

Modelling

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MODAL
Mathematical Optimization and Data Analysis Laboratories

Implement the (dis)aggregated model for the equitable coach problem in SCIP.

Use the prepared SCIP code:
[/home/exercise/modelling/EquitableCoach](#)

```
1  /** player data structure */
2  struct SubPlayer
3  {
4      char* name;           /**< name of the player */
5      SCIP_VAR** varlist;  /**< list of variables associated with player */
6      SCIP_HASHMAP* varmap; /**< hashmap of variables associated with player */
7      int nvars;           /**< number of variables associated with player */
8      SUB_POSITION* positions; /**< list of positions */
9      int npositions;     /**< number positions */
10 };
```

```
1  /** create player */
2  extern
3  SCIP_RETCODE SCIPplayerCreate(
4      SCIP*                scip,          /**< SCIP data structure */
5      SUB_PLAYER**        player,       /**< player data structure */
6      char*               name          /**< name of the player */
7  );
8
9  /** add a position to the player */
10 extern
11 void SCIPplayerAddPosition(
12     SUB_PLAYER*          player,       /**< player data structure */
13     SUB_POSITION         position     /**< position to add */
14 );
15
16 /** return number of position of the player */
17 extern
18 int SCIPplayerGetNPositions(
19     SUB_PLAYER*          player       /**< player data structure */
20 );
```

```
1  /** problem data */
2  struct SCIP_ProbData
3  {
4      int* gametimes;           /**< number of games */
5      SUB_PLAYER** playerlist; /**< list of players */
6      ...
7      int maxteamsize;        /**< maximal team size */
8      int teamsize;          /**< size of the team */
9      int ngames;            /**< number of games */
10     int nsubstitutions;     /**< max number of substitution periods
11     ...
12 };
```

```
1  /* create the model */
2  static
3  SCIP_RETCODE createModel(
4      SCIP*                scip,    /**< SCIP data structure */
5      SCIP_PROBDATA*      probdata /**< problem data */
6  )
7  {
8      SCIP_Real objoffset;
9      int i;
10     int p; /* iterator over all players */
11     ...
12     assert(scip != NULL);
13     assert(probdata != NULL);
14
15     SCIP_CALL( SCIPallocBlockMemoryArray(scip,
16         &probdata->varsepsplus, probdata->maxteamsize) );
17
18     /* TODO
19      * allocate block memory of size probdata->maxteamsize for
20      * all variables \epsilon^{-}
21      */
22     ...
23 };
```

- ▶ Go to the SCIP linked into the `lib` directory and compile it, e.g.,
`make OPT=dbg LPS=spx`

- ▶ Go into the `<some path>/EquitableCoach` and compile it with the same options

- ▶ You can execute the code with
`bin/scip -f instances/instance_data.sub`

```
<135> bin/scip -f instances/instance_data.sub
SCIP version 3.2.0.1 [precision: 8 byte] [memory: block] [mode: debug] [LP solver: SoPlex 2.2.0] [GitHash: 918517d-dirty]
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External codes:
  Readline 6.3           GNU library for command line editing (gnu.org/s/readline)
  SoPlex 2.2.0          Linear Programming Solver developed at Zuse Institute Berlin (soplex.zib.de) [GitHash: 48da2a2]
  cppad-20140000.3      Algorithmic Differentiation of C++ algorithms developed by B. Bell (www.coin-or.org/CppAD)
  ZLIB 1.2.8            General purpose compression library by J. Gailly and M. Adler (zlib.net)
  GMP 5.1.3            GNU Multiple Precision Arithmetic Library developed by T. Granlund (gmplib.org)
  ZIMPL 3.2.0          Zuse Institute Mathematical Programming Language developed by T. Koch (zimpl.zib.de)

user parameter file <scip.set> not found - using default parameters

read problem <instances/instance_data.sub>
=====
Input data:
Number of Games : 1
Gametime       : [ 20 ]
Substitutions  : 6
Fieldplayers   : 7 [max. 1 keeper, 2 defender, 3 midfielder, 1 striker]
Team Size (max): 12 (12)
  Team : Name      Kee  Def  Mid  Str
        Josh      x    x
        Simon     x
        Jordy     x
        Chris     x  x
        Andy      x
        Richie    x  x
        Tritto    x
        Guy       x
        Neil      x
        Justin    x
        Steve     x
        Cory      x

Segmentation fault
```


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