

UIC ECE464 (Fall 2019)

Project 3: Your own design of study and report on combination and sequential circuits

In this project, you design your own experiments to examine the fault coverage (of pseudo-random TV) for combinational circuits and sequential circuits.

Q1: (40 pts) combinational circuit study report:

comb_report.pdf

a) (20pts) Main goal and experiment design

Is the main question a worthy (and interesting) goal of investigation, and clearly described?

Is the experimental design conforming to the goal and specified in detail?

b) (20pts) Data collection, presentation, explanation, and interpretation

Is the quality and quantity of the collected data sufficient for the main goal?

Are they presented in an easy-to-understand fashion with tables or charts?

Does the explanation of the data make sense and provide insights of understanding?

What's the overall quality of the conclusion drawn with the data?

Q2: (20 pts) sequential circuit simulator:

p3sim.py

Your simulator should be able to perform simulation of a sequential benchmark according to the user's input of (t, n, f), assuming:

- the TV **t** will be applied constantly for all **n** cycles,
- all FF's are initialized with UNKNOWN

Specific UI of the simulator:

- 1) prompt the user to input a bench file (default: circ.bench)
- 2) prompt the user to input a TV t in integer (default: t=0)
Note: you should support negative integers with t=-1 for a TV with all 1's, t=-2 for a TV of 1111...110, etc
- 3) prompt the user to input cycle number n (default: n=5)
 - output circuit simulation result for good circuit
- 4) prompt the user to input a fault f (default: the first input line of the bench circuit stuck-at-0)
 - output fault simulation result

Simulation result should include the content of all FF's, and values on the primary output.

Format of the output is up to your design, either in screen or an output file, and a good output style is worth 20% of the points.

Q3: (40 pts) sequential circuit study report:

seq_report.pdf

a) (20pts) Main goal and experiment design:

How “ambitious” is the main goal to be investigated? i.e., how much “more work” needs to be done beyond the simulator’s basic functionality?

Is the experimental design conforming to the goal and specified in detail?

b) (20pts) Data collection, presentation, explanation, and interpretation

Is the quality and quantity of the collected data sufficient for the main goal?

Are they presented in an easy-to-understand fashion with tables or charts?

Does the explanation of the data make sense and provide insights of understanding?

What’s the overall quality of the conclusion drawn with the data?

Notes:

- Sequential circuit benchmark can be found at:
 - https://github.com/raowenjing/ece464_p0/tree/master/seq_circ_bench
- Your reports should be in PDF format, with source written in LaTeX on overleaf.
- Work with your assigned group, but be responsible for your own submission.
 - Members in the same group can submit the same content, but across group is considered plagiarizing.
 - Members in the same group can also submit their own work different from others in the same group.
 - This project counts toward 15% of your final grade.
- When evaluating, provide detailed feedback:
 - Input files and parameters used for testing the python program, and the results
 - Reasons for deducting points
 - Comments on remarkable efforts and performances
- The overall grading of this project consists of
 - 20% from peer assessment (subtracting min and max)
 - 20% your grading efforts
 - 60% from instructor grading, which will take into consideration GitHub data for contribution to the group work.

Deadlines: (Late submission / evaluation will NOT be accepted by Bb)

- Submission Deadline: week 14 Sun (Nov 24th) 11:59:00 PM
- Evaluation Deadline: week 15 Mon (Dec 1st) 11:59:00 PM