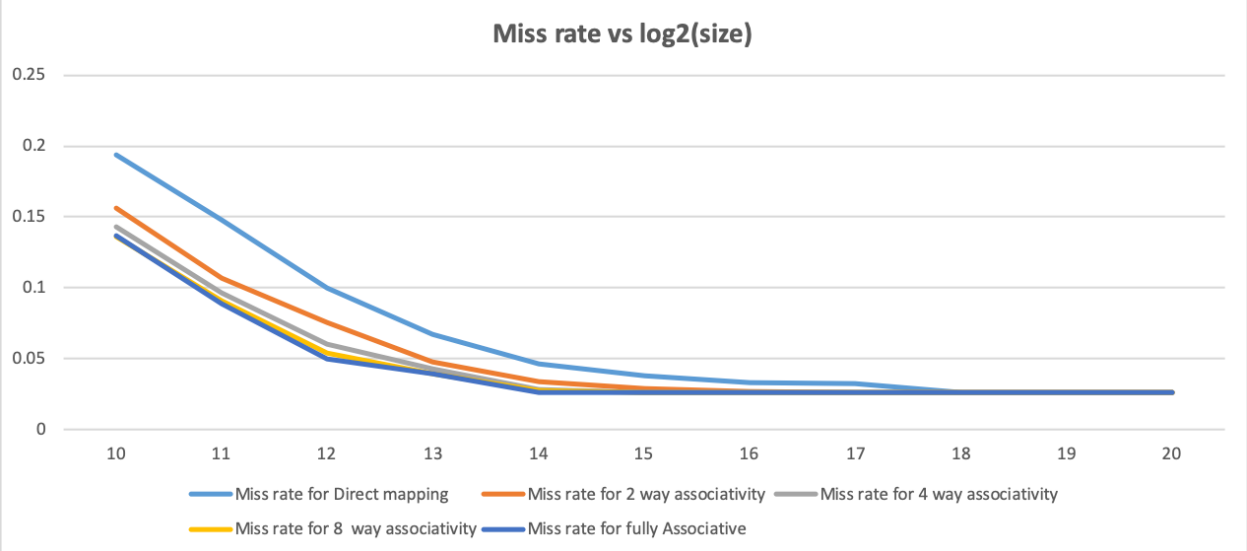
Report

Answer 1:



a) As seen by the graph, we observe that the miss rates go down as the cache size increases. This is because our cache is able to store more data in it and hence lesser misses will occur once the cache is fully being utilized. Further, since size is more, we see lesser number of evictions. Hence more data can be accessed.
Here, we observe that the graphs that have more associativity give lesser miss rates which is true because higher the associativity a greater number of tags can be referenced by one index in a cache. But we also observe that after a while this associativity becomes almost same.

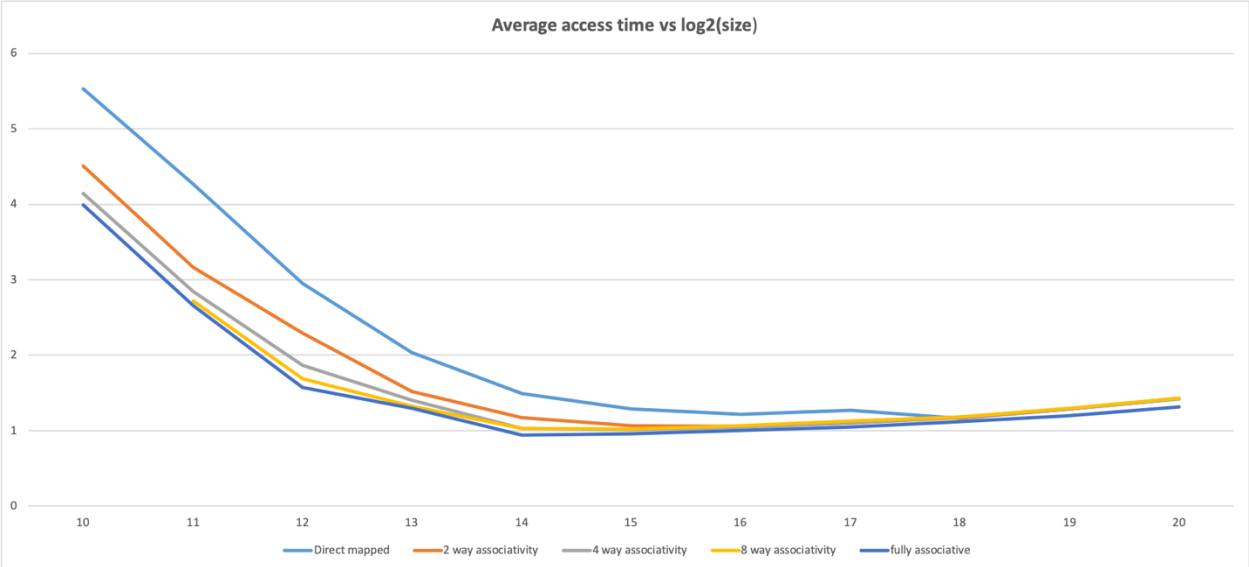
b) A compulsory miss rate is a miss rate that happens when there is a miss due to cold start as there are no values in the cache. To estimate this, I believe the point where all the graph combines together become a line is the point where we can estimate the compulsory misses. So according to the graph we can observe that the blue line is approximately midway between 0.05 and 0 we can safely say that it is 0.025.

c)

Assoc ⇓/ cache size⇒	10	11	12	13	14	15	16	17	18	19	20
Direct mapped	-1.54	-1.61	-1.38	-0.75	-0.55	-0.33	-0.22	-0.21	-0.05	-0.09	-0.11

2 way	-0.52	-0.5	-0.72	-0.23	-0.23	-0.11	-0.061	-0.054	-0.05	-0.09	0
4 way	-0.152	-0.19	-0.29	0.119	-0.084	-0.05	-0.046	-0.06	-0.06	10.003	0
8 way	N/A	-0.062	1.57	0.08	-0.088	-0.065	-0.02	-0.08	-0.062	-0.01	0

Answer 2:



Assuming that the average memory access time is 28 ms.
Only for L1 with block size 32

We observe here that the above graph performs best when it is fully associative and has a size of cache 2^{14} or log(size)=14. This is because any size less than this will give us more cache misses which will result in higher access time. On the other hand, if it will increase in size. More time will be needed to go through the cache.