

Expert: **AAATom**

Customer:

Hello!

I am working on this one now.

Customer:

Sorry it took so long, the kid woke up :)

Here is the answer:

a. What is the average access time of the system considering only memory read cycles?

Average access time for memory read in the system is calculated using formula:

$$\text{average_access_time_read} = \text{hit_ratio} \times \text{cache_access_time} + (1 - \text{hit_ratio}) \times \text{main_memory_access_time}$$

so in this case:

$$\text{average_access_time_read} = 0.9 \times 100\text{ns} + (1 - 0.9) \times 1000\text{ns} = 90\text{ns} + 100\text{ns} = 190\text{ns}$$

b. What is the average access time of the system for both read and write requests?

If we take in account both read and write accesses then we have to sum averages for read and write.

Read average would take those 80% of overall requests and the average read access time of 190ns we calculated in a) to get 0.8×190 .

Write average would take those 20% of overall requests and the main memory access time of 1000ns to get 0.2×1000 ns.

Summed together we get: $0.8 \times 190\text{ns} + 0.2 \times 1000\text{ns} = 152\text{ns} + 200\text{ns} = 352\text{ns}$.

c. What is the hit ratio taking into consideration the write cycles?

To take into consideration write cycles means that we should discard write requests from the given overall hit ratio.

So we have $\text{hit_ratio_read} = \text{read_requests_percentage} \times \text{hit_ratio} = 0.8 \times 0.9 = 0.72$

Again, if you need more explanation I am here for you.

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Expert: **AAATom**

I can see that you have accepted the other two questions (thank you and thank you for the bonus for question 4) - is there something I can do more on this question?

(I have switched this out of chat so I can get an email notification that you posted a reply.)

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