```
/*********************************************
 * OPL 12.8.0.0 Model
 * Author: asus
 * Creation Date: 1 Apr 2019 at 5:25:43 pm
 *********************************************/

range  Pharmacist = 1..10;
range  Weekday = 1..122;
range  Job = 1..24;

//Decision Variables

dvar boolean   y[Pharmacist][Weekday][Job];

dvar boolean   C1_Leave[Weekday];
dvar boolean   C1_Late[Weekday];
dvar boolean   C1_Lieu[Weekday];
dvar boolean   C1_Long[Weekday];
dvar boolean   C1_Prof[Weekday];
dvar boolean   C1_Rost[Weekday];



dvar boolean   C2_Leave[Weekday];
dvar boolean   C2_Late[Weekday];
dvar boolean   C2_Lieu[Weekday];
dvar boolean   C2_Long[Weekday];
dvar boolean   C2_Prof[Weekday];
dvar boolean   C2_Rost[Weekday];

dvar boolean   C3_Leave[Weekday];
dvar boolean   C3_Late[Weekday];
dvar boolean   C3_Lieu[Weekday];
dvar boolean   C3_Long[Weekday];
dvar boolean   C3_Prof[Weekday];
dvar boolean   C3_Rost[Weekday];

dvar boolean   C4_Leave[Weekday];
dvar boolean   C4_Late[Weekday];
dvar boolean   C4_Lieu[Weekday];
dvar boolean   C4_Long[Weekday];
dvar boolean   C4_Prof[Weekday];
dvar boolean   C4_Rost[Weekday];


dvar boolean   C5_Leave[Weekday];
dvar boolean   C5_Late[Weekday];
dvar boolean   C5_Lieu[Weekday];
dvar boolean   C5_Long[Weekday];
dvar boolean   C5_Prof[Weekday];
dvar boolean   C5_Rost[Weekday];

dvar boolean   C6_Leave[Weekday];
dvar boolean   C6_Late[Weekday];
dvar boolean   C6_Lieu[Weekday];
dvar boolean   C6_Long[Weekday];
dvar boolean   C6_Prof[Weekday];
```

```
dvar boolean   C6_Rost[Weekday];

dvar boolean   C7_Leave[Weekday];
dvar boolean   C7_Late[Weekday];
dvar boolean   C7_Lieu[Weekday];
dvar boolean   C7_Long[Weekday];
dvar boolean   C7_Prof[Weekday];
dvar boolean   C7_Rost[Weekday];

dvar boolean   C10_Leave[Weekday];
dvar boolean   C10_Late[Weekday];
dvar boolean   C10_Lieu[Weekday];
dvar boolean   C10_Long[Weekday];
dvar boolean   C10_Prof[Weekday];
dvar boolean   C10_Rost[Weekday];

//Objective Function

dexpr int   z = sum(i in Pharmacist, j in Weekday, k in Job) y[i][j][k];

maximize z;

//Constraints

subject to{

//Every full-time staff memeber (EFT = 1) requires 1 ADO per calender month

forall(i in 3..9)
   sum(j in 1..21) y[i][j][19] ==1;

forall(i in 3..9)
   sum(j in 22..41) y[i][j][19] ==1;

forall(i in 3..9)
   sum(j in 42..61) y[i][j][19] ==1;

forall(i in 3..9)
   sum(j in 62..80) y[i][j][19] ==1;

forall(i in 3..9)
   sum(j in 81..103) y[i][j][19] ==1;

forall(i in 3..9)
   sum(j in 104..122) y[i][j][19] ==1;


//Physical Limitation Constraint

forall(i in Pharmacist, j in Weekday)
  sum(k in 1..24) y[i][j][k] <= 1;

//Job Completion Constraint

forall(j in Weekday, k in 1..8)
  sum(i in Pharmacist) y[i][j][k] == 1;
```

```
115
116 //Late Shift/Leave/Time in Lieu/etc
117
118
119 ///for i = 1 (Two part-timers);
120
121 sum(j in 3..4) C1_Leave[j] ==2;
122
123 C1_Leave[28] ==1;
124
125 C1_Leave[35] ==1;
126
127 C1_Leave[71] ==1;
128
129 sum(j in 86..87) C1_Leave[j] ==2;
130
131 C1_Leave[90] ==1;
132
133 ////Total Days Off:
134
135 sum(j in Weekday) C1_Leave[j]  == 8;
136
137
138 ///for i = 2 (Two part-timers);
139
140 sum(j in 1..2) C2_Leave[j] ==2;
141
142
143 sum(j in 23..24) C2_Leave[j] ==2;
144
145
146 C2_Rost[26] == 1;
147
148
149 sum(j in 28..29) C2_Long[j] ==2;
150
151
152 C2_Long[32] == 1;
153
154
155 C2_Leave[39] == 1;
156
157
158 sum(j in 42..44) C2_Leave[j] == 3;
159
160
161 C2_Leave[47] == 1;
162
163
164 ////Total Days Off:
165
166 sum(j in Weekday) C2_Leave[j] == 9;
167 sum(j in Weekday) C2_Long[j] == 3;
168 sum(j in Weekday) C2_Rost[j]  == 1;
169
170 ////////////Total =13;
171
```

```
172
173 ///for i = 3;
174
175 sum(j in 15..17) C3_Late[j] == 3;
176
177
178 C3_Late[22] == 1;
179
180
181 sum(j in 99..108) C3_Leave[j] == 10;
182
183
184 ////Total Days Off:
185
186 sum(j in Weekday) C3_Leave[j] == 10;
187 sum(j in Weekday) C3_Late[j] == 4;
188
189 ////////////Total =14;
190
191
192 ///for i = 4;
193
194 sum(j in 67..71) C4_Late[j] == 5;
195
196
197 ////Total Days Off:
198
199 sum(j in Weekday) C4_Late[j] == 5;
200
201
202 ///for i = 5;
203
204 sum(j in 84..88) C5_Late[j] == 5;
205
206
207 ////Total Days Off:
208
209 sum(j in Weekday) C5_Late[j] == 5;
210
211
212 ///for i = 6;
213
214 sum(j in 52..64) C6_Leave[j] == 13;
215
216
217 sum(j in 72..75) C6_Late[j] == 4;
218
219
220 ////Total Days Off:
221
222 sum(j in Weekday) C6_Late[j] == 4;
223 sum(j in Weekday) C6_Leave[j] == 13;
224
225 ////////////Total =17;
226
227
228 ///for i = 7;
```

```
229
230 sum(j in 4..8) C7_Late[j] == 5;
231
232
233 ////Total Days Off:
234
235 sum(j in Weekday) C7_Late[j] == 5;
236
237
238 ///for i = 8;
239
240 sum(j in 9..13) y[8][j][20] == 5;
241
242 sum(j in 31..32) y[8][j][21] ==2;
243
244
245 ///for i = 10;
246
247 C10_Leave[13] ==1;
248
249
250 C10_Long[113] ==1;
251
252
253 C10_Long[117] ==1;
254
255
256 C10_Long[118] ==1;
257
258
259 C10_Long[122] ==1;
260
261
262 ////Total Days Off:
263
264 sum(j in Weekday) C10_Leave[j] == 1;
265 sum(j in Weekday) C10_Long[j] == 4;
266
267
268 ////////////Total = 5
269
270
271 //Individual Rotation Constraint
272
273 ///for i = 1 (Two part-timers);
274
275 forall(j in Weekday)
276   y[1][j][1] <= 1 - C1_Leave[j];
277
278 forall(j in Weekday)
279   y[1][j][1] >= 1 - C1_Leave[j];
280
281 forall(j in Weekday)
282   y[1][j][18] <= C1_Leave[j];
283
284 forall(j in Weekday)
285   y[1][j][18] >= C1_Leave[j];
```

```
286
287 ///for i = 2 (Two part-timers);
288
289 forall(j in Weekday)
290   y[2][j][2] <= 1 - C2_Leave[j];
291
292 forall(j in Weekday)
293   y[2][j][2] >= 1 - C2_Leave[j];
294
295 forall(j in Weekday)
296   y[2][j][18] <= C2_Leave[j];
297
298 forall(j in Weekday)
299   y[2][j][18] >= C2_Leave[j];
300
301
302 forall(j in Weekday)
303   y[2][j][2] <= 1 - C2_Long[j];
304
305 forall(j in Weekday)
306   y[2][j][2] >= 1 - C2_Long[j];
307
308 forall(j in Weekday)
309   y[2][j][22] <= C2_Long[j];
310
311 forall(j in Weekday)
312   y[2][j][22] >= C2_Long[j];
313
314
315 forall(j in Weekday)
316   y[2][j][2] <= 1 - C2_Rost[j];
317
318 forall(j in Weekday)
319   y[2][j][2] >= 1 - C2_Rost[j];
320
321 forall(j in Weekday)
322   y[2][j][24] <= C2_Rost[j];
323
324 forall(j in Weekday)
325   y[2][j][24] >= C2_Rost[j];
326
327 ///for i = 3;
328
329 forall(j in Weekday)
330   y[3][j][3] <= 1 - C3_Leave[j];
331
332 forall(j in Weekday)
333   y[3][j][3] >= 1 - C3_Leave[j];
334
335 forall(j in Weekday)
336   y[3][j][18] <= C3_Leave[j];
337
338 forall(j in Weekday)
339   y[3][j][18] >= C3_Leave[j];
340
341
342 forall(j in Weekday)
```

```
  y[3][j][3] <= 1 - C3_Late[j];

forall(j in Weekday)
  y[3][j][3] >= 1 - C3_Late[j];

forall(j in Weekday)
  y[3][j][20] <= C3_Late[j];

forall(j in Weekday)
  y[3][j][20] >= C3_Late[j];

///for i = 4;

forall(j in Weekday)
  y[4][j][4] <= 1 - C4_Late[j];

forall(j in Weekday)
  y[4][j][4] >= 1 - C4_Late[j];

forall(j in Weekday)
  y[4][j][20] <= C4_Late[j];

forall(j in Weekday)
  y[4][j][20] >= C4_Late[j];

///for i = 5;

forall(j in Weekday)
  y[5][j][5] <= 1 - C5_Late[j];

forall(j in Weekday)
  y[5][j][5] >= 1 - C5_Late[j];

forall(j in Weekday)
  y[5][j][20] <= C5_Late[j];

forall(j in Weekday)
  y[5][j][20] >= C5_Late[j];


///for i = 6;

forall(j in Weekday)
  y[6][j][6] <= 1 - C6_Late[j];

forall(j in Weekday)
  y[6][j][6] >= 1 - C6_Late[j];

forall(j in Weekday)
  y[6][j][20] <= C6_Late[j];

forall(j in Weekday)
  y[6][j][20] >= C6_Late[j];


forall(j in Weekday)
  y[6][j][6] <= 1 - C6_Leave[j];
```

```
400
401 forall(j in Weekday)
402   y[6][j][6] >= 1 - C6_Leave[j];
403
404 forall(j in Weekday)
405   y[6][j][18] <= C6_Leave[j];
406
407 forall(j in Weekday)
408   y[6][j][18] >= C6_Leave[j];
409
410
411 ///for i = 7;
412
413 forall(j in Weekday)
414   y[7][j][7] <= 1 - C7_Late[j];
415
416 forall(j in Weekday)
417   y[7][j][7] >= 1 - C7_Late[j];
418
419 forall(j in Weekday)
420   y[7][j][20] <= C7_Late[j];
421
422 forall(j in Weekday)
423   y[7][j][20] >= C7_Late[j];
424
425 ///for i = 10;
426
427 forall(j in Weekday)
428   y[10][j][8] <= 1 - C10_Long[j];
429
430 forall(j in Weekday)
431   y[10][j][8] >= 1 - C10_Long[j];
432
433 forall(j in Weekday)
434   y[10][j][22] <= C10_Long[j];
435
436 forall(j in Weekday)
437   y[10][j][22] >= C10_Long[j];
438
439
440 forall(j in Weekday)
441   y[10][j][8] <= 1 - C10_Leave[j];
442
443 forall(j in Weekday)
444   y[10][j][8] >= 1 - C10_Leave[j];
445
446 forall(j in Weekday)
447   y[10][j][18] <= C10_Leave[j];
448
449 forall(j in Weekday)
450   y[10][j][18] >= C10_Leave[j];
451
452 }
```