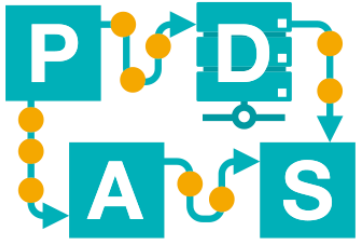
Performance Analysis

Bianka Bakullari

BPI-I11



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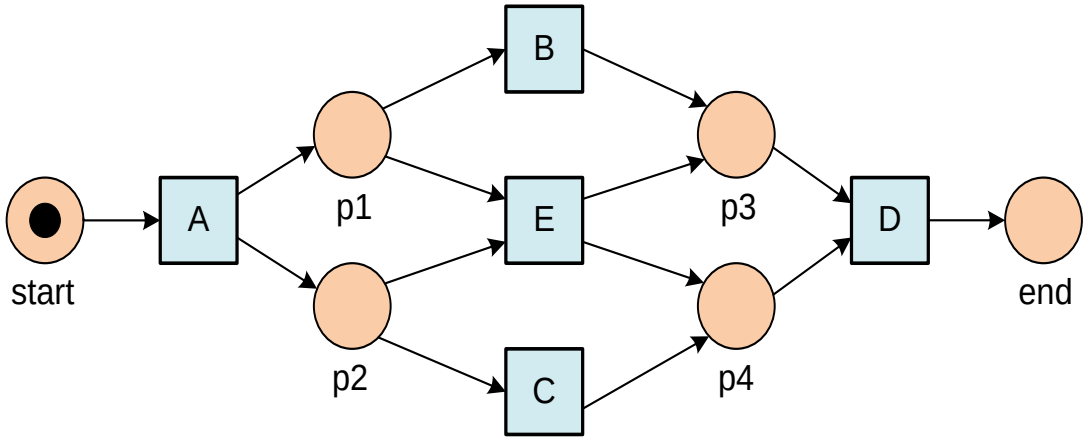
Exercise 1 (Service times)

a) Given is the following process model discovered from the given event log. What are the service times per case?

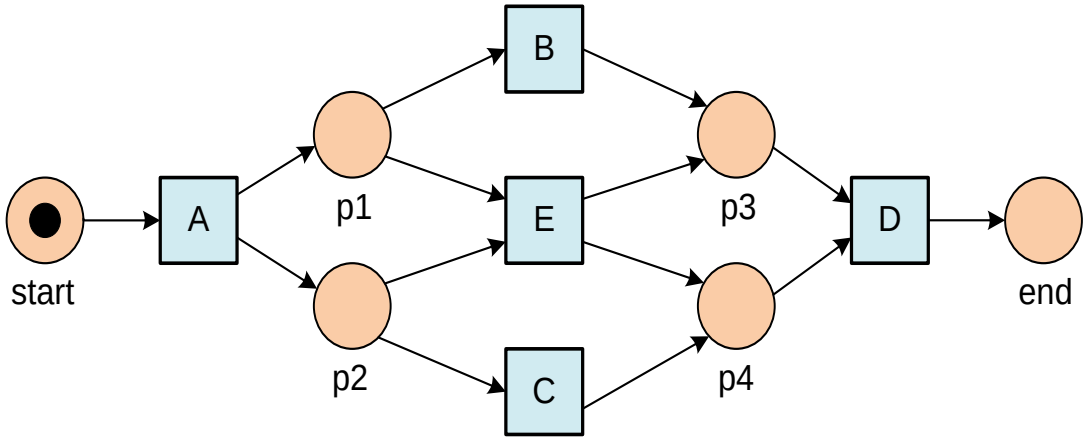


Case ID	Activity	Lifecycle	Resource	Time
1	A	start	Sue	8
1	A	complete	Sue	11
1	B	start	Carol	14
1	B	complete	Carol	21
1	C	start	Rene	22
1	C	complete	Rene	24
1	D	start	Sue	27
1	D	complete	Sue	30
2	A	start	Sue	43
2	A	complete	Sue	47
2	C	start	Rene	52
2	C	complete	Rene	61
2	B	start	Carol	62
2	B	complete	Carol	66
2	D	start	Sue	68
2	D	complete	Sue	71
3	A	start	Nik	83
3	A	complete	Nik	87
3	E	start	Nik	95
3	E	complete	Nik	125
3	D	start	Rene	128
3	D	complete	Rene	130

Service time: start, complete, duration (per activity, per case)

Exercise 1 (Service times)

b) What is the average duration of each activity in the given event log?



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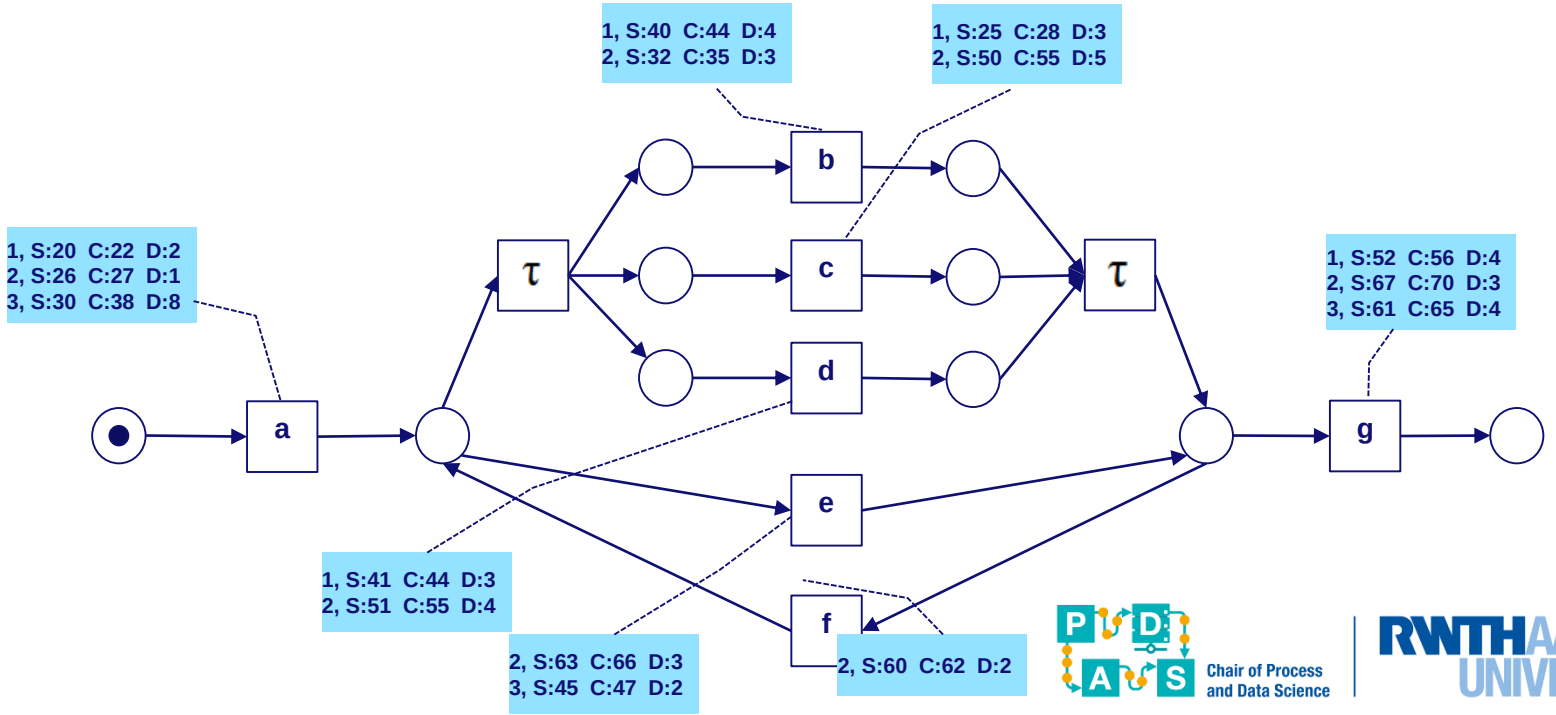
Exercise 2 (Waiting times)

a) Given is the following process model and the service times. For each place and case (1, 2, and 3), compute the waiting time.



S: Start
C: Complete
D: Duration

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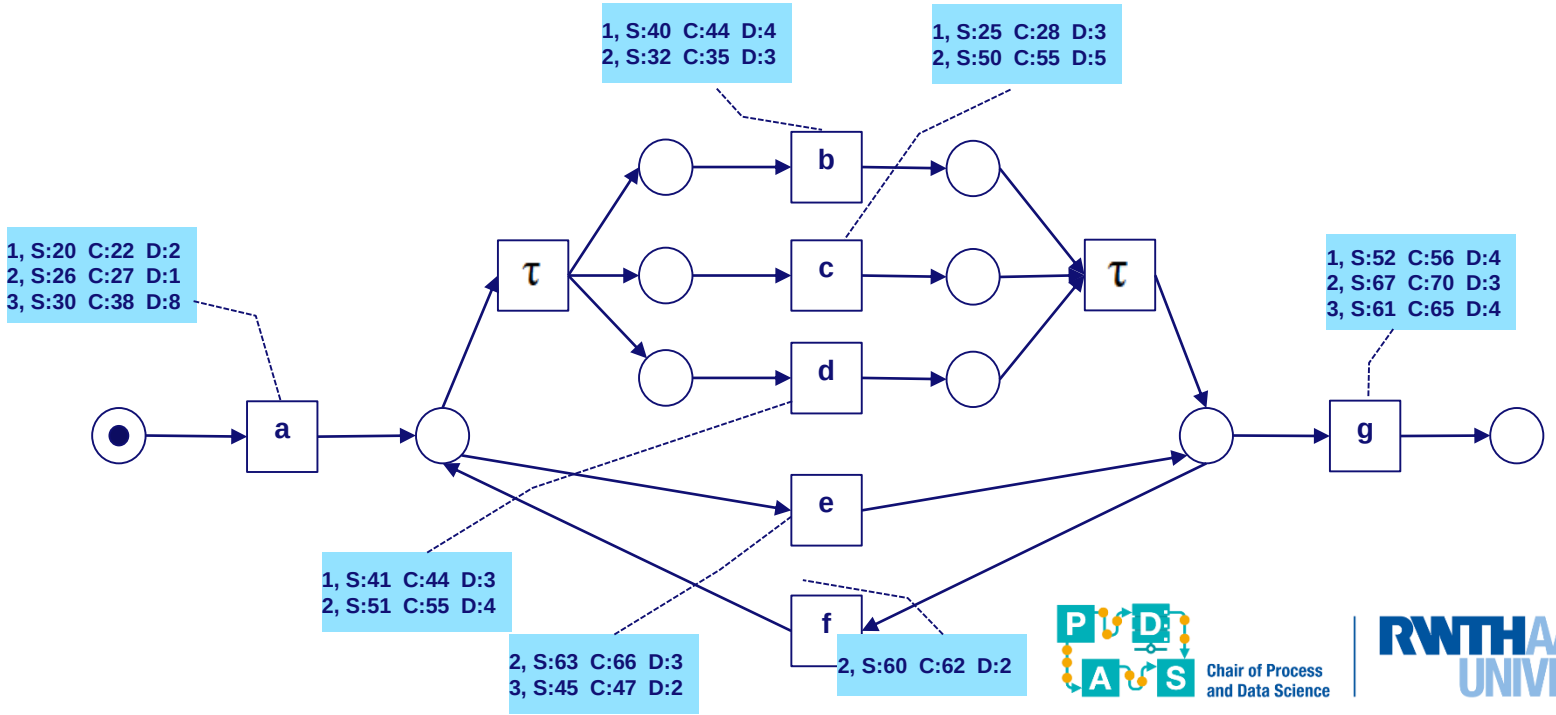
Exercise 2 (Waiting times)

b) What is the average waiting time for each place?



S: Start
C: Complete
D: Duration

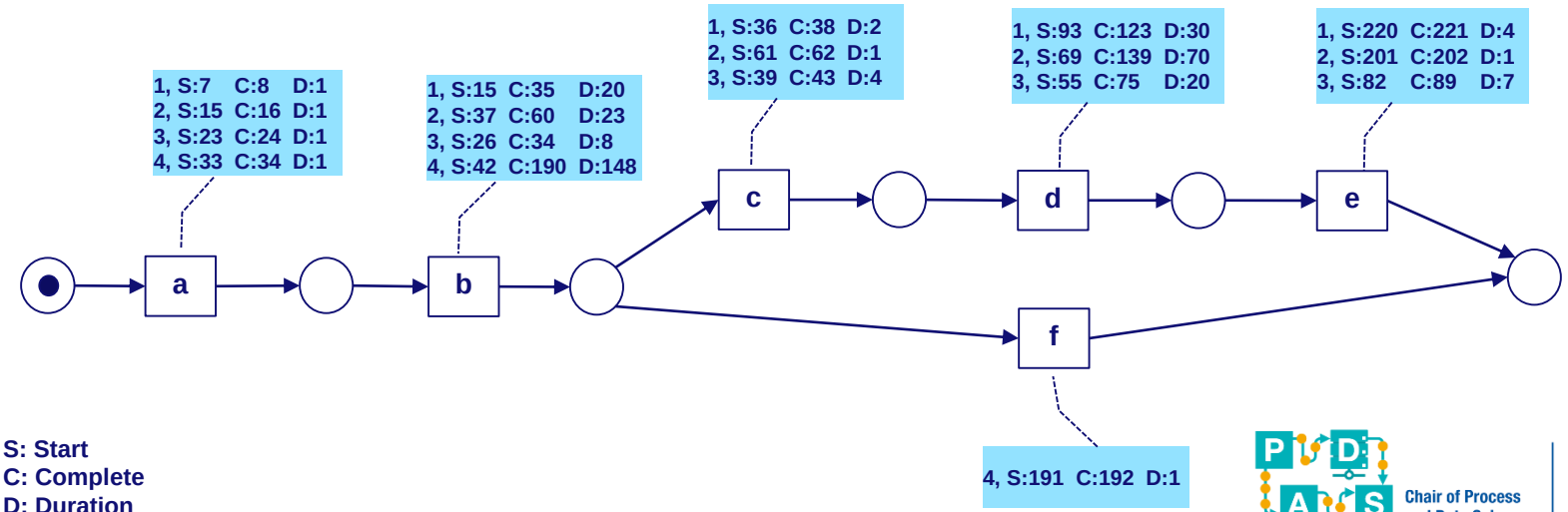
Exercise 3 (Performance)

Given the following process model and the service times:

a) Calculate the average waiting times.

b) Where is a possible bottleneck?

c) What is the average case duration?



S: Start
C: Complete
D: Duration

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Performance analysis with Celonis
Data Integration (same as always)

- Upload the files “activity_table.csv” and “case_table.csv” into Celonis. Create a corresponding data model using the CASE ID to connect the activity table (“activity_table.csv”) and the case table (“case_table.csv”).
- Make sure you assign the case table as the “Case Table” of your “Activity Table”.
- Optional: Set aliases (e.g. “cases” for the case table and “events” for the activity table).
- Don’t forget to load the data model before you start your Analysis.
- Create a new analysis using the newly created data model.

PQL documentation: https://docs.celonis.com/en/pql-function-library.html

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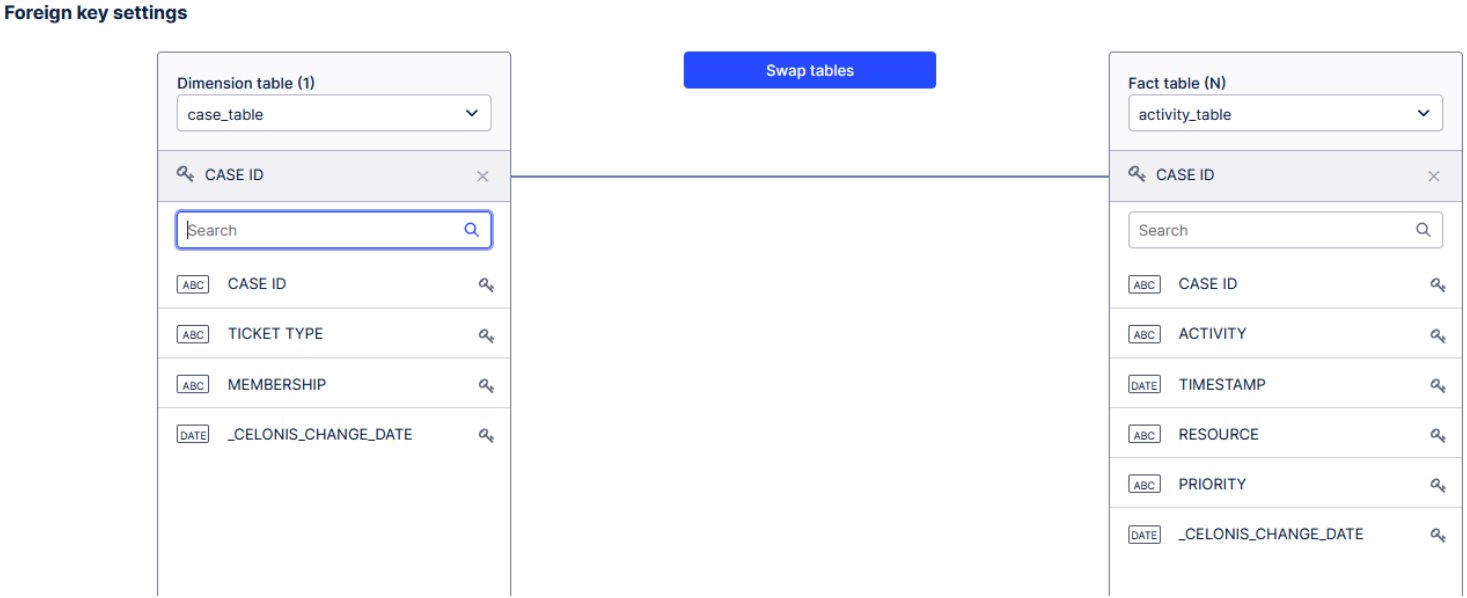

Remember that the activity table is the table on the N side of the relationship (1 case may have multiple events, each event belongs to one unique case).

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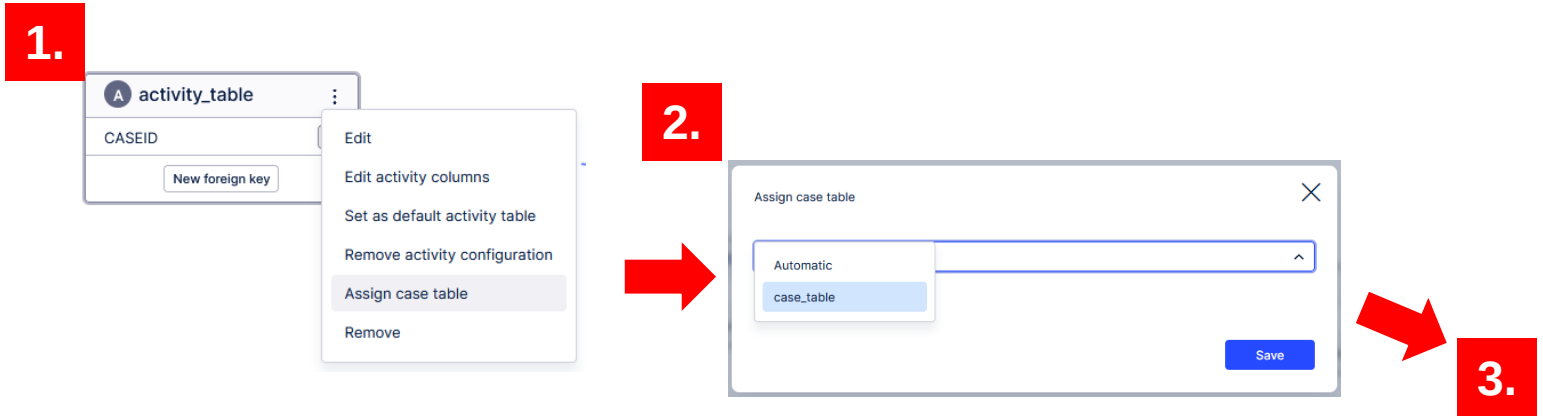
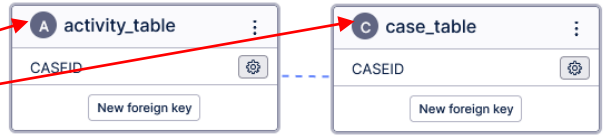


The icons A and C show that the tables have been identified correctly (necessary if you want to use predefined PQL queries.)



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Performance analysis with Celonis

Data Integration (same as always)

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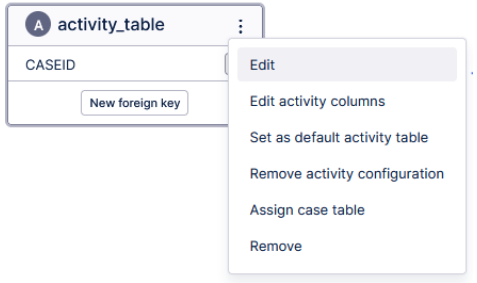
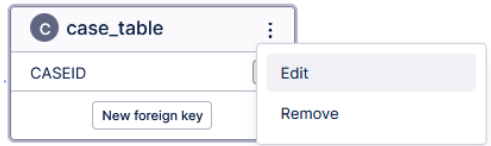
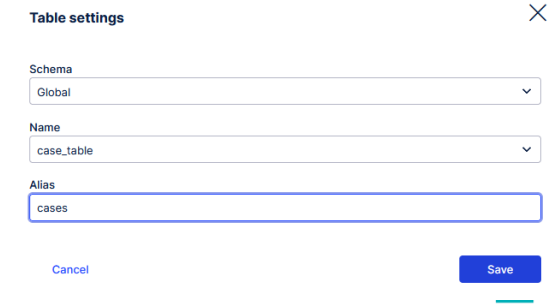


2.





Use of (shorter) aliases can make typing queries faster.

Task 1: Process Explorer configuration

a) Add a new sheet to your analysis and use the Process Explorer component to discover the DFG.

b) Move the sliders so that you can see 99% of all activities.

c) Adjust the configuration so that the arcs show the mean duration in hours.

d) In the component settings, change the color of the activity icons the following way: “Resolve ticket” should be green, “Wait” should be red, and “Take in charge ticket” should be yellow.

Task 2: Exploration

a) Using a Pie Chart component, visualize the distribution of the values for the case attribute Ticket type.
b) Using a Pie Chart component, visualize the distribution of the values for the case attribute Membership.
c) Using a Pie Chart component, visualize the distribution of the combined values for the case attributes Ticket type and Membership together.
d) Using a Histogram Chart component, visualize the number of occurrences for the throughput time in days. In the advanced options, select the Specific bucket count and set it to 10 (buckets). This will divide your values into 10 equal-width buckets.

Task 3:Throughput times (case-level)

a) Create two Single KPI components of type Number. One of them must compute the 0.3 Quantile value of the throughput times in days. The other one must compute the 0.7 Quantile value of the throughput times in days. Provide a screenshot of both components.

Task 3:Throughput times (case-level)

b) Create a case-based situation table containing the following columns:

1. **Case identifier**
2. **Case ticket type**
3. **Case membership**
4. **Decision (*Wait* or *No Wait*): *Wait* if the case contains activity Wait at least once and *No Wait* otherwise.**
5. **Last priority: Priority is an event attribute which is set every time activity “Assign seriousness” occurs. Here, the last Priority value of each case is needed.**
6. **Throughput time category (*slow*, *normal*, or *fast*): If the throughput time (in days) is lower than the 0.3 quantile, the value must be set to *fast*. If the throughput time (in days) is higher than or equal to the 0.7 quantile, the value must be set to *slow*. Otherwise, the value must be set to *normal*.**

Task 3:Throughput times (case-level)

c) Remove the case id (column 1) and export the table. Import it into RapidMiner and discover a decision tree using “Throughput time category” (column 6) as response variable (label).

Task 4:Throughput times (event-pair-level)

a) Create an event-pair-based situation table containing the following columns:

1. **Case identifier**
2. **Case ticket type**
3. **Case membership**
4. **Source activity**
5. **Target activity**
6. **Source resource**
7. **Target resource**
8. **Waiting time between source and target event in *hours***

Task 4:Throughput times (event-pair-level)

b) We are only interested in event pairs corresponding to pairs of activities: “Take in charge ticket” and “Resolve ticket”. Apply the necessary filter to your OLAP table from a). Show the table after applying the filter.

Task 4:Throughput times (event-pair-level)

c) Add another column (column 9) to your table and name it “Waiting time category”. If the waiting time in hours before the source and the target event is lower than 3, the value should be *short*. Otherwise, the value should be *long*.

Task 4:Throughput times (event-pair-level)

d) Remove the columns 1,4,5, and 8 and export the table. Import it into RapidMiner and discover a decision tree using column 9 (waiting time category) as response variable (label).