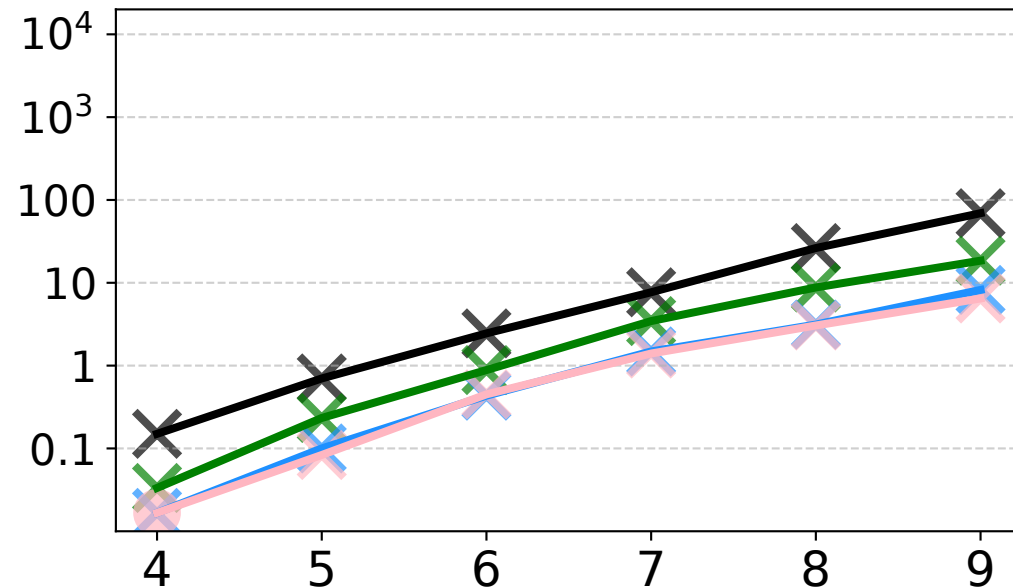
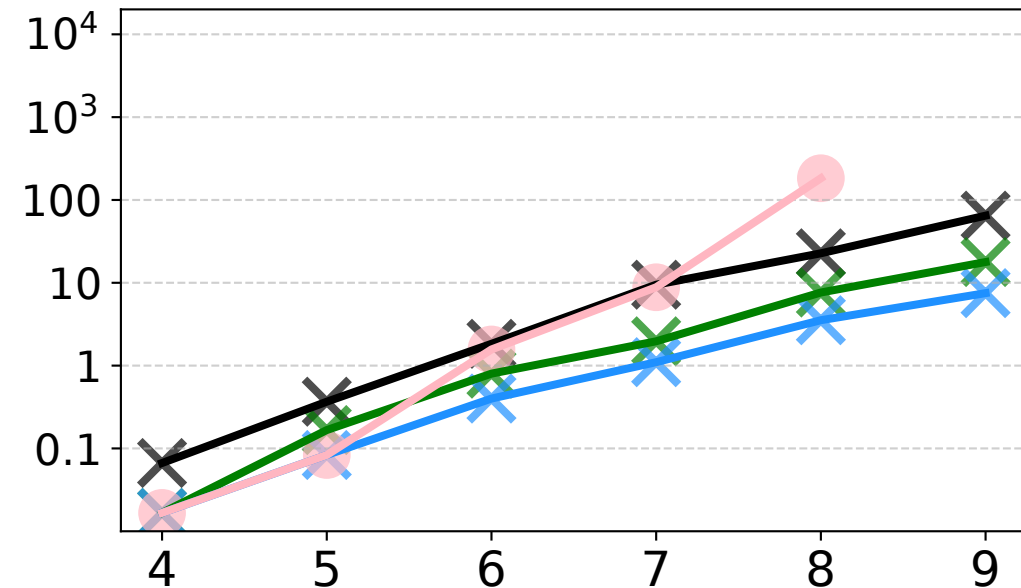


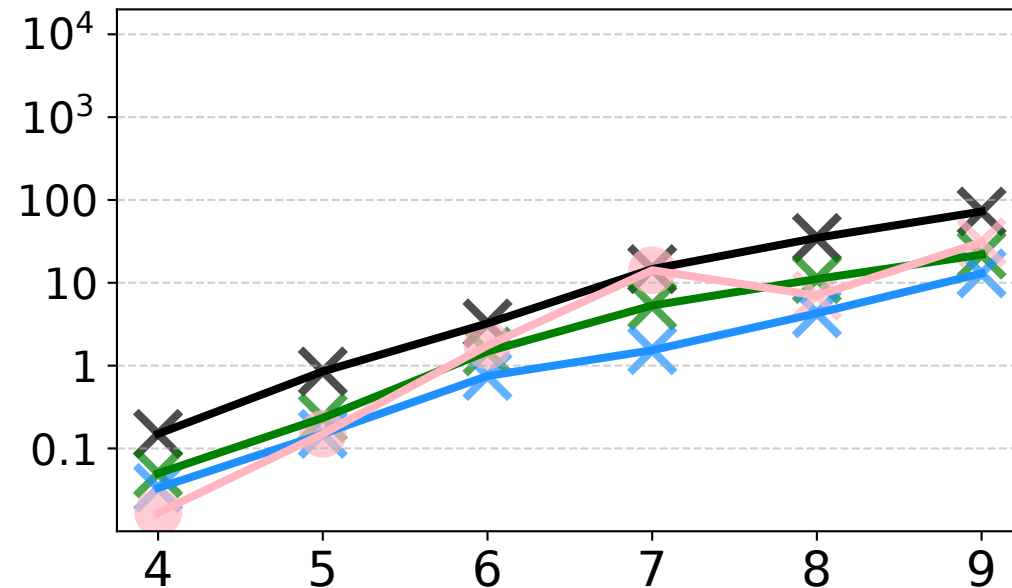
Checking Time (min)



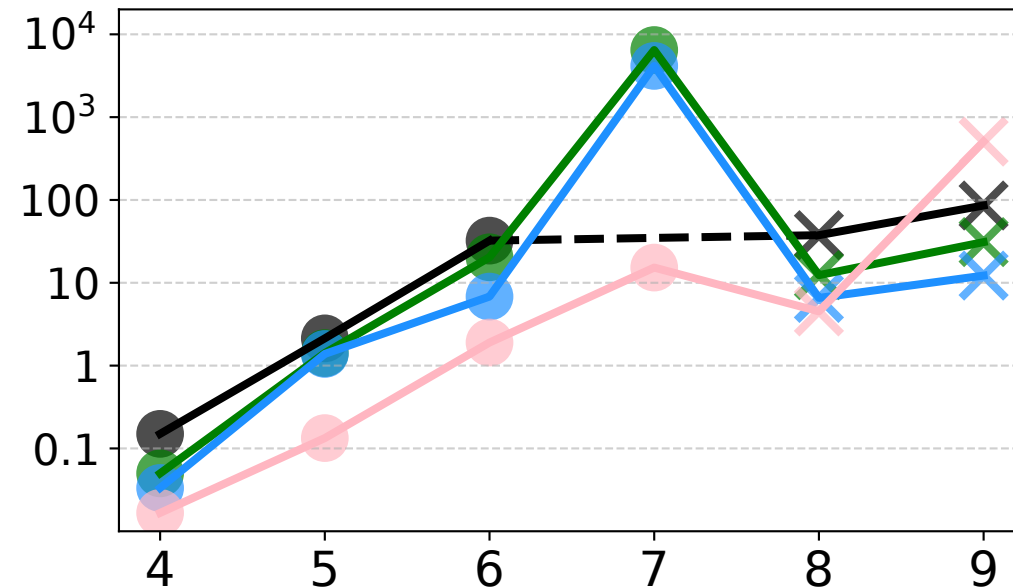
**(a) Baseline O3 Processor**



**(b) Delay-on-miss**



**(c) Invisible Speculation**



**(d) GhostMinion**