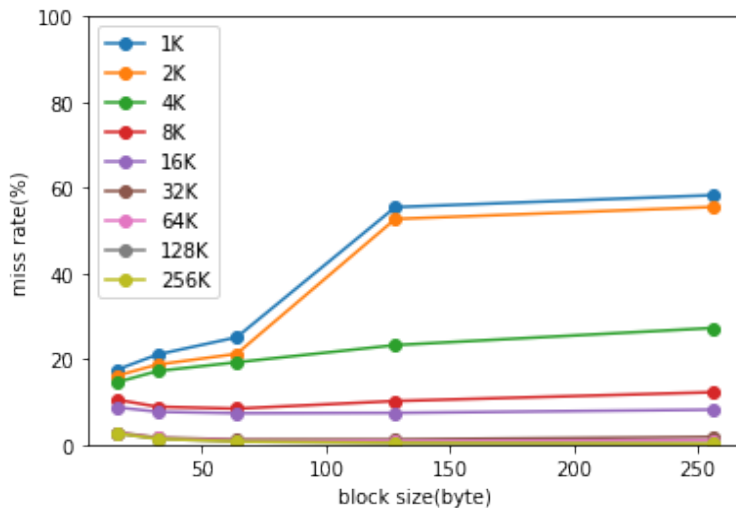


計算機組織 Lab6

0516013 吳泓寬

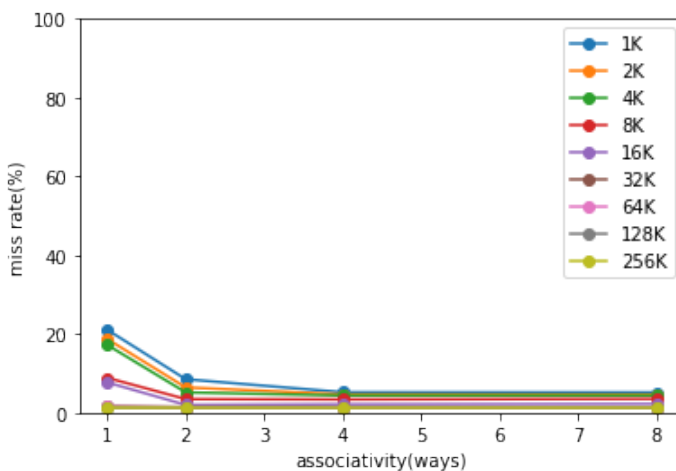
Problem a. direct_map_cache



當cache size越大時，miss rate愈低，因為能選擇的block會變多，比較不會發生collision。

當block size越大時，miss rate起初會降低，因為spatial locality; 但當block size 超過某個大小时，會因為能選擇的block變少，造成pollution發生，導致miss rate上升。

Problem b.



associativity上升，代表index相同的位址，有更多的選擇，因此miss rate下降，而如同上面所說cache size上升，能選擇的block會變多，因此miss rate也會下降。

附錄

兩張圖皆由python matplotlib 所繪製 以下附上繪製的資料
problem a.

[block size] [miss rate]

[16,32,64,128,256],[17.5907,21.0556,25.0864,55.4709,58.2618]

[16,32,64,128,256],[16.1694,18.7126,21.2169,52.7074,55.5098]

[16,32,64,128,256],[14.6371,17.2048,19.2569,23.2604,27.2552]

[16,32,64,128,256],[10.4853,8.87097,8.43174,10.2074,12.2595]
[16,32,64,128,256],[8.72408,7.70161,7.35599,7.42944,8.18692]
[16,32,64,128,256],[2.89315,1.69499,1.23128,1.2572,1.82892]
[16,32,64,128,256],[2.79234,1.55818,1.01094,0.855415,1.05271]
[16,32,64,128,256],[2.63105,1.38825,0.751728,0.420507,0.250576]
[16,32,64,128,256],[2.63105,1.38825,0.751728,0.420507,0.250576]

problem b.

| [associativity] | [miss rate] |
|-----------------|-----------------------------------|
| [1,2,4,8] | [21.0556,8.51526,5.22321,5.18865] |
| [1,2,4,8] | [18.7126,6.43577,4.68606,4.64718] |
| [1,2,4,8] | [17.2048,5.17281,4.38364,4.38796] |
| [1,2,4,8] | [8.87097,3.47062,3.38278,3.54407] |
| [1,2,4,8] | [7.70161,1.99165,2.1227,2.24798] |
| [1,2,4,8] | [1.69499,1.45305,1.40841,1.39257] |
| [1,2,4,8] | [1.55818,1.38969,1.38825,1.38825] |
| [1,2,4,8] | [1.38825,1.38825,1.38825,1.38825] |
| [1,2,4,8] | [1.38825,1.38825,1.38825,1.38825] |