- CPSC 275: Introduction to Computer Systems

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Fall 2025

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- Solution

Solution to Homework 28

1.

A.

Element	Address	Set index	Element	Address	Set index
x[0]	0	0	y[0]	32	0
x[1]	4	0	y[1]	36	0
x[2]	8	0	y[2]	40	0
x[3]	12	0	y[3]	44	0
x[4]	16	1	y[4]	48	1
x[5]	20	1	y[5]	52	1
x[6]	24	1	y[6]	56	1
x[7]	28	1	y[7]	60	1

B.

Element	Address	Set index	Element	Address	Set index
x[0]	0	0	y[0]	48	1
x[1]	4	0	y[1]	52	1
x[2]	8	0	y[2]	56	1
x[3]	12	0	y[3]	60	1
x[4]	16	1	y[4]	64	0
x[5]	20	1	y[5]	68	0
x[6]	24	1	y[6]	72	0
x[7]	28	1	y[7]	76	0

C. The padding eliminates the conflict misses. Thus, three-fourths of the references are hits.

2. Hit rate = 90% ⇒ miss rate = 10%. Thus, the average memory access time is $0.90 \times 1 + 0.10 \times 50 = 5.9$ ns
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3. System B provides the faster average memory access time.
A: $0.95 \times 1 + 0.05 \times 40 = 2.95$ ns
B: $0.98 \times 2 + 0.02 \times 25 = 2.46$ ns

4. $0.90 \times 1 + 0.10 \times (0.60 \times 5 + 0.40 \times 100) = 5.2$ ns

- **Welcome: Sean**
  - LogOut