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public class QuickInsertion {
    public static void sort(int[] a, int cutoff) {
        sort(a, cutoff, 0, a.length-1);
    }
    private static void sort(int[] a, int cutoff, int lo, int hi) {
        if (hi <= lo + cutoff) {
            insertionSort(a, lo, hi);
            return;
        }
        int j = partition(a, lo, hi);
        sort(a, cutoff, lo, j-1);
        sort(a, cutoff, j+1, hi);
    }

    private static int partition(int[] a, int lo, int hi) {
        int i = lo, j = hi+1;
        int v = a[lo];
        while (true) {
            while(a[++i] < v == true) if (i == hi) break;
            while(v < a[--j] == true) if (j == lo) break;
            if (i >= j) break;
            exch(a, i, j);
        }
        exch(a, lo, j);
        return j;
    }

    private static void insertionSort(int[] a, int lo, int hi) {
        int N = hi;
        for (int i = lo; i < N+1; i++) {
            for (int j = i; j > 0 && a[j] < a
                [j-1]; j--)
                exch(a, j, j-1);
        }
    }

    private static void exch(int[] a, int i, int j) {
        int tmpStorage = a[i]; a[i] = a[j]; a[j] = tmpStorage;
    }

    public static void main(String[] args) {
        int N = StdIn.readInt();
        int cutoff = StdIn.readInt();
        int j = 0;
        while(j < 5) {
            double[] runTimes = new double[100];
            for(int runThrough = 0; runThrough < 100; runThrough++) {
                int[] a = new int[N];
                for(int i = 0; i<a.length; i++)
                    a[i] = StdRandom.uniform(10*N);
                Stopwatch stopwatch = new Stopwatch();
                sort(a, cutoff);
                runTimes[runThrough] = stopwatch.elapsedTime();
            }
            StdOut.print("Mean: "); StdOut.printf("%.2e", StdStats.mean(runTimes));
            StdOut.println();
            StdOut.print("Dev: "); StdOut.printf("%.2e", StdStats.stddev(runTimes));
        }
    }
}

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StdOut.println();
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N = N*10;
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j++;
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}
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}
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}
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