

Simple Slidev Sample

Slides that Illustrate Slidev's Features

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Technical Question

How do I connect mathematical terminology (e.g., *mapping*, *function*, *number*, *sequence*, and *set*), to the implementation of Python programs that declare and call functions and declare and manipulate variables?

Let's learn more about how the use of precise mathematical terms and concepts helps to effectively communicate and perform Python programming tasks! □

Hello World with Highlighting

```
# declare multiple variables
hello = "hello"
world = "world"
space = " "
value = .50
message = world + space + hello
print(f"The message is: {message}")
print(f"The value is: {value}")
```

Can you predict the output of this program?

Using a `mapper` with a Sequence

```
def square(value: int):  
    return value * value  
  
def mapper(f, sequence):  
    result = (  
        for element in sequence:  
            result += ( f(element), )  
    return result  
  
squared_range = mappper(square, range(10))  
print(squared_range)
```

Understanding the Monoid

- A monoid is an ordered pair (S, \otimes) for a set S and any binary operator \otimes that satisfies the following conditions:
 - **Type Preservation:** $\forall s_1, s_2 \in S, s_1 \otimes s_2 \in S$
 - **Associative Property:** $\forall s_1, s_2, s_3 \in S, (s_1 \otimes s_2) \otimes s_3 = s_1 \otimes (s_2 \otimes s_3)$
 - **Identity Element:** $\exists \epsilon \in S$, such that $\forall s \in S, \epsilon \otimes s = s$ and $s \otimes \epsilon = s$
- We often say that S is a monoid under \otimes with identity ϵ
- If this is confusing, a monoid is a generalization of strings and integers!
- If you know how strings behave in Python or Java then you understand the monoid — monoid describes “string-like” structures!

Average Computation with Multisets

$$O = ((o_1, \dots, o_n))$$

$$S = \sum_{o_i \in O} o_i$$

$$A = \frac{S}{|O|}$$

What is the meaning of $o_i \in O$?

Where does this exist in Python code?

Explore the use of the `sum` function in Python!

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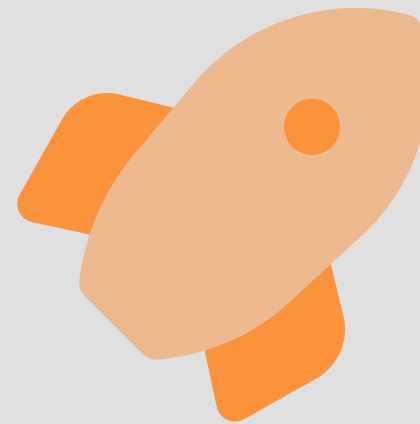
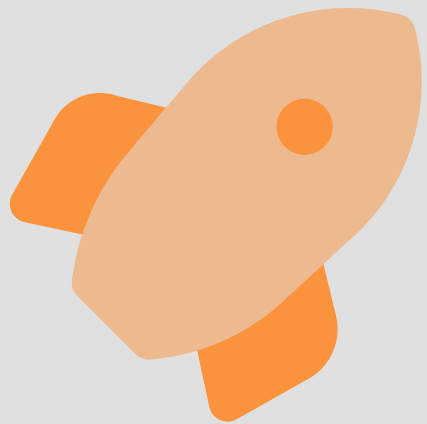
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Summary of the “Abstraction Jumping”

- What is the connection between the discrete mathematical structures and the Python programs?
- Connections between discrete mathematics and Python
 - **Generic file:** a sequence of sequences
 - **Names in the file:** a set of strings
 - **Emails in the file:** a set of ordered pairs forming a relation
 - **Temperatures in the file:** a multiset of integers
- When might the emails in the file be a mapping? When might the temperatures in the file be a sequence?

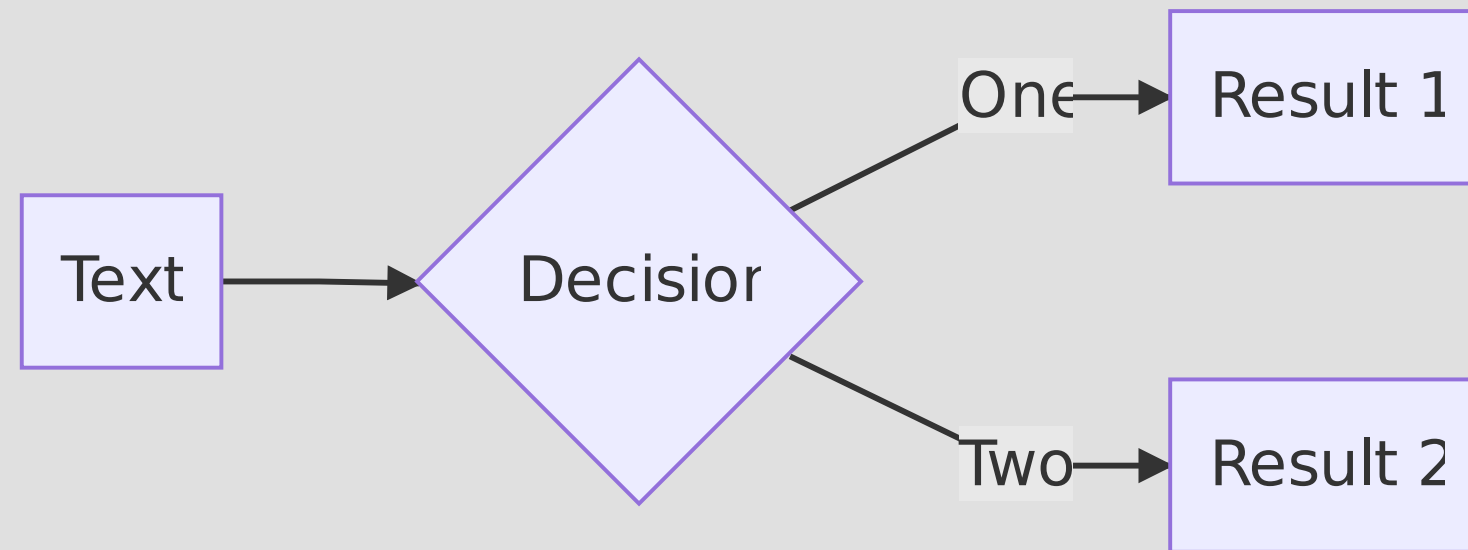
Simpler Slide with Bulleted List

- Item 1
 - Sub list
 - Sub list again
- Item 2
- Item 3
- Item 4

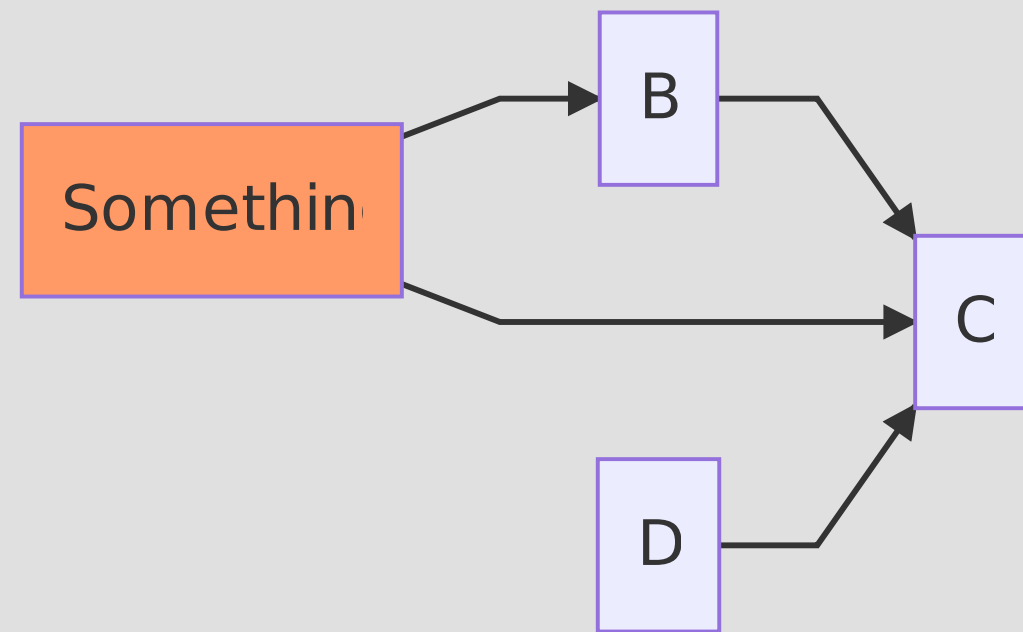
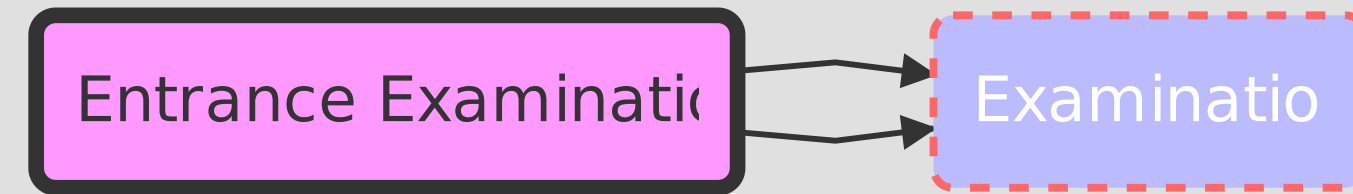
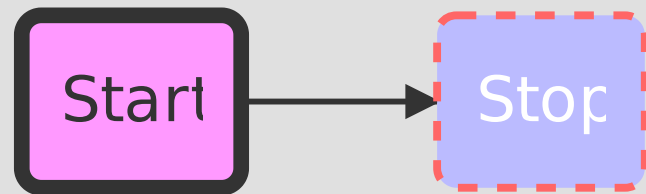


Simple slid with some math

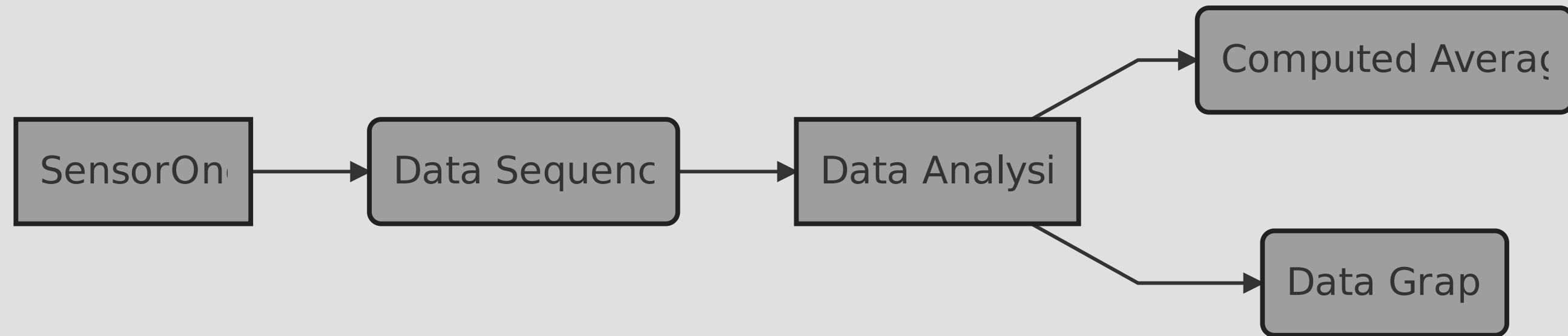
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Sample Diagrams in Mermaid

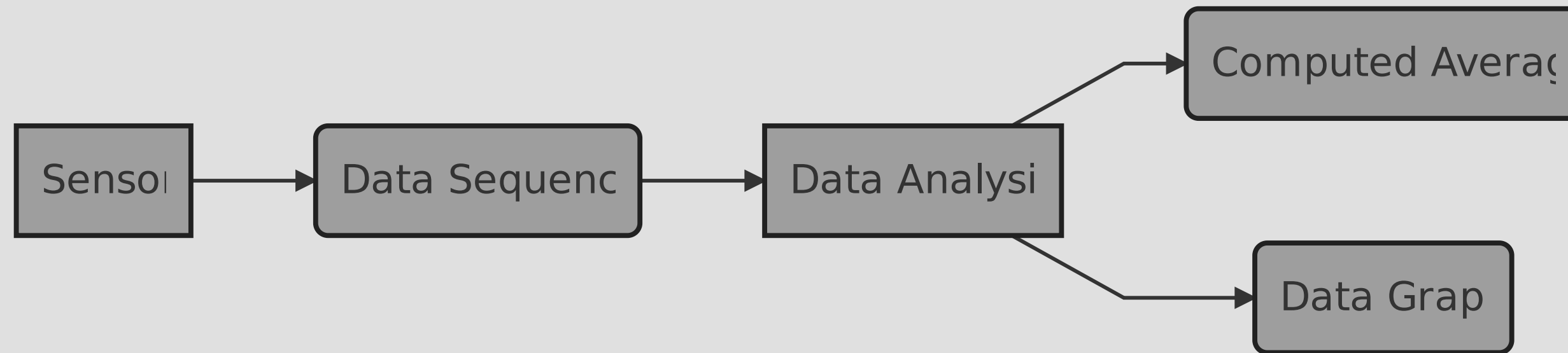


Additional Diagram Slide



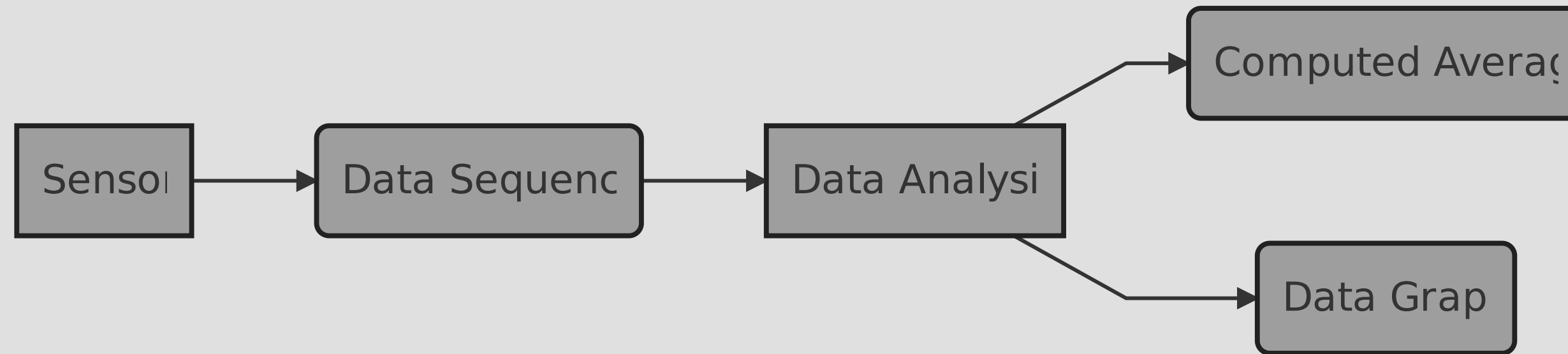
- What happens when I am typing a long message and I see some $f(x)$

Separate Diagram Slide Again



- What happens when I am typing a long message and I see some $f(x)$

Separate Diagram Slide Last



- What happens when I am typing a long message and I see some $f(x)$