

1. (2 points) AMAT

The Average memory access time (AMAT) is the average (expected) time it takes for a memory access considering both hits and misses. Let t_h denote the hit time, m denote the miss rate, and t_m denote the miss penalty. AMAT can be calculated using the formula:

$$AMAT = t_h + m \cdot t_m .$$

The miss rate is the percentage of memory accesses that are not in cache. The miss penalty is the additional time it takes for memory access to the next higher level in the hierarchy.

Suppose you only have a level 1 cache, and that level 1 cache hits in 1 clock cycle with a miss rate of 4%. The cost to access main memory (the miss penalty) is 57 clock cycles. Using the formula above, state the AMAT below. Show your work. You will only receive one point by just providing the answer.

$$\begin{aligned} \text{AMAT} = & 1 + (0.04) \cdot 57 \\ & 1 + 2.28 \\ & 3.28 \end{aligned}$$