APS and Tools

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APS Introduction

- **APS** is the system of algebraic programming that has been developed in the mid-eighties in departments Nos. 100,105 of the Institute of Cybernetics of the National Academy of Sciences of Ukraine.
- **APS** is the first system which has started to use separately the technology of rewriting of terms and strategy.
- The reason of its **week distribution** were:

1. Unstable situation in Ukraine in 1990
2. Memory leaks.
3. Sluggishness of interpreter of APS

Goal: we will try to prove, that APS together with developed by us tools at present time is one of most powerful tools for development of scientific as well as commercial applications.

Compare the Capacity of Rewriting

№	System names	Fibonacci number (in seconds)					
		15	20	21	22	23	24
1	Interpreter of ELAN	0	2	6	11.5	18.5	28
2	Interpreter of Stratego	0	3	7	12	21	34
3	Interpreter of MAUDE	0.004	0.04	0.068	0.072	0.104	0.236
4	Procedures of APS	0	0	1	3	4	8
5	Rewriting systems of APS	0	2	2	4	6	10

Tools Introduction

- The tools of APS include:

1. The Language APLANC (**A**lgebraic **P**rogramming **Lan**guage C ++):

a. Function input_aplan.

b. Functions make_formula, make_hash_formula.

c. Function let.

d. Canonizators and functions

e. Functions applr, appls, nbt, ntb

2. The converter from APLAN language to APLANC language.

Converter APLAN to APLANC

- The requirements to the APS converter:

1. The source code of the system should depend only on FPL.
2. The source code of the system should use the language APLANC.
3. All necessary canonizators of marks should be described by the user.
4. Converter should generate the source code in such a way, in order not to put the changes by the user, but in order the user could put the separate parts of this code into the existing program.

- At present time in order to finish the final version of converter prototype it is lack filling of different APLAN language operators. As to the difficulties, this work is simple, as the major part of procedural possibilities of APS is ready.
- The slowest part of APS is the rewriting interpreter of APLAN language(rewriting optimization or rewriting conversions to a procedures?). Speed of performance of procedures written on APLANC in 10 times exceeds speed of application of systems of rewriting rules.

Experiment With Tools

- So, in the process of transference from program prototype to its final version it is possible:

1. to build the source code manually, i.e. without the use of APS tools.;
2. to use APLANC language without the converter.
3. to use the converter.

№	Algorithm’s name	Lines of the code (psc)	Manual construction (man/hour)	APLANC without the converter (man/hour)	APS tools (man/hour)
1	DNF+CNF	60	3	1.5	0.5
2	REMOVE+ INSERT	160	16	8	2

Thanks,

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