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Breakdown of MIPLIB 2010: Contents & Summary (my opinion&questions in blue color)

1. Introduction
   They describes what they have done via MIPLIB 2010: provided instances, categories of instances (easy, hard, open), progress in solving MIP instances, speedup of commercial MIP solvers, how much it becomes faster to solve MIPs, breakdown of the instances

2. The test sets (361 in total)
   MIPLIB 2003 contains only 60 instances⇒Inadequate test sets for researchers. The authors identified "several areas" for which dedicated test sets should be made available:

   - Benchmark (87): instances solvable to opt. within $\leq$2 hours on high-end PC
   - Infeasible (20): infeasible instances (are these useful?).
   - Primal (40): instances for which the solution of the root LP relaxation has the same objective value as the optimal solution (why the name "primal"?).
   - XXL (11): very large instances w.r.t. #variables, #constraints, #non-zeros.
   - Reoptimize (66): instances for which the reoptimization of the sub-LPs takes an unusually long time.
   - Tree (52): instances that lead to large enumeration trees (how they find/measure it? solvers provide information?)
   - Unstable (21): instances that have "bad"(?) numerical properties and are likely to cause numerical troubles (?) in the solver. This set is intended to test solver robustness.
   - Challenge (164): compliation of hard-to-solve instances, instances that to our knowledge have not been solved to optimality. For 21 instances, no feasible solution has been found. Some of these may be infeasible.

   (a) What are the sources of the instances?
   They started a call for instances: March 2010-Oct. 2010. 1,108 instances from 57 contributors. They translated them to .MPS format. When somebody sent .AMPL model, they preserved them on MIPLIB website. And any other internet repositories: BCOL, CORL, DEIS-ORGLI, etc. Initially, the number of candidate set contained about 2,000 instances. (I think, we also need to make a call for instances to researchers. Prior to that, we need to make a "format" in which they can submit instances. The format can roughly contain: the form of SIP model, application type - energy, manufacturing, logistics, telecom, etc, #scenarios, prob. for each scenario, etc. We will provide a sample format for each family of instances so that they can refer.)

   (b) How were the instances selected?

   - Exclusion of trivial instances and (near) duplicates.
   - Examination and pre-selection by eight groups.
   - Final refinement of the benchmark set.

3. The solution checker

   (a) Floating-point arithmetic and tolerances

   (b) What do MIP solvers actually try to solve?

   (c) What does the solution checker test?

4. How to run a test, add a solver, and what the scripts do?
5. Variability of MIP solver performances
   (a) Reasons for performance variability
   (b) Generating and measureing performance variability
   (c) Results on performance variability
   (d) Consequences for benchmarking
6. The instance catalog
7. State-of-the-art MIP solving
8. Final remarks

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Meaning of files

- MPS : a file format for presenting and archiving LP and MIP
- SMPS : a file format for Stochastic LP and QP
- .jl : A file written in julia syntax. It contains
- .sh
- .cor
- .sto
- .tim