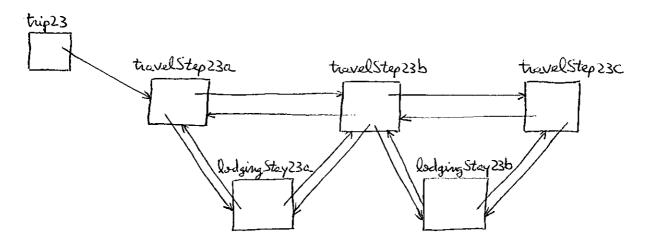
## Frames - an example for planning a trip

We stort with a general sketch of the basic structure of a trip.



There are two main frames: Trip and TravelStep. A Trip will have a sequence of TravelSteps. A TravelStep usually terminates with a Lodging Stay, except when there are two travel steps in a single day or when we reach the last step of the trip.

Lodging Stey slots > arriving Travel Step > departing Travel Step Travel Step origin Lodging Stay > destination Lodging Stay

The generic frame Trip and on instance of it may look as following:

(Trip
<: First Step TravelStep>
<: Traveler Person>
<: Begin Date Date>
<: End Date Date>
<: Total Cost Price>

(trip23
<:INSTANCE-OF Trip>
<:FirstStep travelStep23a>
<:Traveler davidF>
<:BeginDate 23/41/19>
<:EndDate 25/11/19>
<:TotalCost 3400 RON>

```
The frames Travel Step and Lodging Stay share some properties
that we group in the more general frame Trip Port:
        (Trip Port
             < : Begin Dote Date >
             < : End bote Date >
             < : Cost Price>
             < : Payment Method Form Of Payment >
        (Lodging Stay
            < : 15-A TripPart>
            < Place City>
            < : Lodging Place Lodging Place >
            <: Arriving Travel Step Travel Step>
            <: Deporting Travel Step Travel Step>
        (Travel Step
           <: is-A TripPort>
           < : Origin City>
           < : Destination City>
           < : Origin Lodging Stay Lodging Stay >
          < : Destination Lodging Stay Lodging Stay >
          < : Means Form of Transportation>
          < : Departure Time
          <: Arrivol Time >
          Z: Next Step Travel Step >
          <: Previous Step Travel Step >
 Default fillers:
       (Trip Part
       < : Payment Method visa Cord>
      (TravelStep
          <: Means airplane>
          < : Payment Method master Card >
```

```
Notations: - if I is on individual frame and y is a slot, then
            xy refers to the filler of the slot in that frome:
           - SELF is a reference to the current frame.
The filler of the slot : Origin from Travel Step can be calculated
as following:
   (TravelStep
       <: Origin [IF-NEEDED
                      fif no SELF: PreviousStep then otopeni;
                            else SELF: Previous Step: Destination;
                   」> -···)
  (Trip
    < : Total Cost [IF-NEEDED
                     of result < 0
                      X = SELF: First Step;
                        if exists x: Next Step then
                             { result = result + x: (ost;
                              if exists x: Destination Lodging Stay then
                                 { result < result + x : bestinetienlodging Stay: Cost,
                              x = x : Next step;
                        else return result + x: Cost;
                  コラ....)
 (Travel Step
                [IF-ADDED
   < : Next Step
                  I if SELF: End Date & SELF: Next Step: Begin Date then
                      { SELF : Destination Lodging Stay =
                        SELF: Next Step: Origin Lodging Stay =
                          new Lodging Stay
                            with: Begin Date = SELF: End Date;
                           with: End Date = SELF: Next Step: Begin Date;
                            with: Arriving Travel Step = SELF;
                           with: Deporting Travel Step = SELF: Next Step;
```

]>---)

```
(Lodging Stay
       < : Place [IF-NEED ED
                     | SELF : Arriving Travel Step : Destination &
For a certain trip, called trip23, we create an individual
frame
        (trip 23
            L: INSTANCE - OF Trip>
           Z: First Step traisel Step 23 a>
and two instances of Travel Step
      (travel Step 23a
          C: INSTANCE-OF Travel Step>
          <: Destination dortmund>
          <= Begin Date 23/11/19>
          L: End Date 23/11/18>
      (travelStep 23b
         <: INSTANCE - OF TravelStep>
         < : Destination otopeni >
         < : Begin Dite 25/11/19>
         2: End Date 25/11/19>
         < : Previous Step travelStop 230>
trip23
                                                      travelStep 23b
:FinstStep
          travelStep23a
                                        : Begin Dite 25/11/19
 : Begin Date 23/11/19
                                                  25/11/19
                                        : End Dote
: End Date 23/11/19
                                        : Means
: Means
                                        - Origin
; Origin
                                        : Destination otopeni
: Destination doctmend
                                        : Next Step
: Next Step
                                        : Previous Step travel Step 23a
: Previous Step
                                         ; Cost
__C≥<del>-st</del>
                                         : Origin Lodging Stay
: OriginLodging Stay
                                        : Destination Lodging Story
 : Destination Lodging Stay
```

```
To complete the initial setup, we should have travel Step 23a : Next Step = travel Step 23b (Travel Step
```

Z: Previous Step [IF-ADDED

{SELF: Previous Step: Next Step ← SELF;}

As a consequence of this assignment, the IF-ADDED etteched procedure to the slot: Next Step is executed:

(ladging Stay 23 a

C: INSTANCE - OF Lodging Stay >

<= Begin Dete 23/11/19>

<: End Date 25/11/197

<= Anniving Travel Step travel Step 232>

<: Departing Travel Step travel Step 23b>

trip23 :First SteptzellsteT travelStep 23b travelStep23a : Begin Note 25/11/19 : Begin Date 23/11/19 : End Date 25/11/19 : End Date 23/11/19 : Means ainplane - inheritance : Means airplane-inheritance : Origin doctmend IF-NEEDED : Origin otopeni IF-NEEDED : Destination otopeni · Destination dortmund : Next Step travel Step 236 | iF-ADDED : Pravious Step : Next Step : Previous Step travel Step 23a : Previous Step , (pgl : (ost : Origin Lodging Stay : Original odging Stay - Destination Lodging Stay : Destination Lodging Stay-: Arriving Travel Step travel Step 23a : Departing Travel Step 236 : Begin Date 23/11/13 IF-ADDED : End Date 25/11/19 : Next Step : Place dortmend IF-NEEDED : Cost lodging Stay 23a

