

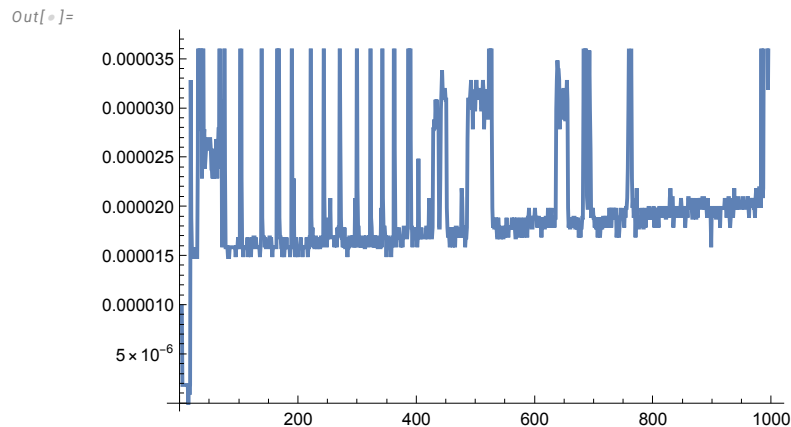

```
In[ ]:= Module[{i, j, a}, a = {};
  For[i = 1, i ≤ 10, i++, For[j = 1, j ≤ 10, j++, a = Join[a, {i, j}]]];
  a]
```

```
Out[ ]:=
{1, 1, 1, 2, 1, 3, 1, 4, 1, 5, 1, 6, 1, 7, 1, 8, 1, 9, 1, 10, 2, 1, 2, 2, 2, 3, 2, 4, 2, 5, 2,
 6, 2, 7, 2, 8, 2, 9, 2, 10, 3, 1, 3, 2, 3, 3, 3, 4, 3, 5, 3, 6, 3, 7, 3, 8, 3, 9, 3, 10,
 4, 1, 4, 2, 4, 3, 4, 4, 4, 5, 4, 6, 4, 7, 4, 8, 4, 9, 4, 10, 5, 1, 5, 2, 5, 3, 5, 4, 5,
 5, 5, 6, 5, 7, 5, 8, 5, 9, 5, 10, 6, 1, 6, 2, 6, 3, 6, 4, 6, 5, 6, 6, 6, 7, 6, 8, 6, 9,
 6, 10, 7, 1, 7, 2, 7, 3, 7, 4, 7, 5, 7, 6, 7, 7, 7, 8, 7, 9, 7, 10, 8, 1, 8, 2, 8, 3,
 8, 4, 8, 5, 8, 6, 8, 7, 8, 8, 8, 9, 8, 10, 9, 1, 9, 2, 9, 3, 9, 4, 9, 5, 9, 6, 9, 7, 9,
 8, 9, 9, 9, 10, 10, 1, 10, 2, 10, 3, 10, 4, 10, 5, 10, 6, 10, 7, 10, 8, 10, 9, 10, 10}
```

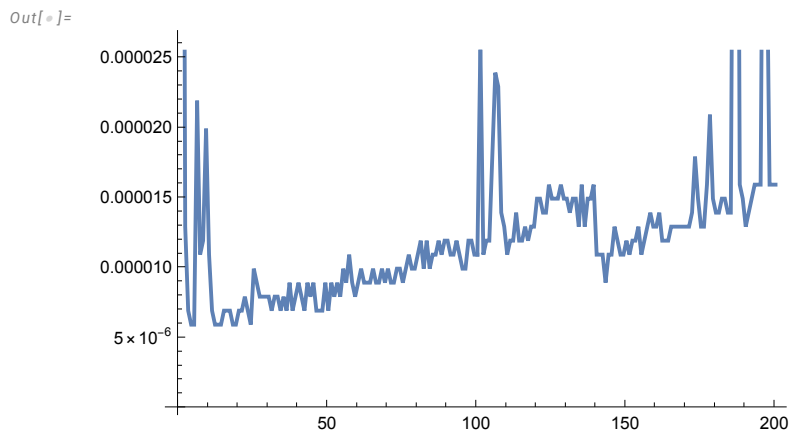
```
In[ ]:= Flatten[Table[Join[{i}, {j}], {i, 1, 10}, {j, 1, 10}]]
```

```
Out[ ]:=
{1, 1, 1, 2, 1, 3, 1, 4, 1, 5, 1, 6, 1, 7, 1, 8, 1, 9, 1, 10, 2, 1, 2, 2, 2, 3, 2, 4, 2, 5, 2,
 6, 2, 7, 2, 8, 2, 9, 2, 10, 3, 1, 3, 2, 3, 3, 3, 4, 3, 5, 3, 6, 3, 7, 3, 8, 3, 9, 3, 10,
 4, 1, 4, 2, 4, 3, 4, 4, 4, 5, 4, 6, 4, 7, 4, 8, 4, 9, 4, 10, 5, 1, 5, 2, 5, 3, 5, 4, 5,
 5, 5, 6, 5, 7, 5, 8, 5, 9, 5, 10, 6, 1, 6, 2, 6, 3, 6, 4, 6, 5, 6, 6, 6, 7, 6, 8, 6, 9,
 6, 10, 7, 1, 7, 2, 7, 3, 7, 4, 7, 5, 7, 6, 7, 7, 7, 8, 7, 9, 7, 10, 8, 1, 8, 2, 8, 3,
 8, 4, 8, 5, 8, 6, 8, 7, 8, 8, 8, 9, 8, 10, 9, 1, 9, 2, 9, 3, 9, 4, 9, 5, 9, 6, 9, 7, 9,
 8, 9, 9, 9, 10, 10, 1, 10, 2, 10, 3, 10, 4, 10, 5, 10, 6, 10, 7, 10, 8, 10, 9, 10, 10}
```

```
In[ ]:= ListLinePlot[Table[First[Timing[n^n]], {n, 1, 1000}]]
```



```
In[ ]:= ListLinePlot[Table[First[Timing[Sort[RandomSample[Range[n]]]]], {n, 1, 200}]]
```



Section 48

```
In[ ]:= LetterCounts[ToUpperCase[
  StringJoin[If[StringLength[#] > 1, StringTake[#, 2], #] & /@ WordList[]]]]
```

Out[]=

```
<| E → 7527, A → 7525, O → 6388, I → 5648, R → 5309, S → 4907, U → 4441, C → 4365, N → 4268,
   P → 3950, L → 2958, H → 2904, T → 2865, D → 2741, M → 2716, B → 2457, F → 1840,
   G → 1319, W → 1187, V → 972, Y → 579, X → 458, K → 330, J → 321, Q → 306, Z → 64 |>
```

```
In[ ]:= Reap[Fold[10 Sow[#1] + #2 &, {1, 2, 3, 4, 5}]]
```

Out[]=

```
{12 345, {{1, 12, 123, 1234}}}
```

```
In[ ]:= Reap[Nest[If[EvenQ[#], Sow[#/2], 3 # + 1] &, 1000, 20]]
```

Out[]=

```
{274, {{500, 250, 125, 188, 94, 47, 71, 107, 161, 242, 121, 182, 91}}}
```