Java the Bug Bites Back
Or: How to Build Your Own JavaCard Virtual Machine

Motivation
JavaCard is a subset of Java that is used for small security critical applications on Smartcards. The JavaCard Virtual Machine architecture is tailored for small microprocessors with tiny amounts of memory and little computational power. For the user, one major disadvantage of JavaCard Smartcards is that they are separate physical tokens, which have to be carried around. Modern mobile-phone application processors can host Trusted Execution Environments (TEEs), which in turn provide a foundation for building virtual Smartcards. Instead of carrying around tens of Smartcards in the pocket, it will suffice to just carry around your mobile phone. This is where you come in!

Project Description
Goals
• Understand the JavaCard Virtual Machine architecture
• Build a prototype JavaCard VM for use on an open-source TEE

Background
• Basic Java and good C programming skills
• Interest in operating system- and VM-level software development

Deliverables
• JavaCard VM prototype (source code in GIT repository)
• Documentation/Tech Report
• Presentation (15-20 Minutes)

Scope and Credits
Studies:  INF  SEW  TEL  MATH
Project for 1-2 participants. The scope, effort, and credits of this project are scalable.

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