Csc656 Computer Organization and Architecture
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Project 1b
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System One:

To Compile : **make**
or   **javac sys1.java   Predictor.java**

To Run :   **java sys1 SP17/test.trace   -v**

```
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ make
 javac -g sys1.java
 javac -g DynamicPredictor.java
 javac -g sys2.java
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys1 S17/test.trace -v
 18244 1 18338 1
 1838c 1 18338 1
 1838c 1 18338 1
 1838c 1 18338 0
 18244 1 18338 1
 1838c 1 18338 0
 1838c 1 18338 1
 1838c 1 18338 0
 18004 1 1808c 1

 Number of branches = 9
 Number of forward branches = 3
 Number of forward taken branches = 3
 Number of backward branches = 6
 Number of backward taken branches = 3
 Number of mispredictions = 6 0.6666667
```

System Two:

To Compile : **make** (optional)
or   **javac sys2.java   DynamicPredictor.java** (optional)

To Run :   **java sys2 SP17/test.trace   16   4   -v**

```
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys2 S17/test.trace 16 4 -v
 0 1 1 2 1 1824 0 0
 1 3 1 2 3 1838 0 0
 2 3 2 3 3 1838 1 0
 3 3 3 2 3 1838 2 0
 4 1 2 3 1 1824 3 0
 5 3 2 1 3 1838 4 0
 6 3 1 2 3 1838 4 0
 7 3 2 1 3 1838 5 0
 8 1 3 3 1 1800 6 1

 Number of branches = 9
 Number of forward branches = 3
 the number of forward taken branches = 3
 Number of backward branches = 6
 Number of backward taken branches = 3
 Number of mispredictions = 6 0.6666667
 Number of BTB misses = 1 0.16666667
```

Measurements and results

li1	# mispredictions	Misprediction rate	# BTB misses	BTB miss rate
System 1	29436	0.4801096	N/A	N/A
System 2 (N=256,M=64)	8400	0.13700642	8187	0.2214079
System 2 (N=1024,M=256)	6606	0.10774575	2290	0.06159391

```
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys1 S17/li1.trace

Number of branches = 61311
Number of forward branches = 48736
Number of forward taken branches = 27420
Number of backward branches = 12575
Number of backward taken branches = 10559
Number of mispredictions = 29436 0.4801096
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys2 S17/li1.trace 256 64

Number of branches = 61311
Number of forward branches = 48736
the number of forward taken branches = 27420
Number of backward branches = 12575
Number of backward taken branches = 10559
Number of mispredictions = 8400 0.13700642
Number of BTB misses = 8187 0.2214079
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys2 S17/li1.trace 1024 256

Number of branches = 61311
Number of forward branches = 48736
the number of forward taken branches = 27420
Number of backward branches = 12575
Number of backward taken branches = 10559
Number of mispredictions = 6606 0.10774575
Number of BTB misses = 2290 0.06159391
```

li2	# mispredictions	Misprediction rate	# BTB misses	BTB miss rate
System 1	34901	0.53774095	N/A	N/A
System 2 (N=256,M=64)	9402	0.14486234	13146	0.29425195
System 2 (N=1024,M=256)	6593	0.10158236	4000	0.08967202

```
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys1 S17/li2.trace

Number of branches = 64903
Number of forward branches = 44624
Number of forward taken branches = 29310
Number of backward branches = 20279
Number of backward taken branches = 14688
Number of mispredictions = 34901 0.53774095
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys2 S17/li2.trace 256 64

Number of branches = 64903
Number of forward branches = 44624
the number of forward taken branches = 29310
Number of backward branches = 20279
Number of backward taken branches = 14688
Number of mispredictions = 9402 0.14486234
Number of BTB misses = 13146 0.29425195
[Hasans-MacBook-Pro:NiftiyevHasan-csc656-Project1b Ditdo$ java sys2 S17/li2.trace 1024 256

Number of branches = 64903
Number of forward branches = 44624
the number of forward taken branches = 29310
Number of backward branches = 20279
Number of backward taken branches = 14688
Number of mispredictions = 6593 0.10158236
Number of BTB misses = 4000 0.08967202
```