

# Embedded Security Systems

## Laboratory Tasks 2

Deadline: 30.03.2017

### Task 1 (20%)

Install the Java Card Development Kit version  $\geq 2.2.1$  (see below) and compile a Hello World example (you can find an example source code here <http://sajithforu.blogspot.com/2014/10/java-card-helloworld-applet.html>).

**For Windows Users:** Follow the installation of JCDK 3.0.5 <https://docs.oracle.com/javacard/3.0.5/guide/installation.htm#JCUGC116>

**For Linux Users:** There are several ways to install the SDK. For example you can download the binary directly and use Ant <https://github.com/martinpaljak/ant-javacard>.

**For Mac Users:** Use a Virtual Machine with Windows or Linux.

### Task 2 (40%)

Install the applet on a simulator. You can use the simulator provided by the JCDK, i.e. CREF ([https://docs.oracle.com/javacard/3.0.5/guide/debugging\\_applications.htm#JCUGC237](https://docs.oracle.com/javacard/3.0.5/guide/debugging_applications.htm#JCUGC237)) or by using jCardSim (<https://jcardsim.org/docs/quick-start-guide-simulator-api>), which simulates the JC API for standard Java. Use the APDU command

```
CLA = 0x80
INS = 0x00
P1 = 0x00
P2 = 0x00
Lc = 0x00
Le = 0x00
```

and investigate the output from the simulator.

### Task 3 (15%)

Change the Hello World example in such a way that on instruction `INS = 0x10` the applet outputs the string `Embedded Security Systems`.

### Task 4 (25%)

Change the Hello World example in such a way that on instruction `INS = 0x20` the applet returns the reversed data field of the APDU command, e.g. the applet should return `0x04030201009000` for the command `0x8020000005000102030400`.