RAM = 64 kbyte = $2^6 \times 2^{10} = \dfrac{2^{16}}{2^?} = \boxed{2^{13}} \Rightarrow$ $\boxed{0, 1 \cdots\cdots, 2^{13}-1}$

cache = 4 block/line = $\boxed{8 \text{ byte}}$
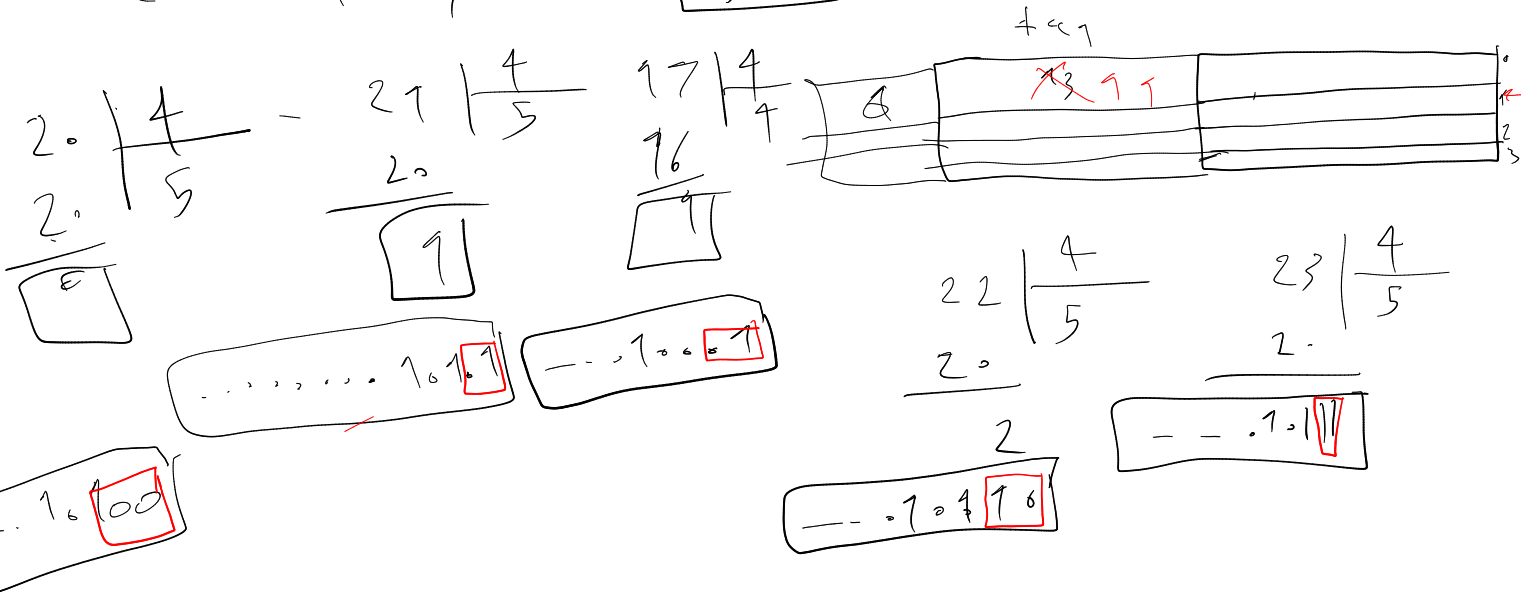
tag

$20 \left|\dfrac{4}{5}\right.$ $-$ $27 \left|\dfrac{4}{5}\right.$ $17 \left|\dfrac{4}{4}\right.$ $\boxed{8}$ $12\,9\,5$

$\dfrac{20}{6}$ $\dfrac{20}{7}$ $\dfrac{16}{9}$

$\cdots\cdots\cdots 1\,0\,1\boxed{1}$ $\cdots\cdots 1\cdots 0\,5\boxed{1}$

$22\left|\dfrac{4}{5}\right.$ $23\left|\dfrac{4}{5}\right.$

$\dfrac{20}{2}$ $\dfrac{20}{ }$

$\cdots\cdots 1\,0\,\boxed{0\,0}$ $\cdots\cdots 1\,0\,1\boxed{1\,0}$ $\cdots\cdots\cdot 1\,0\boxed{1\,1}$

$17 \longrightarrow 1$
$27 \longrightarrow 1$

$1 \longrightarrow 17 \quad \text{mis}$
$2 \longrightarrow 27 \quad \text{mis}$
$3 \longrightarrow 17 \quad \text{miss}$

set → { 0 ←
1 ←
2 ←
3 ←

set1 { 4
5
6
7

set2 { 8 ←
9
10
11

---

set0   0 3520   3
        1 1000   1
        2 4.56   0
        3 4368   2

set2   8 2698   3
        6 3594   1
        1. 4.5.   0
        19 458   2

64 line   8 set → 8 → 8 line

17 → 6

21 → 6   1 → 7 { 8
                    i
                    15

           0 → 0 { 0
                    i
                    7

$$64k = 2^6 \times 2^{10} = 2^{16}$$

$$\#block = \frac{2^{16}}{2^2} = \boxed{2^{14}}$$

$$\Rightarrow \overset{32}{2} \Rightarrow \frac{2^{32}}{2^2} = \boxed{2^{3\#}}$$

$$30 - 14 = \boxed{16} \, tag$$

tag | 32 bit
16

4byte
cpu

32 byte
cache

32 byte
RAM

$$256 \, bit = 32 \, byte$$

$$4kb = 2^2 \times 2^{10} = \frac{2^{12}}{2^8} = 2^7 \Rightarrow \boxed{2^6 = 64} \, \#set$$

$$Log_2^{32} = \boxed{5} \, \boxed{offset}$$

$$\boxed{index = 6}$$

$$32 \Rightarrow \overset{32}{2} = \overset{27}{2} \Rightarrow 27 - \textcircled{6} \cancel{-5} = \cancel{16} \, tag$$

$$\textcircled{5}$$

$$0 \rightarrow \boxed{32 \, byte}$$

$$\boxed{32 - 6 - \textcircled{5} = \boxed{27}}$$

$$32 \rightarrow 2^{27} \rightarrow 27 - 6 = \boxed{21}$$