# Scala

## Lightweight Modular Staging

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Now that we are familiar with Scala…

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lets look at an awesome library implemented in Scala.

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Lightweight Modular Staging (LMS)

# LMS is..

‘A library-based multi-stage programming approach that uses types to distinguish between binding time.’

# Outline

- A gentle introduction to LMS
- Generative Programming
- Language virtualization
- Intermediate representation
- How do we program in LMS?

# A gentle introduction to LMS

## Power function in Scala

```
def power(b: Double, x: Int): Double =
  if (x == 0) 1.0 else b * power(b, x - 1)
```

## Power function in Scala LMS

```
trait PowerA { this: Arith =>
  def power(b: Rep[Double], x: Int): Rep[Double] =
    if (x == 0) 1.0 else b * power(b, x - 1)
}
```

# A gentle introduction to LMS

## What did we just see?

- `T` versus `Rep[T]`
- `def` versus `trait`

# Generative Programming

## What is generative programming?

## Commonalities of LMS and generative programming

## Differences of LMS and generative programming

# Language Virtualization

# Intermediate representation

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