Branch Predictors
First some motivation

- Branch prediction is necessary because of Instruction Pipelining
- Without branch prediction the pipeline would stall until the condition was decided
- The cost of a misprediction is proportional to the length of the pipeline
Static and ‘last time’ strategies

- Static prediction
- Last time predictor
- Saturating counter
Correlating Strategies

- Two-level adaptive predictor
- Local
- Per branch history register
- PC indexes the correct history register
Correlating Strategies

• Global

if (cond1)
...
if (cond1 && cond2) first not taken =>
second not taken
____________________________
if (aa==2) aa = 0; // B1
if (bb==2) bb = 0; // B2
if (aa!=bb) { ... } // B3
// if B1 and B2 not taken (i.e. both fall through) => clearly B3 must be taken (i.e. will
jump past the block
Correlating Strategies

- Hybrid
- Combination of different strategies. (use the best)
- Meta predictor to decide which to use.