CS2323 LAB 7 REPORT

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In this assignment we implemented cache simulation to identify which accesses would cause a cache hit and which accesses would cause a cache miss when an assembly program is executing. So we just added the implementation of the cache in the previous Lab Assignment - 4 alongside with the simulator.

To implement cache simulation to the simulator first we defined various structs like Cacheline struct , Cacheset struct, and finally cache struct. The structs have all the necessary attributes for the implementation.

There are various functions like initialise_cache function which allocates memory using malloc and calloc and returns a pointer to the Cache. Access_cache function does all the major work for the cache simulation like maintaining the number of hits, misses and accesses .

It also takes care of all the write policies and memory is accordingly updated wrt to all the policies checking whether it is a write access or read access .

The implementation is a little weird since our simulator already directly updates the memory with correct values , we invalidate the memory in the places wherever it is needed.

Log_access_cache function appends the data of the cache access for a particular access and appends that data to a filename.output file.
All the functionalities that were asked to be implemented have been implemented using various appropriate functions.

Limitations :

1. Our code is very sensitive to the syntax so the syntax needs to be correct . For example lui instruction needs to have a decimal immediate

and all immediates should be in decimal form only(taken from assembler).
2. In the input file all the lines must start from the first character itself. If the first character is “ ” then the parsing fails. The same thing happens if there is an empty line.
3. If an incorrect breakpoint is given then it is not handled correctly.
4. The limitations for values of .dword,.word,.byte,.half have not been applied.
5. The input.output file needs to be empty since we append the log data to the .output file

Difficulties Faced:

The main problem we faced was during the function access_cache because it does all the major functionality of the cache . The problem was that at first we were not storing the data in the cache so when we tried changing it we faced problems.