//i: indice du vol

//j: indice de l'équipage

//k: indice de l'appareil

//t: indice du temp

SheetConnection my\_sheet("ING.xlsx");

int i=from SheetRead(my\_sheet, "'ING1'!O1:O1");

int j=from SheetRead(my\_sheet, "'ING1'!O2:O2");

int k=from SheetRead(my\_sheet, "'ING1'!R1:R1");

int t=from SheetRead(my\_sheet, "'ING1'!R2:R2");

range maxi=1..i;

range maxj=1..j;

range maxk=1..k;

range maxt=1..t;

//paramater

//HDDP:heure de depart (planifié) du vol i (depart)

//HDAP:heure d'arrivée (planifié) du vol i (depart)

//HADP:heure de départ (planifié) du vol i (arrivée)

//HAAP:heure d'arrivée (planifié) du vol i (arrivée)

//HDDR:heure de départ (réel) du vol i (depart)

//HDAR:heure d'arrivée (réel) du vol i (depart)

//HADR:heure de départ (réel) du vol i (arrivée)

//HAAR:heure d'arrivée (réel) du vol i (arrivée)

//HDT: heure de début du travaille de l'équipage j

//HFT: heure de fin de travaille de l'équipage j

//C: la capacité maximal de l'avion K

//UB: limite d'heure de vol de l'avion k

//PD: nombre de passagers (départ)

//PA:nombre de passagers (arrivé)

float HDDP[maxi][maxt]=from SheetRead(my\_sheet, "'ING1'!O4:U13");

float HDAP[maxi][maxt]=from SheetRead(my\_sheet, "'ING1'!O16:U25");

float HADP[maxi][maxt]=from SheetRead(my\_sheet, "'ING1'!O28:U37");

float HAAP[maxi][maxt]=from SheetRead(my\_sheet, "'ING1'!O40:U49");

float HDT[maxj][maxt]=from SheetRead(my\_sheet, "'ING1'!O79:U87");

float HFT[maxj][maxt]=from SheetRead(my\_sheet, "'ING1'!O91:U99");

float y[maxj][maxt]=from SheetRead(my\_sheet, "'ING1'!O68:U76");

float UB[maxk]=from SheetRead(my\_sheet, "'ING1'!O52:Y52");

int q [maxk][maxt]=from SheetRead(my\_sheet, "'ING1'!O55:U65");//la disponibilité de l'appareil

//variables

dvar float HDDR[maxi][maxt];

dvar float HDAR[maxi][maxt];

dvar float HADR[maxi][maxt];

dvar float HAAR[maxi][maxt];

dvar boolean x [maxi][maxj][maxk][maxt];//afféctation

// objective

minimize sum(i in maxi) sum(j in maxj)sum(k in maxk)sum(t in maxt) (((HDAR[i][t]-HDDR[i][t])-(HDAP[i][t]-HDDP[i][t]))+((HAAR[i][t]-HADR[i][t])-(HAAP[i][t]-HADP[i][t])))\*(x[i][j][k][t]);

// contraintes;

subject to {

forall(i in maxi)

cr1:

HDDP[i][t]<=HDDR[i][t]<=HDDP[i][t]+30;

forall(i in maxi)

cr2:

HAAP[i][t]<=HAAR[i][t]<=HAAP[i][t]+30;

forall(i in maxi)

cr3:

HDAR[i][t]==HDDR[i][t]+(HDAP[i][t]-HDDP[i][t]);

forall(i in maxi)

cr4:

HADR[i][t]==HAAR[i][t]-(HAAP[i][t]-HADP[i][t]);

forall(j in maxj,k in maxk,t in maxt)

cr5:

sum(i in maxi)(((HDAR[i][t]-HDDR[i][t])+(HAAR[i][t]-HADR[i][t]))\*x[i][j][k][t])<=((HFT[j][t]-HDT[j][t])\*y[j][t]);

forall(j in maxj,k in maxk,t in maxt)

cr6:

sum(i in maxi)(((HDAR[i][t]-HDDR[i][t])+(HAAR[i][t]-HADR[i][t]))\*x[i][j][k][t])<=14;

forall(j in maxj, k in maxk, t in maxt)

cr7:

max(i in maxi)(((HDAR[i][t]-HDDR[i][t])+(HAAR[i][t]-HADR[i][t]))\*x[i][j][k][t])<=UB[k];

forall(j in maxj,t in maxt)

cr8:

sum(i in maxi)sum(k in maxk)(x[i][j][k][t])<=(y[j][t]);

forall(i in maxi,t in maxt)

cr9:

sum(j in maxj)sum( k in maxk)(x[i][j][k][t])==1;

forall(i in maxi ,j in maxj,k in maxk,t in maxt)

cr10:

(HDDR[i][t]\*x[i][j][k][t])>=(HDT[j][t]);

forall(i in maxi,j in maxj,t in maxt)

cr11:

(HAAR[i][t]\*x[i][j][k][t])<=(HFT[j][t]);

}

i=9;

j=9;

k=11;

t=7;

HDDP=[7,8,9,9,9,13,14,14,15];

HDAP=[9,10,10,11,15,15,17,17,16];

HADP=[10,11,11,12,16,16,18,18,17];

HAAP=[12,14,13,13,17,21,21,18,19];

HDT=[

[7,8,10,17,18,4,5]

[5,8,10,14,15,1,3]

[1,2,7,5,10,11,15]

[4,6,8,10,15,16,5]

[2,5,3,7,8,10,12]

[4,8,10,7,9,3,5]

[1,7,9,4,2,5,15]

[9,10,16,13,12,8,1]

[8,4,3,2,10,15,12]

];

HFT=[

[13,14,16,23,24,10,11]

[11,14,16,20,21,7,9]

[7,8,12,11,16,17,21]

[10,12,14,16,21,22,11]

[8,11,9,13,15,16,18]

[10,14,16,13,15,9,11]

[7,13,15,10,8,11,21]

[15,16,22,19,18,14,7]

[14,10,9,8,16,21,18]

];

UB=[10,5,8,6,7,7,6,5,10,9,8];

q=[

[1,1,1,0,0,1,1]

[1,1,1,1,1,1,1]

[1,0,0,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,0,0,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,0,0,1,1]

[1,1,1,1,1,1,1]

[1,1,0,0,0,1,1]

];

y=[

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

[1,1,1,1,1,1,1]

];