

Assignment 03 - Comments

The average score is 52.6/70.

1. 30 points

Note that $1s=10^3ms=10^9ns$.

The hit ratio of main memory, 0.6, means that if the system tries to fetch a word from the main memory, then it will succeed with a possibility of 60%. The event of the miss of a word in cache is implied when we talk about a miss or hit in main memory.

Some people are confused about which of the following formulae should be used:

$$T = T_1 \times H + T_2 \times (1 - H)$$

$$T = T_1 \times H + (T_1 + T_2) \times (1 - H)$$

Although I once gave an example in class using the first one instead of the second that is used in the textbook, I also made it clear that choosing which formula relates to the way in which the processor, the cache, and the main memory connect to each other. There is no ambiguity in this problem since it is stated clearly that if a miss occurs, a specific amount of time is needed for the system to load the target word to the cache first. So the way to compute the average time required to access a referenced word is: $20 \times 0.9 + (20 + 60) \times (1 - 0.9) \times 0.6 + (12 \times 10^6 + 60 + 20) \times (1 - 0.9) \times (1 - 0.6) \approx 4.8 \times 10^4$ ns

2. 40 points

The following issues are expected to be included in your brief introduction:

- Definition
- What is the benchmark used for?
- Why is it introduced?
- How should a benchmark score be interpreted?
- What are the principles of designing a benchmark?
- Examples
- What are the drawbacks of this method? Or what kind of improvement is possible?
- References

Your score depends on how much of the above issues is covered in your discussion. Normally four of the above is enough for you to have a full score.