**Cache simulator using SystemC**

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**Requirements:**

Cache size = 32 KB

Cache line size = 32 Bytes

Cache ways = 8

**Calculations:**

Byte offset bits = log2(Cache line size) = log2(32) = **5 bits**

Index bits = log2(Cache size / (Cache line size \* Cache ways))

= log2(32K / (32 \* 8)) = **7 bits**

Tag bits = Address bits – Index bits – Byte offset bits = 32 – 7 – 5 = **20 bits**

**Results:**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Tracefiles | CPU | Reads | Read Hits | Read Misses | Writes | Write Hits | Write Misses | Hit Rate | Execution time (ns) |
| dbg | 0 | 40 | 19 | 21 | 60 | 29 | 31 | 48.000 | 2259 |
| rnd | 0 | 33031 | 18662 | 14369 | 32505 | 18308 | 14197 | 56.411 | 1534940 |
| fft | 0 | 86298 | 7282 | 79016 | 43195 | 10990 | 32205 | 14.110 | 8074286 |

**Screenshots:**

1. Text

   Description automatically generateddbg\_p1
2. Text

   Description automatically generatedrnd\_p1
3. Text

   Description automatically generatedfft\_p1