# Architecture RISC-V

## CSCI 425 - Operating Systems Design

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# Introduction

## What is RISC-V

Instruction set architecture

Unlike x86, ARM RISC-V is open-source

# History

## Early 2010s

- RISC-V project born
- Built on decades of RISC research (RISC-I and II in 1981)

## 2011

First RISC-V chip created

## 2014

Publication of a paper on the benefits of open instruction

## 2015

Creation of the RISC-V foundation

# Design

## Simplicity

- Small, well-defined instruction set
- Emphasis on clear instruction encoding

## Modularity

- Base ISA
- Optional extensions

## Load/Store architecture

- Memory operations restricted to dedicated load/store instructions
- Simplifies the pipeline and improve efficiency

# Applications

## Embedded systems

- Microcontrollers for IoT devices, wearables, industrial control
- Meets power consumption requirements of space-constrained and battery-operated designs

## Mobile devices

- Handle the performance needed to power smartphones
- Can act as a co-processor for specialized tasks

## Automotive, High-Performance computing

- Handle complex computational tasks with customized ISAs
- RISC-V extensions: greater energy efficiency

## Aerospace and Government

Meets High reliability and security requirements

# Conclusion

## Objectives fulfilled?

Requirements correctly integrated in final product

## How to improve the app?

- Be able to download folders as zip
- Administrator mode to manage user access

# The End

Thank you for your attention!
Do you have any question?