Blocking

Name: Mostafa khaled kamal.

ID:20011923.

Code snippet:

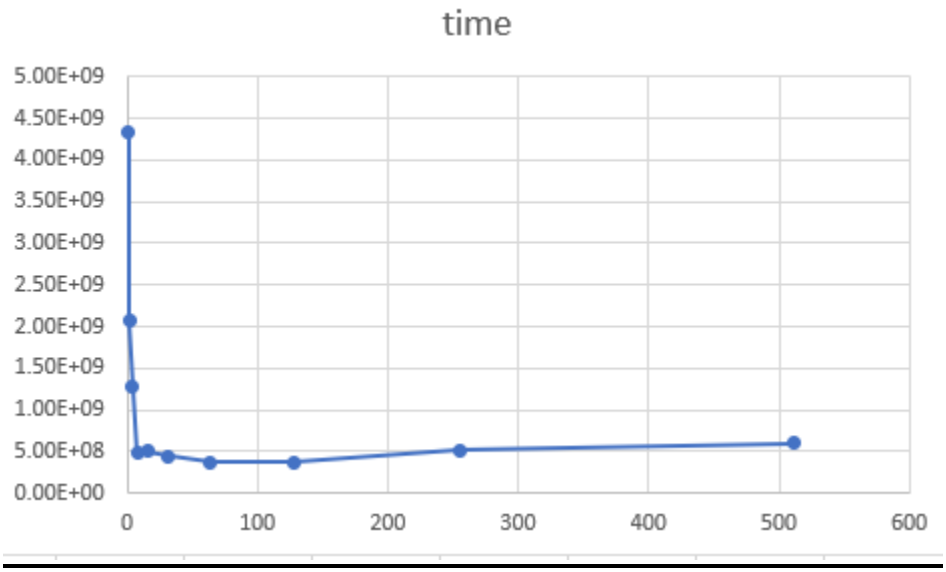
```
public class met {
    public static final int BLOCKSIZE =16;
    public static void do_block(int n, int si, int sj, int sk, double [][]A, double [][]B, double [][]C){
        for(int i = si; i< si+BLOCKSIZE; i++){
            for(int j= sj; j< sj+BLOCKSIZE; j++){
                double cij = C[i][j];
                for(int k = sk; k< sk+BLOCKSIZE; k++){
                    cij += A[i][k]*B[k][j];
                }
                C[i][j]=cij;
            }
        }

    }
    public static void degmm(int n, double [][]A, double [][]B, double [][]C){
        for(int sj = 0; sj < n; sj += BLOCKSIZE){
            for(int si = 0; si < n; si+=BLOCKSIZE){
                for(int sk=0 ; sk < n; sk+=BLOCKSIZE){
                    do_block(n, si, sj, sk, A, B, C);
                }
            }
        }
    }
    public static void main(String[] args) {
        // TODO Auto-generated method stub
         int n=16;
         double[][] A = new double[n][n];
         double[][] B = new double[n][n];
         double[][] C = new double[n][n];
         double t1=System.nanoTime();
         degmm(n,A,B,C);
         double t2=System.nanoTime();
         System.out.println(t2-t1);
    }
```

Graphs && results:

N: size of square matrix ,time is in nano second

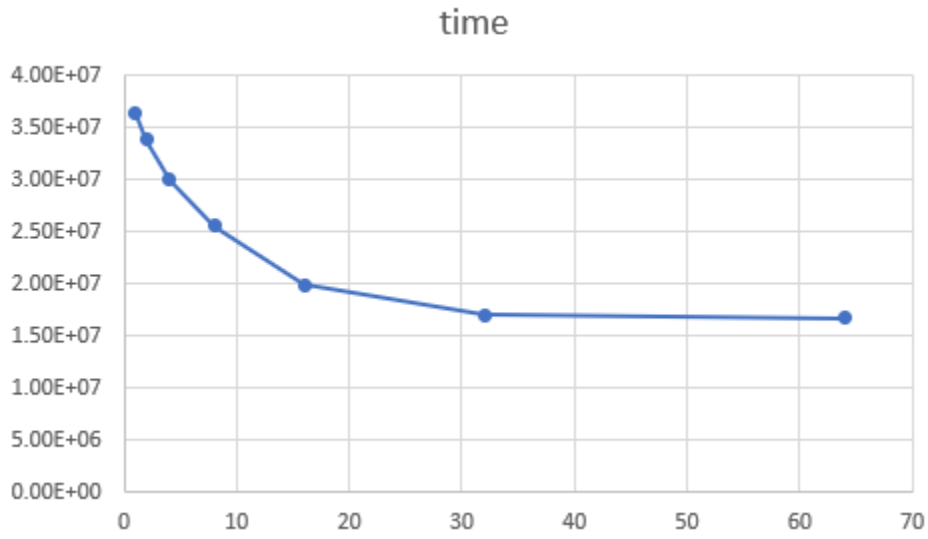
1)N=512.

n=512	
blocksize	time
1	4.34E+09
2	2.08E+09
4	1.27E+09
8	4.75E+08
16	4.96E+08
32	4.38E+08
64	3.73E+08
128	3.67E+08
256	5.11E+08
512	5.94E+08



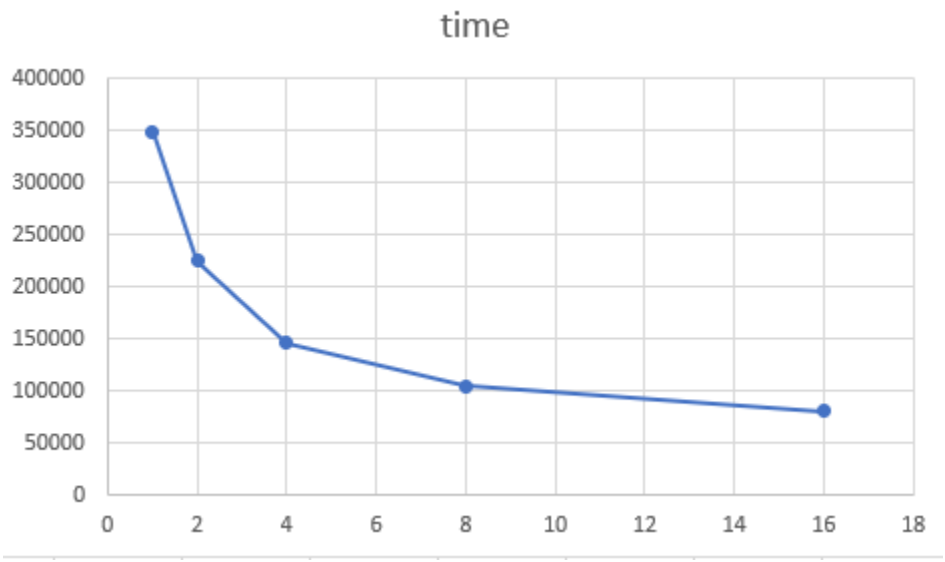
2)N=128.

n=128	
blocksize	time
1	3.64E+07
2	3.38E+07
4	3.00E+07
8	2.56E+07
16	1.99E+07
32	1.70E+07
64	1.68E+07



3)n=16.

n=16	
blocksize	time
1	349000
2	225200
4	146000
8	104300
16	80400



Work explanation.

- As the block size increase the time decreases for a range then the time increases again.