

# Runtime systems Project vision statement

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## **Vision:**

The goal of *MetaMorph* is to create a simple toolkit that lets us inspect and compare runtime information across three major programming languages — C++, Java, and Python. By doing this, we aim to understand how each language represents objects, methods, and types at runtime, and what trade-offs exist in their runtime systems.

## **Purpose:**

While languages provide their own tools for reflection and runtime type inspection (like RTTI in C++, reflection in Java, and *inspect* in Python), there isn't a unified way to compare them. *MetaMorph* will collect this metadata through small programs in each language and present it through a single dashboard, allowing an easy side-by-side comparison.

## **Scope:**

The project will focus on:

- Extracting runtime metadata from small example programs in C++, Java, and Python.
- Building a lightweight Python dashboard to visualize and compare this data.
- Demonstrating differences in how the three languages handle runtime type information.