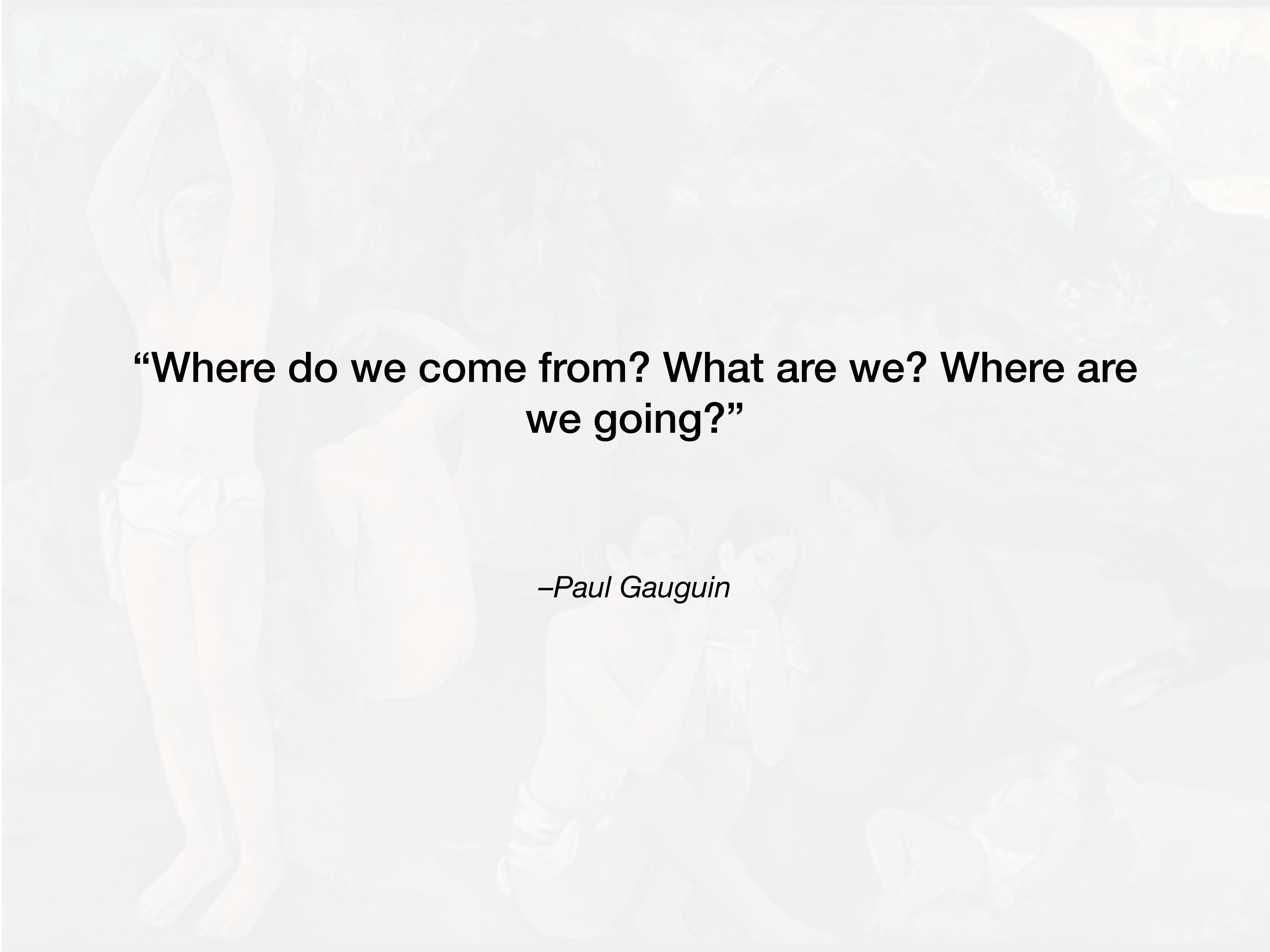
# Python Programming for Business Analytics



**NUS**  
National University  
of Singapore

**NUS**  
BUSINESS  
SCHOOL

# **What is Business Analytics?**

The background of the slide is a faded, light-colored reproduction of Paul Gauguin's famous painting, "Where Do We Come From? What Are We? Where Are We Going?". The painting depicts a group of Tahitian people in a lush, tropical setting. On the left, a young girl stands with her arms raised in a gesture of praise or prayer. In the center, a woman is shown from behind, bending over. To the right, a group of people are seated or lying on the ground, some looking towards the viewer and others looking away. The overall mood is contemplative and spiritual, reflecting the artist's interest in the origins and destiny of humanity.

**“Where do we come from? What are we? Where are we going?”**

*–Paul Gauguin*





**Where do we come from? What are we? Where are we going?**

Artist: Paul Gauguin

Location: Museum of fine arts, Boston

# Business Analytics

**“Where do we come from?”**

# Business Analytics

**“Where do we come from?”**

**Descriptive analytics:**  
Insights from historical data

- Business reporting
- Data visualization
- Data warehouse



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**“What are we?”**



# Business Analytics

## “Where do we come from?”

**Descriptive analytics:**  
Insights from historical data

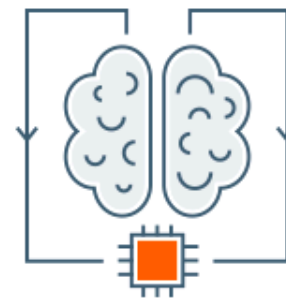
- Business reporting
- Data visualization
- Data warehouse



## “What are we?”

**Predictive analytics:**  
Current and future trends

- Statistics
- Econometrics
- Data mining
- Forecast
- Machine learning





# Business Analytics

**“Where do we come from?”**

**Descriptive analytics:**  
Insights from historical data

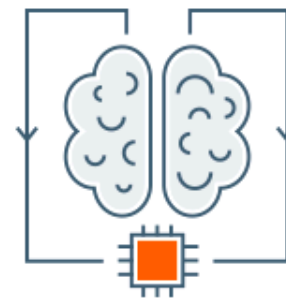
- Business reporting
- Data visualization
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**“What are we?”**

**Predictive analytics:**  
Current and future trends

- Statistics
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**“Where are we going?”**



# Business Analytics

## “Where do we come from?”

**Descriptive analytics:**  
Insights from historical data

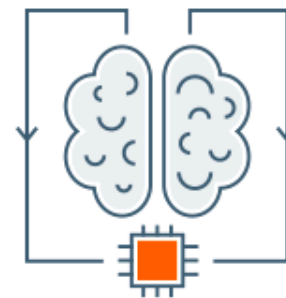
- Business reporting
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## “What are we?”

**Predictive analytics:**  
Current and future trends

- Statistics
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## “Where are we going?”

**Prescriptive analytics:**  
Data-driven decision-making

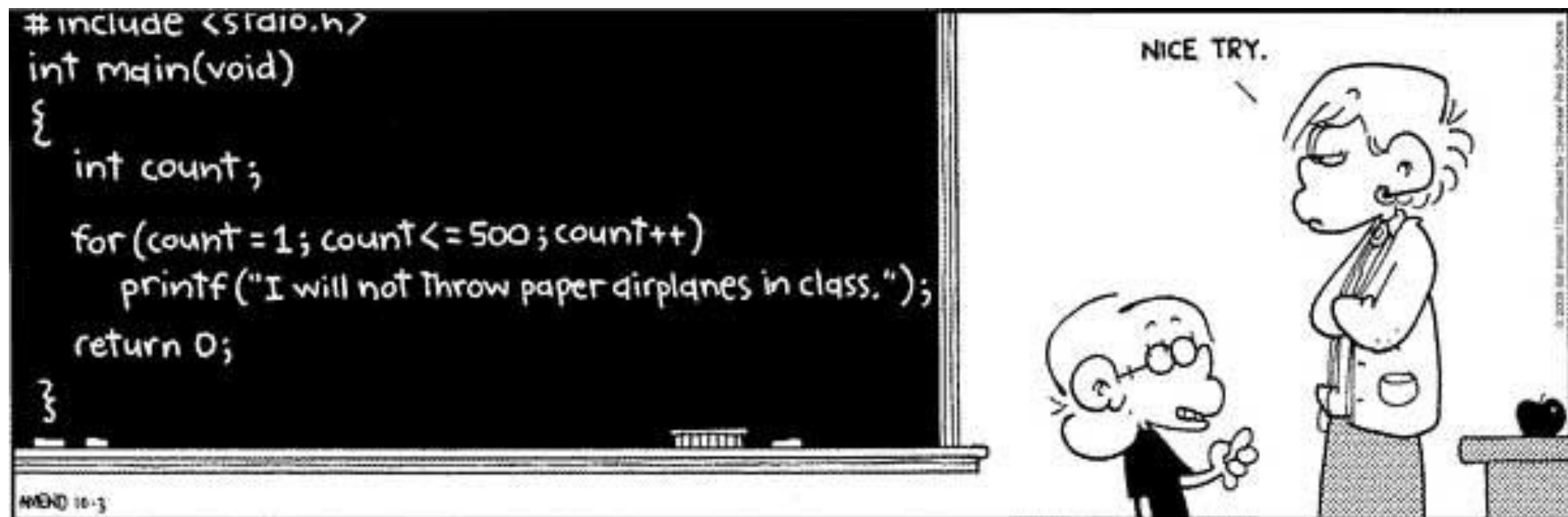
- Optimization
- Decision tree
- Simulations
- Expert system



# Why Python?

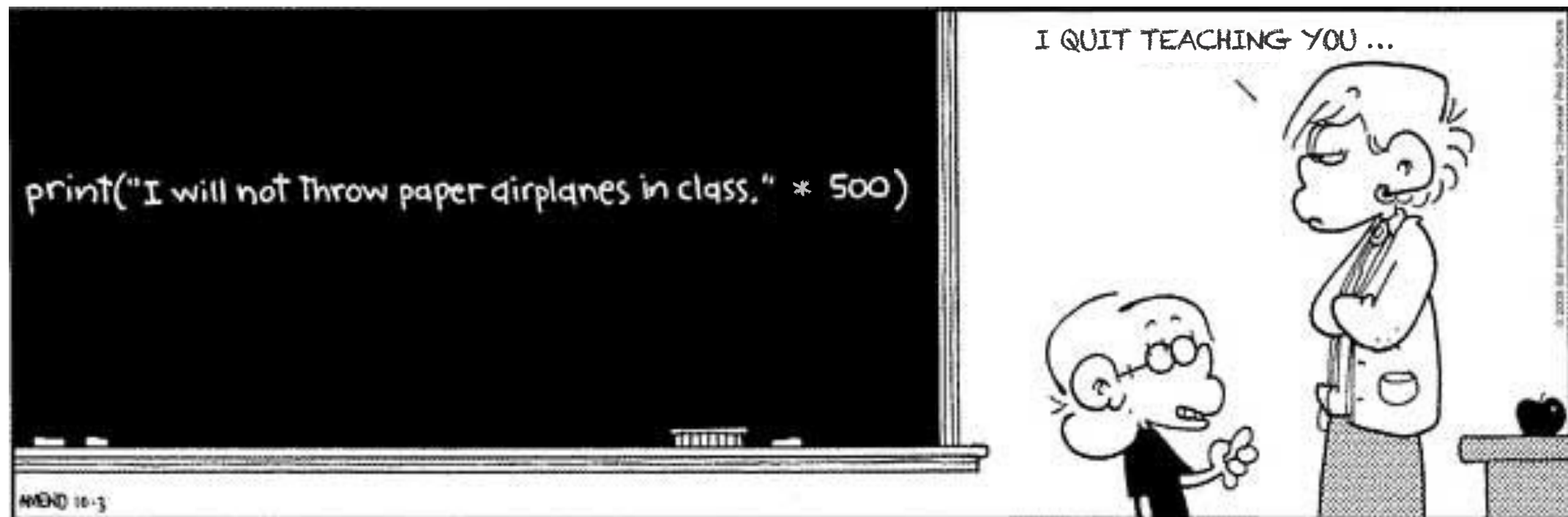
# Python is the Best

- Evolution of programming
  - C language (1980s)



# Python is the Best

- Evolution of programming
  - Python



# Python is the Best

- Evolution of programming
  - Python

If you ask Python programmers what they like most about Python, they will often cite its high readability. Indeed, a high level of readability is at the heart of the design of the Python language, following the recognized fact that code is read much more often than it is written.

```
In [1]: print("I will not throw paper airplanes in class.\n" * 500)
```

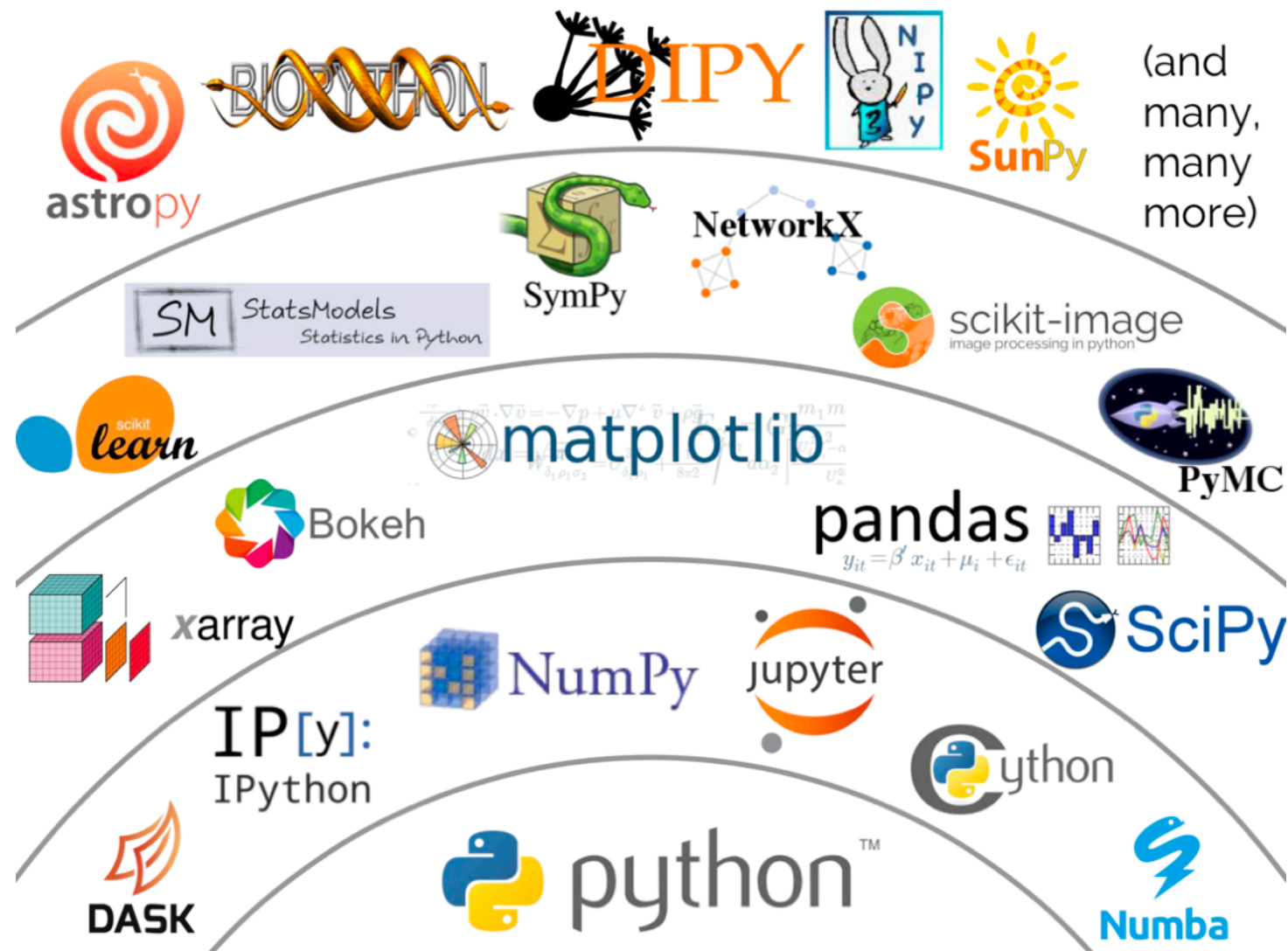
```
I will not throw paper airplanes in class.  
I will not throw paper airplanes in class.  
I will not throw paper airplanes in class.  
I will not throw paper airplanes in class.
```





# Python is the Best

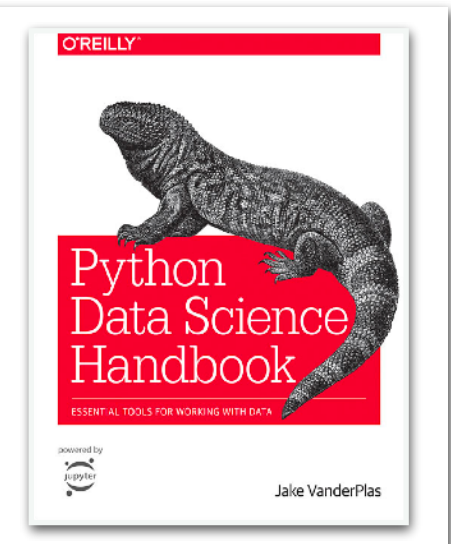
- The Python universe



# Python is the Best

- The Python universe

The usefulness of Python for data science stems primarily from the large and active ecosystem of third-party packages: **NumPy** for manipulation of homogeneous array-based data, **Pandas** for manipulation of heterogeneous and labeled data, **SciPy** for common scientific computing tasks, **Matplotlib** for publication-quality visualizations, **IPython** for interactive execution and sharing of code, **Scikit-Learn** for machine learning, and many more tools that will be mentioned in the following pages.



# Learning Materials

- Jupyter notebook files for learning and practice
- Jupyter notebook files for exercises
- Slides as supplementary materials

# Data Visualization Applications

- Map of the blue death
- How the circle line rogue train was caught with data