

Ex 1:

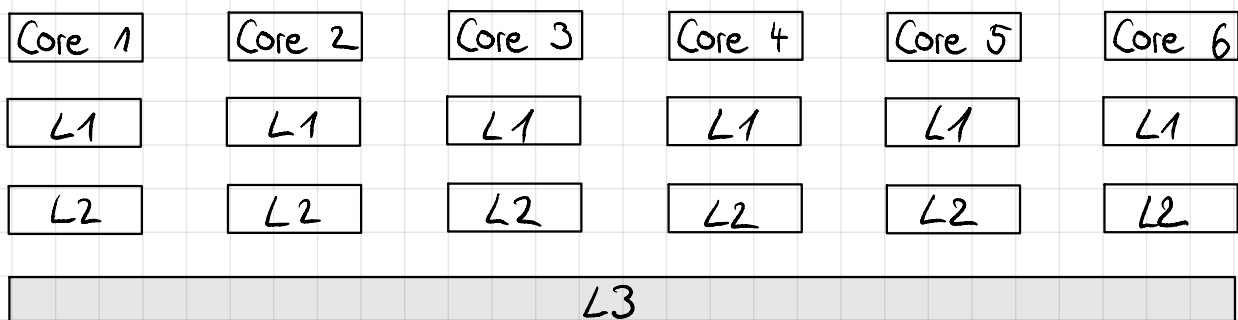
Number of cores: 6

Number of Threads: 12 (2 each)

Size of cache and memory: L1: 32kB

L2: 512kB

L3: 4MB



Ex 2: Incomplete Cholesky:

for $k=1$ to n :

for $j=1$ to $k-1$ and $(k,j) \in NZ(A)$

$$l_{kk} = l_{kk} - l_{kj}^2$$

$$l_{kk} = \sqrt{l_{kk}}$$

for $i=k$ to n : and $(i,k) \in NZ(A)$

for $j=1$ to $k-1$: and $(ij) \in NZ(A)$ and $(k,j) \in NZ(A)$

$$l_{ik} = l_{ik} - l_{ij} \cdot l_{kj}$$

end

$$l_{ik} = l_{ik} / l_{kk}$$

end

for $i > j$:

$$a_{ij} = \sum_{k=1}^j l_{ik} l_{jk}$$

$$\Rightarrow l_{ij} = \frac{1}{l_{jj}} \left(a_{ij} - \sum_{k=1}^{j-1} l_{ik} l_{jk} \right)$$

for $i=j$:

$$a_{ii} = \sum_{k=1}^i l_{ik}^2$$

$$\Rightarrow l_{ii} = \sqrt{a_{ii} - \sum_{k=1}^{i-1} l_{ik}^2}$$

Alg. Iterative Cholesky (i)

Setze l_{ij} auf a_{ij} für $(ij) \in NZ(A)$

for $k=1, 2, 3, \dots$ until convergence

parallel for $(ij) \in NZ(A)$ with $i > j$

if $i > j$:

$$l_{ij} = \frac{1}{l_{jj}} \left(a_{ij} - \sum_{k=1}^{j-1} l_{ik} l_{jk} \right)$$

else:

$$l_{ii} = \sqrt{a_{ii} - \sum_{k=1}^{i-1} l_{ik}^2}$$

end

end

end