

## CoCoA-5 - Slug #230

### More curiously slow code -- squaring a polynomial

21 Sep 2012 14:22 - John Abbott

<b>Status:</b>	New	<b>Start date:</b>	21 Sep 2012
<b>Priority:</b>	Normal	<b>Due date:</b>	
<b>Assignee:</b>		<b>% Done:</b>	0%
<b>Category:</b>		<b>Estimated time:</b>	0.00 hour
<b>Target version:</b>	CoCoA-5.?.?	<b>Spent time:</b>	0.00 hour
<b>Description</b>			
<p>The function SquaredPoly should be of quadratic complexity, so doubling the degree should increase computation by about a factor of 4. Instead the time increases by a rather larger factor. Here is some sample code:</p>			
<pre>Define SquaredPoly(V)   L := Len(V);   If Len(V) = 0 Then Return V; EndIf;   N := 0;   For I := L To 1 Step -1 Do If V[I] &lt;&gt; 0 Then N := I; Break; EndIf; EndFor;   If N = 0 Then Return [0]; EndIf;   N := N-1;   Q := NewList(2*N+1, 0);   For I := 0 To N-1     Do For J := I+1 To N       Do Q[I+J+1] := Q[I+J+1] + V[I+1]*V[J+1];     EndFor;   EndFor;   For I := 1 To 2*N+1 Do Q[I] := 2*Q[I]; EndFor;   For I := 0 To N Do Q[2*I+1] := Q[2*I+1] + V[I+1]^2; EndFor;   Return Q; EndDefine;</pre>			
<pre>Define L2F(L)   TopLevel x;   Return Sum([L[I]*x^(I-1)   I In 1..Len(L)]); EndDefine; -- L2F</pre>			
<pre>Define RndPoly(D)   TopLevel CurrentRing;    Return [Rand(-99,99)*one(CurrentRing)   I In 0..D]; EndDefine; -- RndPoly</pre>			
<pre>Use ZZ/(29641)[x]; PolyDeg := 500; NumberOfTests := 3; PolyList := [RndPoly(PolyDeg*2^I)   I In 0..NumberOfTests-1];  For I := 1 To NumberOfTests Do   t0 := CpuTime();   S := SquaredPoly(PolyList[I]);   delta_t := DecimalStr(CpuTime()-t0);   PrintLn "SquaredPoly, polinomio ", I, ": ", delta_t;   F := L2F(PolyList[I]);   t0 := CpuTime();   S := F^2;   delta_t := DecimalStr(CpuTime()-t0);   PrintLn "Quadrato CoCoA, polinomio ", I, ": ", delta_t; EndFor;</pre>			

## History

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**#1 - 02 Apr 2014 17:34 - Anna Maria Bigatti**

- Target version set to CoCoA-5.1.0 Easter14

**#2 - 04 Apr 2014 15:10 - John Abbott**

- Target version changed from CoCoA-5.1.0 Easter14 to CoCoA-5.??