Extension: Branch Prediction

Specifications

Extension Description

- Main Goal
  - Add a branch prediction unit (BPU) to implement the dynamic branch prediction scheme
- Details can be found in "Branch_Prediction.pdf"
- More information can be found online!

Test Program Generation

- In file “generate”:
  - BrPred_generate.py/ipynb(jupyter)
    - Python (version = 3.x)
    - argv[1] = nb_notBEQ, argv[2] = nb_interBEQ, argv[3] = nb_BEQ
    - I_mem_BrPredref & TestBed_BrPredref should be placed in the same folder
    - **I_mem_BrPred** & **TestBed_BrPred** will be generated
      - Provieded files a1b2c3
- +**define+BrPred** in ncverilog simulation command

Comparison Metrics

- Base on the test program
  - "I_mem_hasHazard" and ""I_mem_BrPred"
- Score 1 (BP_S1): Total execution cycles of I_mem_BrPred
  - BP_S1 = total cycle counts of the I_mem_BrPred
- Score 2 (BP_S2): Total execution cycles of I_mem_hasHazard
  - BP_S2 = total cycle counts of the I_mem
- Score 3 (BP_S3): Synthesis area of BPU (um^2)
  - BP_S3 = area of BPU

Some Possible Discussion

- Design methodology for good score (before/after)
- The relationship between design BPU and parameter size for generating test program