CAD Design Project 3 – Boolean Optimization with *Espresso*
Due: 23:59, Oct. 26, 2022

The *Espresso* is a software package developed at IBM for two-level Boolean function minimization in 1982. The *Espresso* is then integrated into the most famous logic synthesis engines, *SIS* and *ABC*, at UC Berkeley in 1992 and 2005, respectively. The *Espresso* adopts positional cube notation – a binary encoding technique to process Boolean cubes, a.k.a. implicants and product terms. Combined with the unate recursive paradigm (URP), we are capable of implementing primitive Boolean operations efficiently for 2-level and multilevel logic synthesis. In this project, you are required to study the open-source *Espresso* package and to write a report upon this classical two-level logic minimizer:

1. Use typical benchmark examples to execute the *Espresso* package.
2. There are many options for the tool, evaluate them as many as possible. You might have to generate some PLA test cases for dedicate options.
3. Write a comprehensive study report for this two-level logic minimization tool.

Reference:

[1] *Espresso* logic minimizer (Source code)

URL: https://github.com/psksvp/espresso-ab-1.0

[2] *Espresso*: A Multi-valued PLA minimization (Documentation)

URL: https://ptolemy.berkeley.edu/projects/embedded/pubs/downloads/espresso/index.htm

[3] PLA format description

URL: https://ddd.fit.cvut.cz/www/prj/TT-Min/pla.html