

# NOTES: Cache Optimization

notes/cache-optimization.md

# Optimizing Programs for the Cache

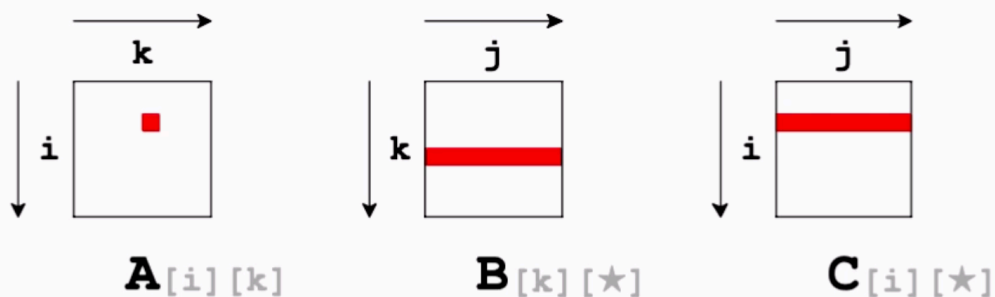
## Traversing Arrays

- When traversing arrays, it's best to traverse the rows as outer loop, columns in inner loop
  - Because of spatial locality, you're more likely to access the same cache line multiple times in a row
- If the entire array fits in the cache, the direction of traversal doesn't matter
- It's better to combine multiple traversal loops into one to improve locality

## Matrix Multiplication

### Matrix Multiplication: $kij$

```
for (k = 0; k < n; k++)  
  for (i = 0; i < n; i++) {  
    a = A[i][k];  
    for (j = 0; j < n; j++)  
      C[i][j] += a * B[k][j];  
  }
```



Miss rate: **0.0** + **0.25** + **0.25** = **0.5**