

## Task 3-1

1. Simpleloop, Memory size: 50

Alg	hit rate(%)	hit count	miss count	overall evict	clean evict	dirty evict
rand	70.68	7215	2993	2943	245	2698
fifo	70.98	7246	2962	2912	199	2713
lru	72.77	7248	2780	2730	88	2642
clock	72.63	7414	2794	2744	99	2645

2. Simpleloop, Memory size: 100

Alg	hit rate	hit count	miss count	overall evict	clean evict	dirty evict
rand	72.83	7434	2774	2674	62	2612
fifo	73.00	7452	2756	2656	45	2611
lru	73.71	7525	2683	2583	1	2582
clock	73.66	7519	2689	2589	5	2584

3. Matmul, Memory size: 50

Alg	hit rate	hit count	miss count	overall evict	clean evict	dirty evict
rand	94.88	6490	350	300	140	160
fifo	94.82	6486	354	304	139	165
lru	96.10	6537	267	217	80	137
clock	95.89	6559	281	231	90	141

4. Matmul, Memory size: 100

Alg	hit rate	hit count	miss count	overall evict	clean evict	dirty evict
rand	97.38	6661	179	79	6	73
fifo	97.47	6667	173	73	0	73
lru	97.82	6691	149	49	0	49
clock	97.72	6684	156	56	0	56

## Task 3-2

Algorithm Comparison:

1. The hit rate of fifo is close to that of rand (the difference is  $< 1\%$ ), while lru and clock have slightly higher hit rates. The hit rates of all four algorithms increase and the difference of hit rates among the algorithms decrease while memory increases.

2. The eviction count of fifo is also close to that of rand while lru and clock have smaller eviction counts. More specifically, for lru and clock, the dirty eviction counts decrease by approximately 2% for the simpleloop traces and decrease by approximately 20% for the matmul traces, compared with the dirty counts of rand. While there are significantly decrease in the clean eviction counts of lru and clock, compared with those of rand. The eviction counts of all four algorithms decrease while memory increases.

### Task 3-3

#### 1. Trace 1

Alg	hit rate(%)	hit count	miss count
opt	54.55	18	15
fifo	39.39	13	20
lru	48.48	16	17
clock	48.48	16	17

#### 2. Trace 2

Alg	hit rate(%)	hit count	miss count
opt	48.48	16	17
fifo	39.40	13	20
lru	45.45	15	18
clock	48.48	16	17

#### 3. Trace 3

Alg	hit rate(%)	hit count	miss count
fifo	0	0	36
lru	0	0	36
clock	0	0	36