2007 Paper 7 Question 1

Comparative Architectures

(*a*) Why is branch prediction so important in modern processors? [2 marks]

(*b*) Why are saturating, two-bit counters used? [2 marks]

(*c*) How does a local branch predictor operate? [2 marks]

(*d*) How does a global branch predictor operate? [2 marks]

(*e*) How may local and global branch predictors be used together? [3 marks]

(*f*) Give an example sequence of branches that will fail to be completely predicted with a branch history of four. [3 marks]

(*g*) How can the compiler assist with branch prediction? [3 marks]

(*h*) Suggest methods for jump prediction. [3 marks]