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COMS 352

Assignment 7

8.13)

a. External fragmentation

This happens when too much memory is dynamically allocated, and not all of it can be used. If too much fragmentation happens, it reduces the amount of memory

available. Total memory exists to satisfy a request, but it is not contiguous.

b. Internal fragmentation

This is when allocated memory blocks have restriction on allowed sizes, and thus causes space to be wasted, because allocated memory can be larger than requested

memory. The size difference is memory internal to a partition.

c. Ability to share code across processes

This is made possible by sharing pages. If two processes need the same code, they reference the same page.

8.20)

a. 3085

b. 42095

c. 215201

d. 650000

SOLUTION :

Length of offset is 10bits.

a) 3085

step1:

3085 is 0000 1100 0000 1101. In 32 bit addressing is 0000 0000 0000 0000 0000 1100 0000 1101.

Step2:

Page number = 0000000000000000000011

Offset = 0000001101

page number=3 and offset = 13.

b) 42095

step1:

42095 is 1010 0100 0110 1111. In 32 bit addressing is 0000 0000 0000 0000 1010 0100 0110 1111.

Step2:

Page number = 00000000000000001010 01

Offset = 0001101111

page number=41 and offset = 111.

c) 215201

step1: Convert the decimal number into binary.

215201 is 11 0100 1000 1010 0001. In 32 bit addressing is 0000 0000 0000 0011 0100 1000 1010 0001.

Step2:

Page number = 0000000000000011010010

Offset = 0010100001

page number=210 and offset = 161.

d) 650000

step1:

650000 is 1001 1110 1011 0001 0000. In 32 bit addressing is 0000 0000 0000 1001 1110 1011 0001 0000.

Step2:

Page number = 0000000000001001111010

Offset = 1100010000

page number=634 and offset = 784.

8.28)

QUESTION :

(a) 0,430

(b) 1,10

(c) 2,500

(d) 3,400

(e) 4,112

SOLUTION :

(a) 219 + 430 = 649

(b) 2300 + 10 = 2310

(c) illegal reference; traps to operating system

(d) 1327 + 400 = 1727

(e) illegal reference; traps to operating system

8.29)

QUESTION :

"What is the purpose of paging the page tables?"

SOLUTION :

If page tables are extremely large, paging them allows to manage memory by swapping portions of page tables which aren't being used.

9.3)

SOLUTION :

• 9E F - 0E F

• 111 - 211

• 700 - D00

• 0F F - EFF

9.8)

QUESTION Consider Ref String

1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6

SOLUTION :

FRAMES 1 2 3 4 5 6 7

LRU 20 18 15 10 8 7 7

FIFO 20 18 16 14 10 10 7

Optimal 20 15 11 8 7 7 7