Let's say we have a database with 8,973 entries. Each contains:

- Name: char array – Up to 50 characters
- Department: char array - Up to 12 characters
- Section: char array - Up to 8 characters
- Additional: char array - Up to 50 characters
- GPA: double
- ID: Unsigned integer

Determine the amount of memory consumed storing these entries on a Disk with block of 512 bytes using both segmentation and paging. Draw the layout of the first three blocks for each.

Given a Direct-Mapped Cache with 8 words and the address references and the address references representing the tag and index: 22, 26, 22, 26, 16, 3, 16 and 18, and show the sequence for accessing the cache. Assume that the cache is initialized as empty. Draw the final cache table

Given a 2-way Set Associative Cache with 8 words and the address references representing the tag and index: 22, 26, 22, 16, 3, 16, and 18, show the sequence for accessing the cache. Assume that the cache is initialized as empty. Draw the final cache table.

Given a cache hierarchy with 8 words with a cache access time of 5 ns and a memory access time of 50ns, and the following set of memory accesses representing the tag and index: 22, 28, 31, 22, 16, 13, 31, 8, 5, 13, 8, and 5.

a) If the cache is a direct-mapped cache, show the sequence for accessing the cache and calculate the total access time. Draw the final cache table

b) If the cache is a 2-way set associative cache, show the sequence for accessing the cache and calculate the total access time.

c) Determine which cache has the better performance and by how much.