Performance of basic matmul

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This is a simple LaTeX file to demonstrate how I use the `listings` package to include nicely typeset code in my documents, and how I use `pgfplots` to generate nice-looking plots. In order to compile this document, you will need to have a LaTeX installation with PGF and TikZ installed.

The code is shown in Figure 1, and the performance is shown in Figure 2. The performance is never that high, but it falls off a clif for the dimensions greater than 400. Notice the interesting wiggles in the performance curve due to cache associativity effects.

```
const char* dgemm_desc = "Basic, three-loop dgemm.";

void square_dgemm(const int M,
                  const double *A, const double *B, double *C)
{
    int i, j, k;
    for (i = 0; i < M; ++i) {
        for (j = 0; j < M; ++j) {
            double cij = C[j*M+i];
            for (k = 0; k < M; ++k)
                cij += A[k*M+i] * B[j*M+k];
            C[j*M+i] = cij;
        }
    }
}
```

Figure 1: Naive matrix-matrix multiplication code in C.

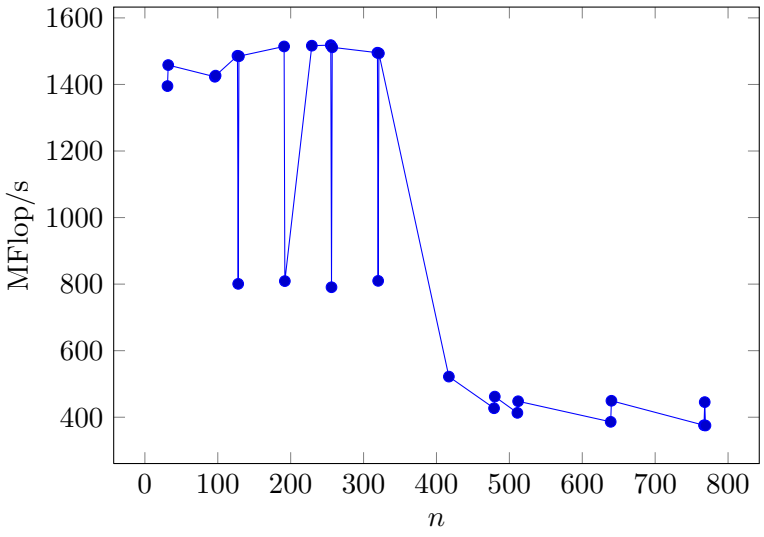

Figure 2: Performance of naive matrix-matrix multiplication code.