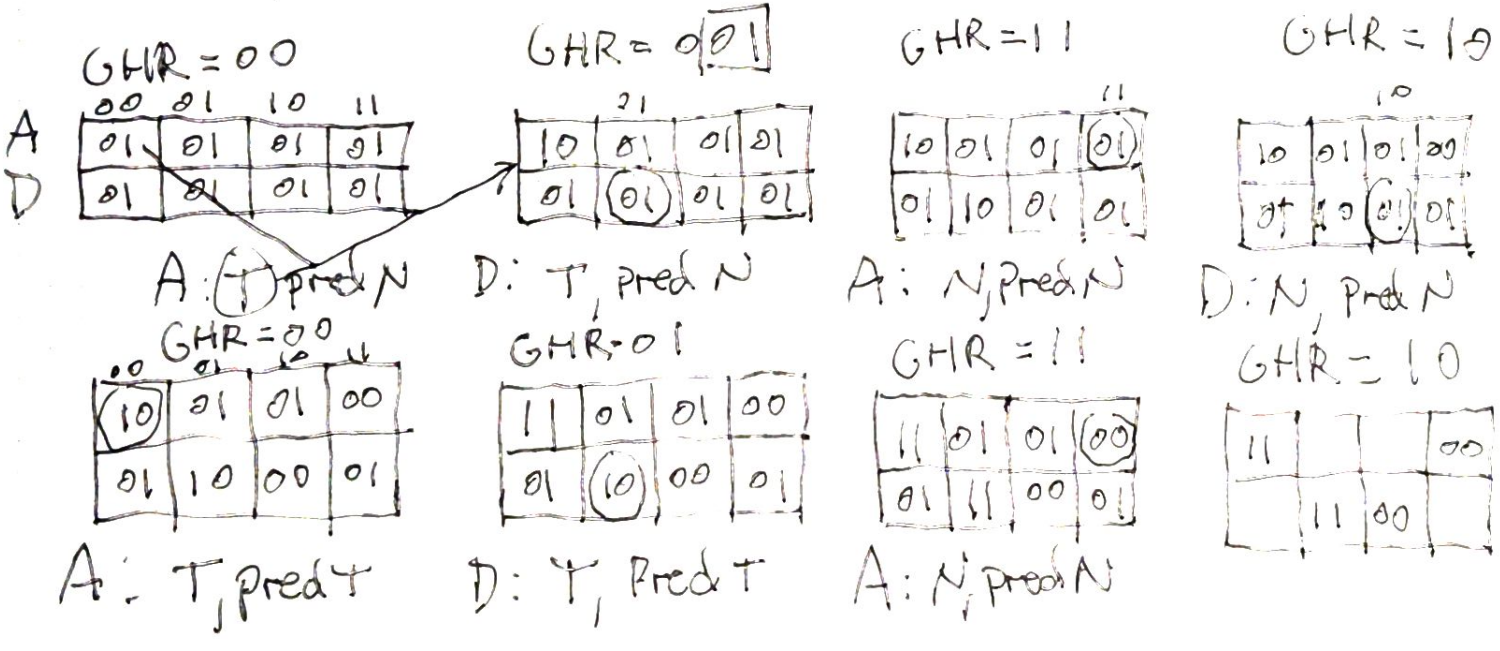
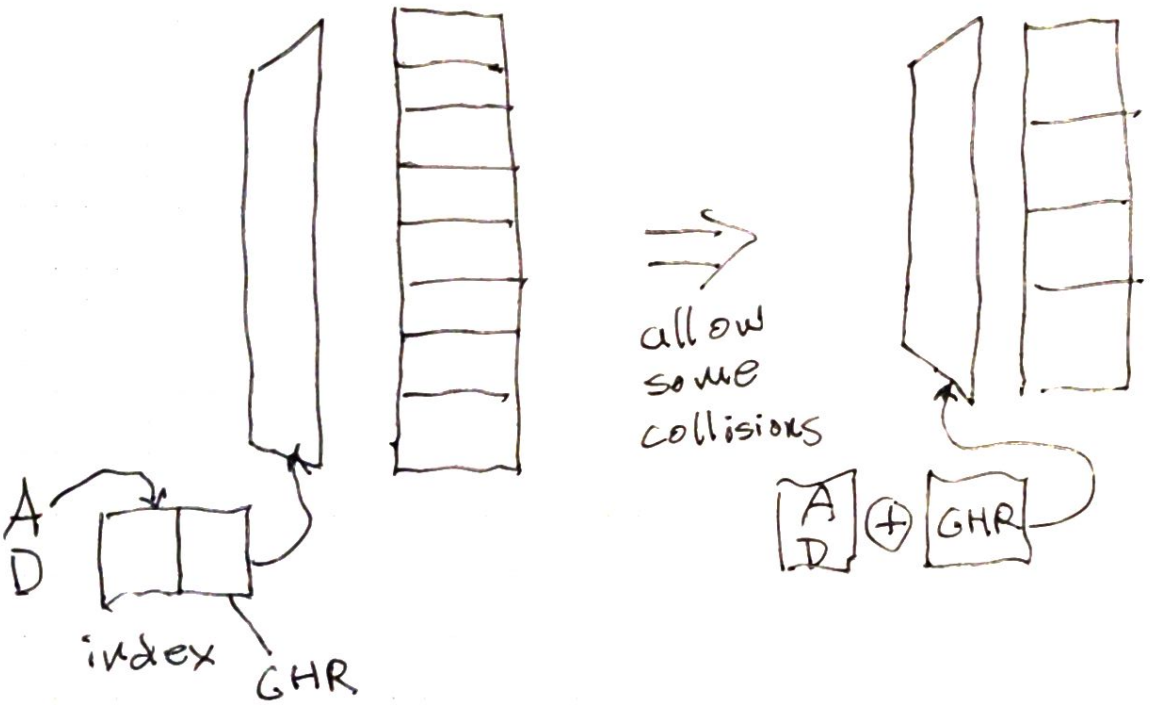
Feb 13

G select

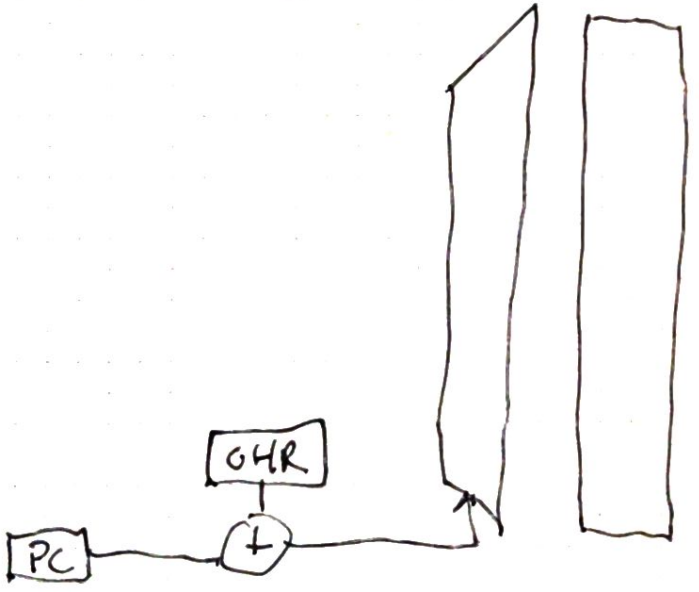
```
R1=0
Loop: :
      :
A  BREQZ R1, D
   .
   .
D  BREQZ R1, F
F: NOT R1,R1
   BR Loop
```

2-entry GHR.

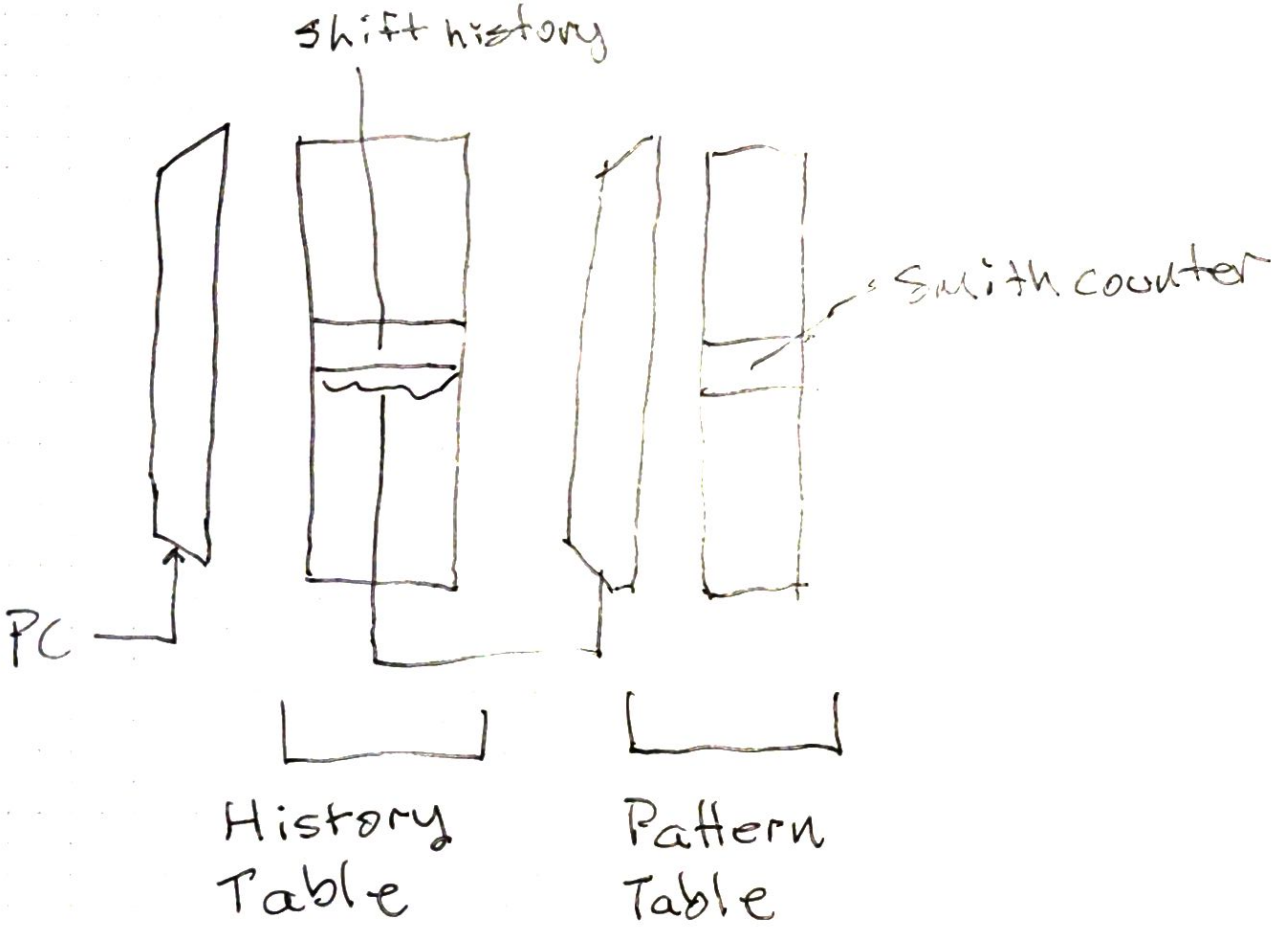




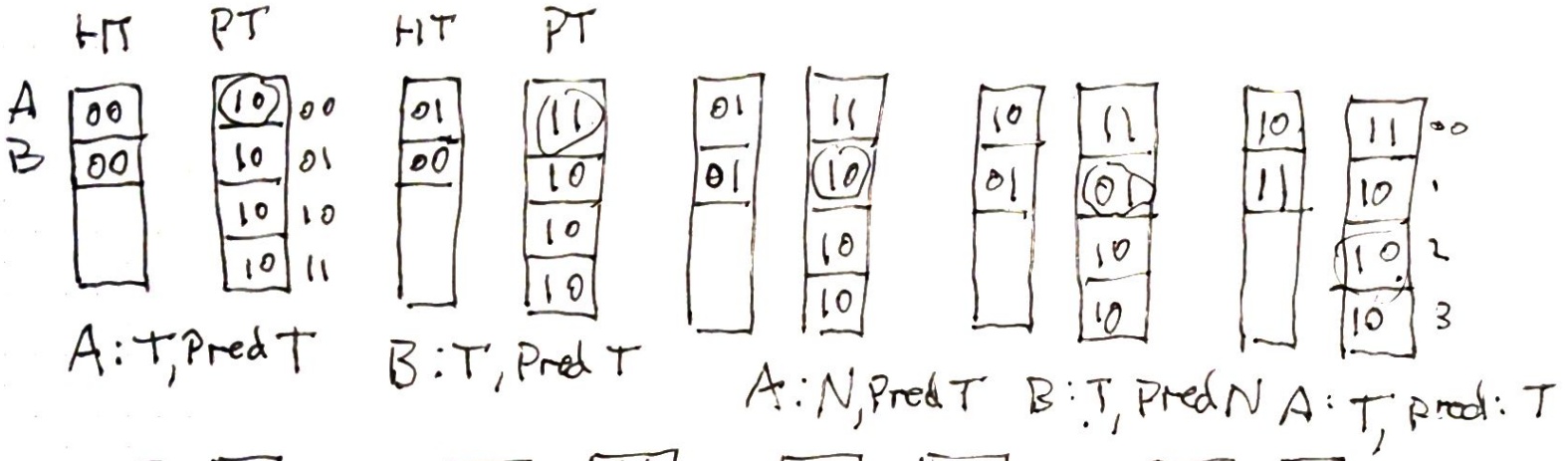
Gshare

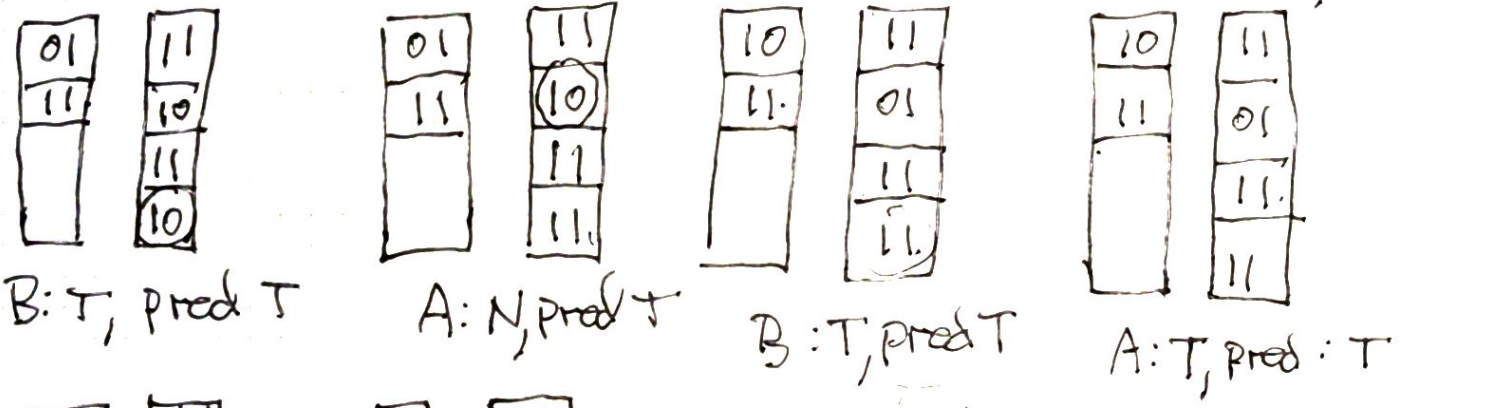


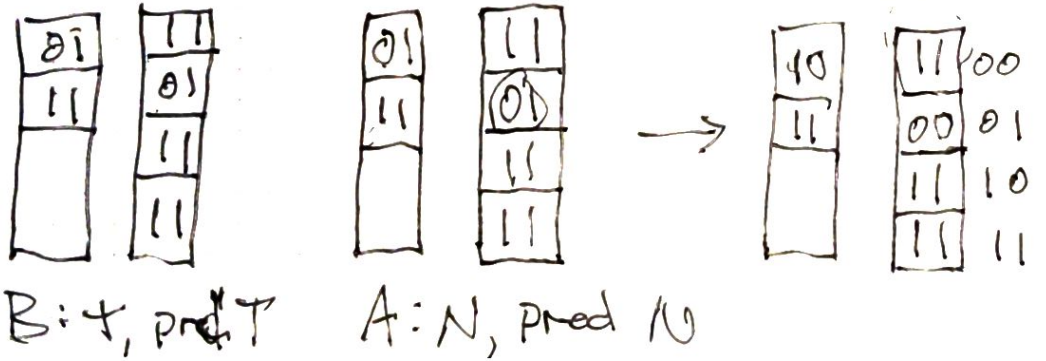
Yeh - Patt


shift history
Smith counter
PC
History Table
Pattern Table

A: T N T N T N T N ...
B: NT T T T T T T







CPI = 1 + stalls

predictor is 90% accurate

1:5 is a branch 20%

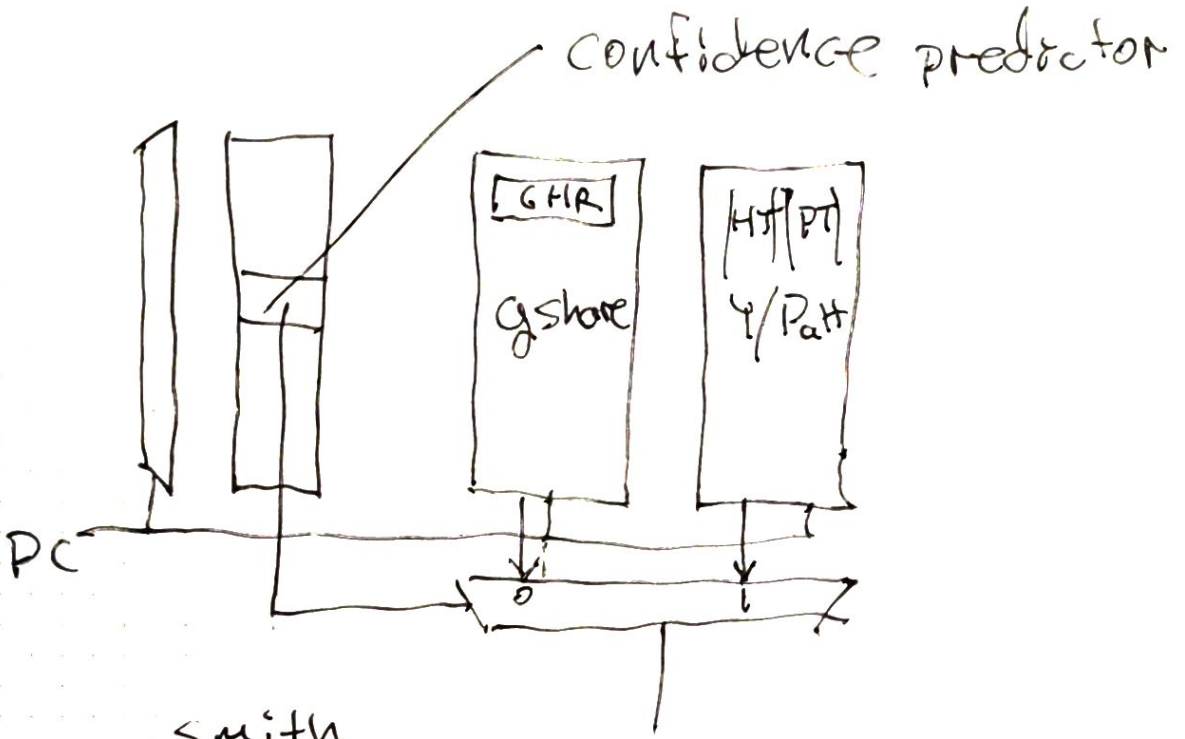
penalty for misprediction = 3 cycles

$CPI = 1 + 0.2 \times (1 - 0.9) \times 3$

$= 1.06$

CPU time = IC × CPI × CT

Branch prediction accuracy determins pipeline depth



smith counter, inc if Y/PaT was correct
dec if gshare " "

0	0
0	1
1	0
1	1