1. What is a false sharing miss (multicores) and how can you remedy it?

2. What is a true sharing miss (multicores) and how can you remedy it?

3. On x86 cache lines are 64 bytes. You have a 1024 x 1024 matrix \( A[i][j] \) you will iterate over:

   ```python
   for y in range(1024):
       for x in range(1024):
           print(A[x][y])
   ```

   As a compiler writer, can you do anything to prevent re-caching the same data repeatedly in this loop? Note that the iteration order is against the cache lines.

4. What tools can you use to instrument your compiler’s cache performance?
   Use an epic tool called Valgrind in cachegrind mode. Compile a test program and run
   ```bash
   valgrind --tool=cachegrind your_prog
   ```