Bern University
of Applied Sciences

Exercise - 01

Microcontroller Overview

Andreas Habegger | Adrian Steiner
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This exercise will give you a rough overview of microcontroller. Answer these questions. When you have completed the exercise, compare your results with those of your classmates and the course materials.

Objectives

- You can name the two most used microcontroller architectures.
- You can name at least three vendors/manufacturers of microcontrollers.
- You can set the characteristics requirements for a given application.

Outcomes

- Investigation of the microcontroller marked
- Overview of a microcontroller portfolio from a specific vendor
- Develop a sense of what is possible with a microcontroller
- Exposure to the wide range of applications for microcontrollers
- Gain a short but solid basic knowledge
- A summary of information

Description

A microcontroller is a computing device implemented on a single chip and encapsulated in a package to form an integrated circuit. As this definition is rather vague, there are several characteristics that help to classify a microcontroller. Your task is to explain the four main characteristics (architecture, memory, bit configuration and instruction set) in a scientific way and to draw a short conclusion in a more superficial way. Gather all the information you need from a quick internet search. Assemble the information and draw a conclusion.

Tasks

Exercise

Explain the four main categories of microcontroller categorization.

- architecture
- memory
- bit configuration
- instruction set architecture

Tip

For microcontroller classification, answer at least the following questions:

- What part of the microcontroller does the feature describe? (Hardware)
- What are the most common implementations of the feature? (at least two)
- How do these implementations differ?
- Give an example of a realization of the feature and its use.

Exercise

Pick a specific vendor. Analyze and compare its microcontroller product portfolio.

Question

- Which applications are targeted?
- Which peculiarities provides the microcontroller family compared to others?
- Why did you choose this vendor?

(optional) Summary report

Write a brief summary of the uses of a microcontroller. Explain how you would use the characteristics to help you select a microcontroller to use in a fictional target application.