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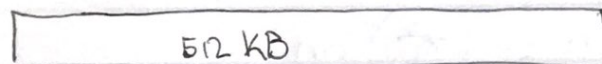
Assignment 4

Task 1:

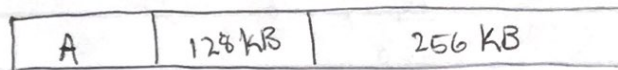
1.1) Clock replacement Algorithm

Task 2:

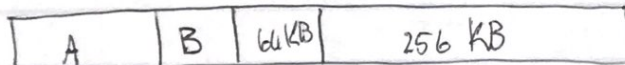
2.1)



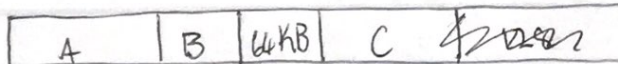
Request A



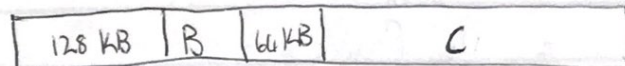
Request B



Request C



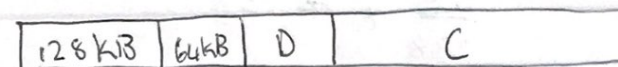
Return A



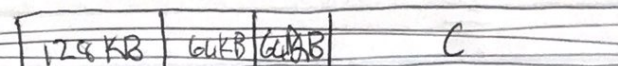
Request D



Return B



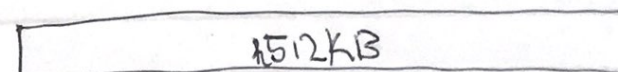
~~Return D~~



Return D



Return C



Task 3:

$$\begin{aligned} \text{3.1) } S &= p_1 + p_2 + p_3 + p_4 & m &= 128 \text{ frames} \\ &= 45 + 75 + 33 + 135 \\ &= 288 \end{aligned}$$

$$\begin{aligned} p_1: \quad a_1 &= \left(\frac{S_1}{S} \right) \times m \\ &= \frac{45}{288} \times 128 \\ &= \underline{\underline{20 \text{ frames}}} \end{aligned}$$

$$\begin{aligned} p_2: \quad a_2 &= \left(\frac{S_2}{S} \right) \times m \\ &= \frac{75}{288} \times 128 \\ &= \underline{\underline{33 \text{ frames}}} \end{aligned}$$

$$\begin{aligned} p_3: \quad a_3 &= \left(\frac{S_3}{S} \right) \times m \\ &= \frac{33}{288} \times 128 \\ &= \underline{\underline{14 \text{ frames}}} \end{aligned}$$

$$\begin{aligned} p_4: \quad a_4 &= \frac{S_4}{S} \times m \\ &= \frac{135}{288} \times 128 \\ &= \underline{\underline{60 \text{ frames}}} \end{aligned}$$

Task 4:

$$\begin{aligned} 4.1) \quad & 2 \text{ KB} \times 8 \text{ entries} \\ & = \underline{\underline{16 \text{ KB}}} \end{aligned}$$

$$4.2) \quad 4 \text{ Segments at } 16 \text{ KB per segment}$$

$$\begin{aligned} \therefore & 4 \times 16 \text{ KB} \\ & = \underline{\underline{64 \text{ KB}}} \end{aligned}$$

$$4.3) \quad 2^{11} = 2048 = 2 \text{ KB}$$

$$\therefore \text{offset} = 11 \text{ bits}$$

$$\begin{aligned} & \text{Page table has } \underline{8 \text{ entries}} \text{ for each segment} \\ \therefore & 0-7 = 3 \text{ bits} \end{aligned}$$

hence, leaves 2 bits for segment number

$$00021ABC \Rightarrow 32 \text{ bits physical address}$$

$$\begin{aligned} \therefore 32 - 11 (\text{offset}) &= 21 \text{ bits for frame number} \\ & (\text{physical address}) \end{aligned}$$

Logical address :

- 2 bits segment number
- 3 bits page number
- 11 bits offset

$$\begin{aligned} \text{Maximum physical address space} &= 2^{32} \\ &= 4 \text{ GB} \end{aligned}$$

Task 5

5.1) $0,228$

$$\therefore 228 + 830 = \underline{1058}$$

5.2) $2,648$ ($648 > 408$)

\therefore segment Fault

5.3) $3,776$

$$\begin{aligned}\therefore 776 + 770 \\ = \underline{1546}\end{aligned}$$

5.4) $1,98$

$$\begin{aligned}\therefore 98 + 648 \\ = \underline{746}\end{aligned}$$

5.5) $1,240$ ($240 > 110$)

\therefore Segment Fault