

STEVENS
INSTITUTE OF TECHNOLOGY
1870

Becoming a Shark at the Data Table

Feature Engineering and Back Again, a Slater's Tale

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Stevens Institute of Technology

- Private, Non-Profit
- Hoboken, New Jersey
- ~4,000 Undergrad
- ~4,000 Graduate students

Goals

Scoring and Modeling

Build Smarter Exports

Think Like a Modeler

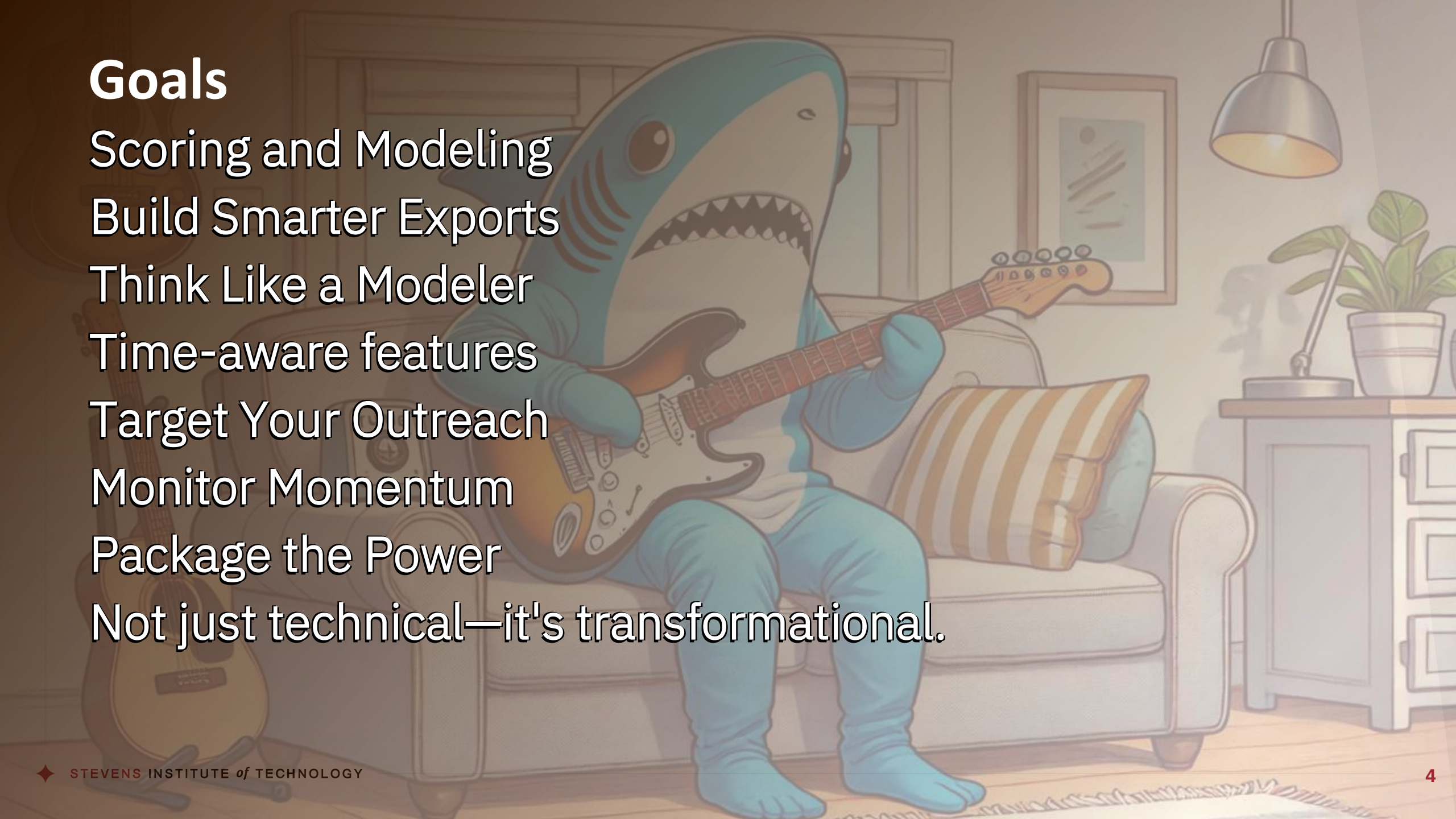
Time-aware features

Target Your Outreach

Monitor Momentum

Package the Power

Not just technical—it's transformational.



Agenda

Flags and Counting Behaviors

Score Bands

Distance

Time-Anchored Behaviors

Streaks

Feature Engineering



Notes

Don’t worry about taking notes!

Suitcase

PDF (48 pages)

Powerpoint

2 Video Walkthroughs building Joins, Filters, and Exports





Behaviors

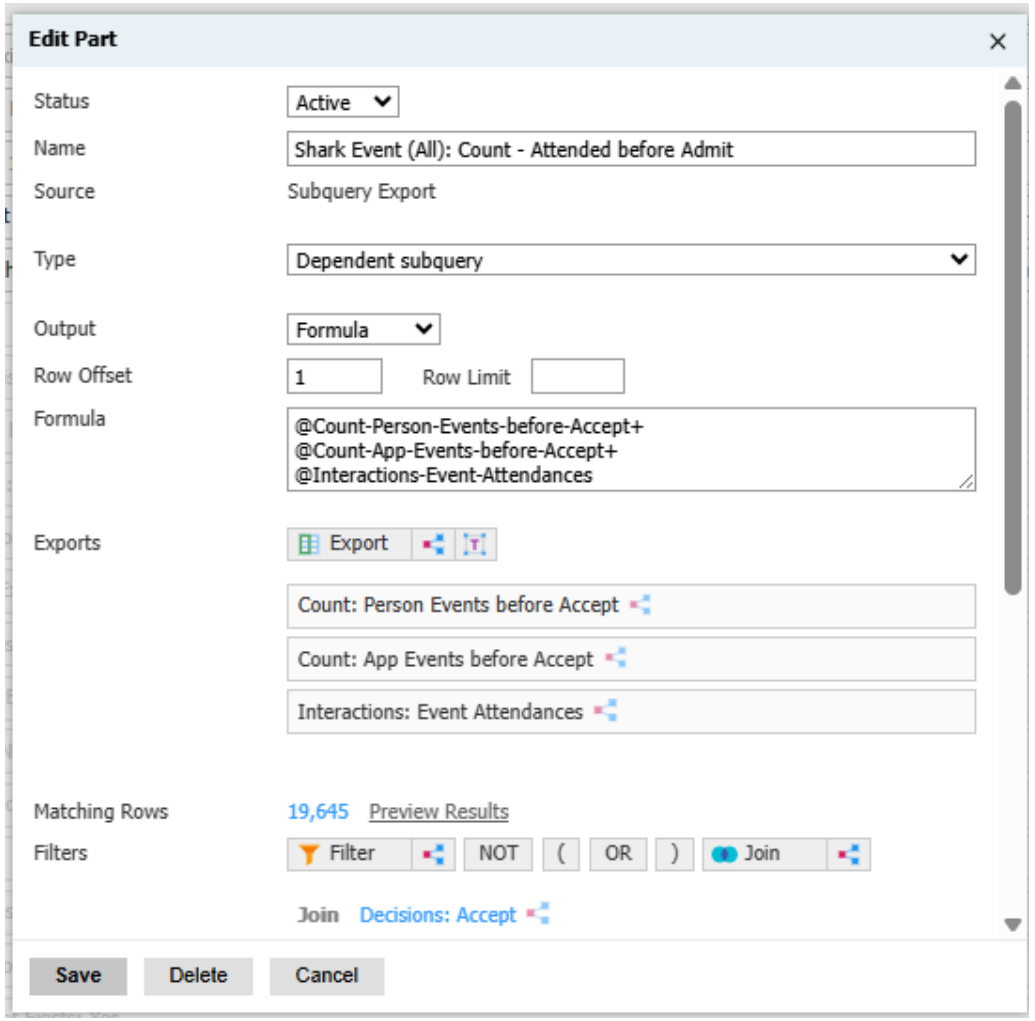
With the Slate Wizard

Behaviors

Counting Behavior

Summing Forms (Person and Application) & Interactions





Behaviors

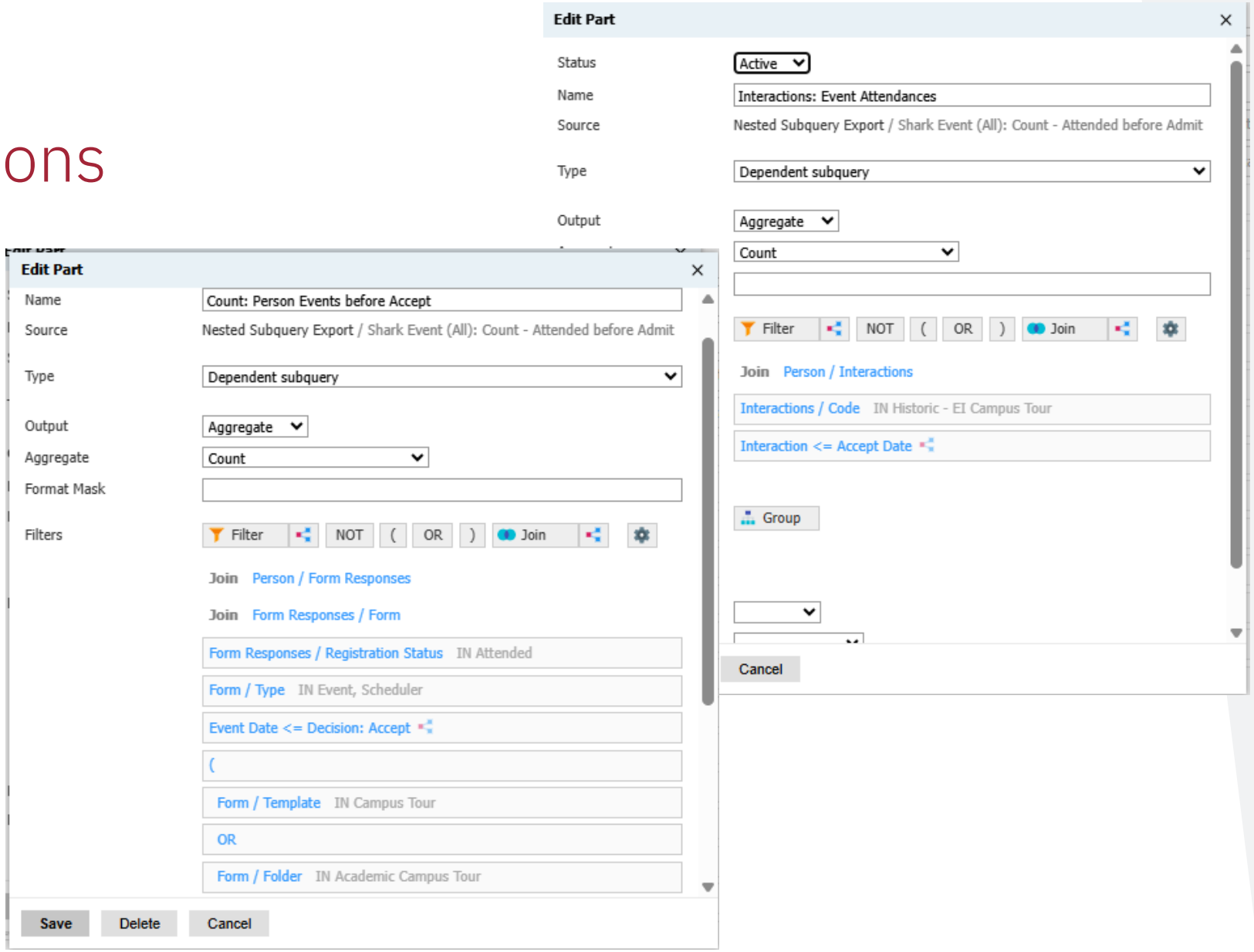
Events and Interactions

Joins

Type

Templates & Folder

Codes



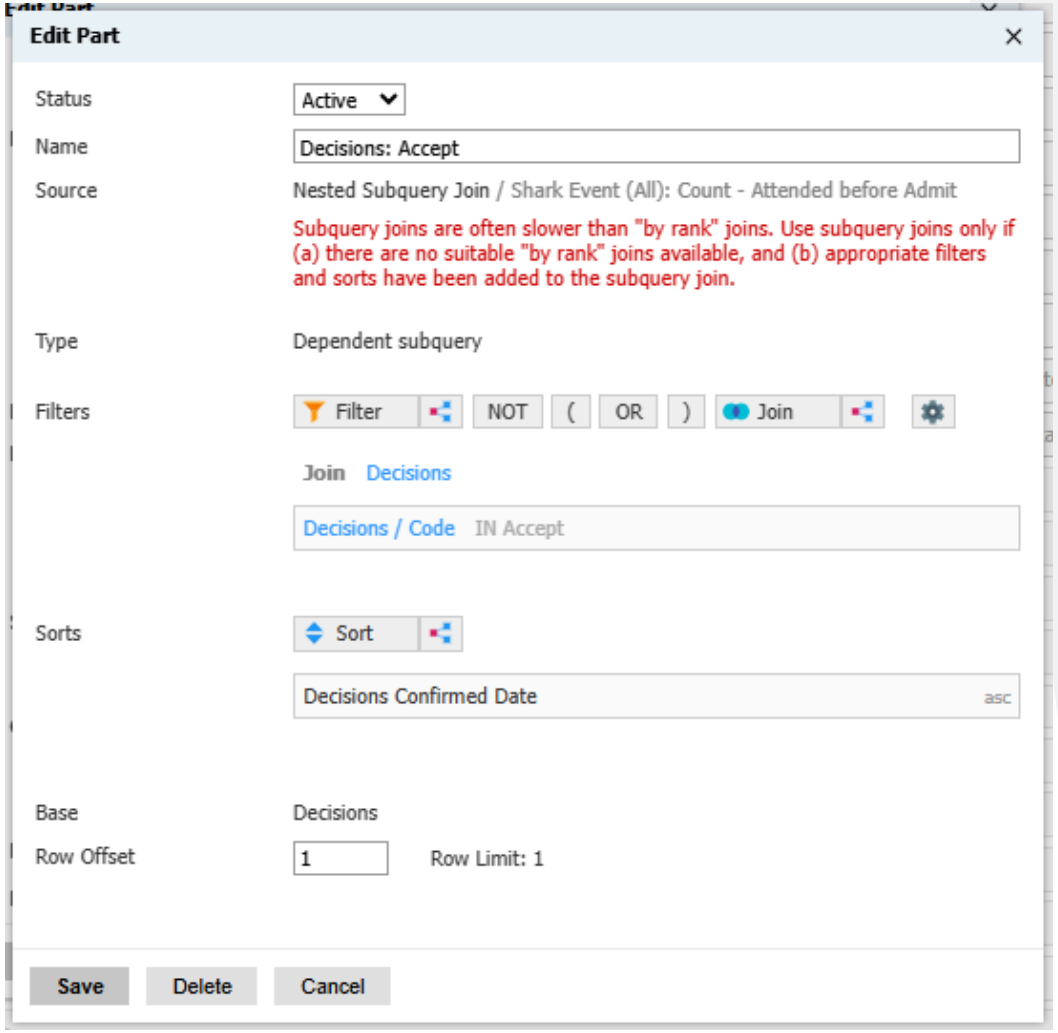
Behaviors

Before or After Decisions

Subquery Join to Decisions

Filter and Sort

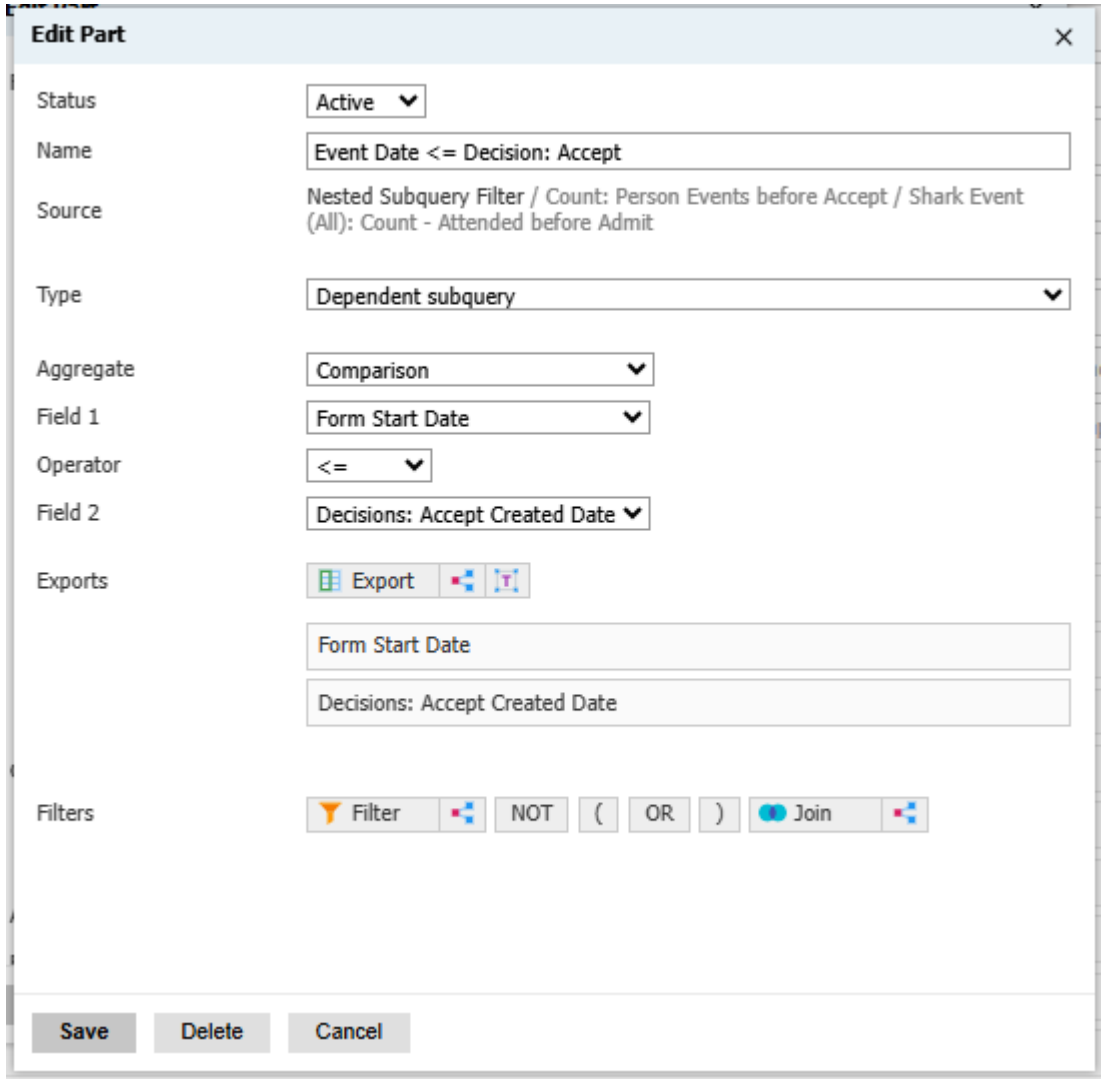




Behaviors

Before or After Decisions

If whole population has the decision



Behaviors

Flagging Existence v1

Formula with Counts



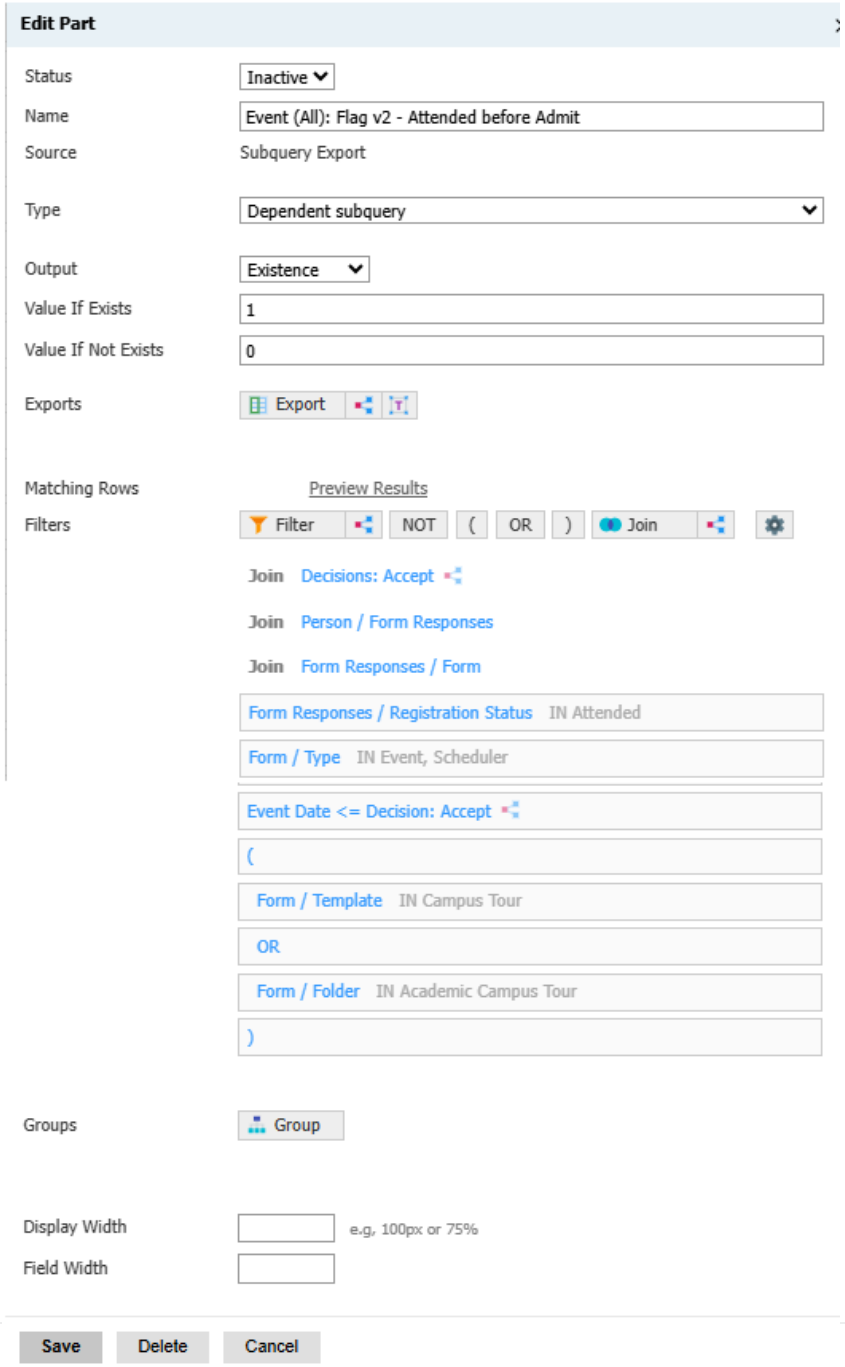
Edit Part

Status	Inactive
Name	Event (All): Flag - Attended before Admit
Source	Subquery Export
Type	Dependent subquery
Output	Formula
Row Offset	1
Row Limit	
Formula	Case when @Count-Person-Events-before-Accept+ @Count-App-Events-before-Accept + @Interactions-Event-Attendances > 0 then 1 else 0 end
Exports	Export
	Count: Person Events before Accept
	Count: App Events before Accept
	Interactions: Event Attendances

Behaviors

Flagging Existence v2

Existence with Filters





Score Bands

With the Fixer

Score Bands

Grouping Buckets of similar outcomes and size



Edit Part

Status	Active
Name	Email Message Click Rate Bands
Source	Subquery Export
Type	Dependent subquery
Output	Formula
Row Offset	1
Row Limit	
Formula	Case when @Emails-Clicked / @Emails-sent >= 1 then 0 when @Emails-Clicked / @Emails-sent >= .7 then 15 when @Emails-Clicked / @Emails-sent >= .5 then 10 when @Emails-Clicked / @Emails-sent >= .2 then 5 else 0 end
Exports	Export
	Emails sent
	Emails Opened
	Emails Clicked
Matching Rows	Preview Results
Filters	Filter NOT (OR) Join
	Join Decisions: Deposit Paid
Sorts	Sort
Groups	Group
Display Width	e.g. 100px or 75%
Field Width	
Export Value	
Format Type	Real
Format Mask	
Null Value	0

Save Delete Cancel

Score Bands

Grouping Buckets of similar outcomes and size

Recoding Bands

Scoring Rubric (100% = 0)

1 Row Limit

```
Case when
@Emails-Clicked / @Emails-sent
>= 1 then 0
when @Emails-Clicked / @Emails-sent
>= .7 then 15
when @Emails-Clicked / @Emails-sent
>= .5 then 10
when @Emails-Clicked / @Emails-sent
>= .2 then 5
else 0 end
```

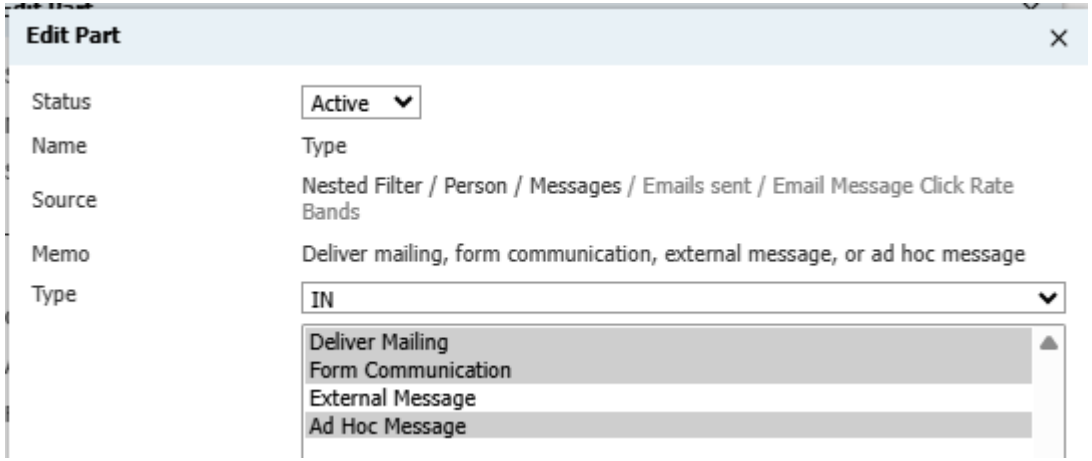
Score Bands

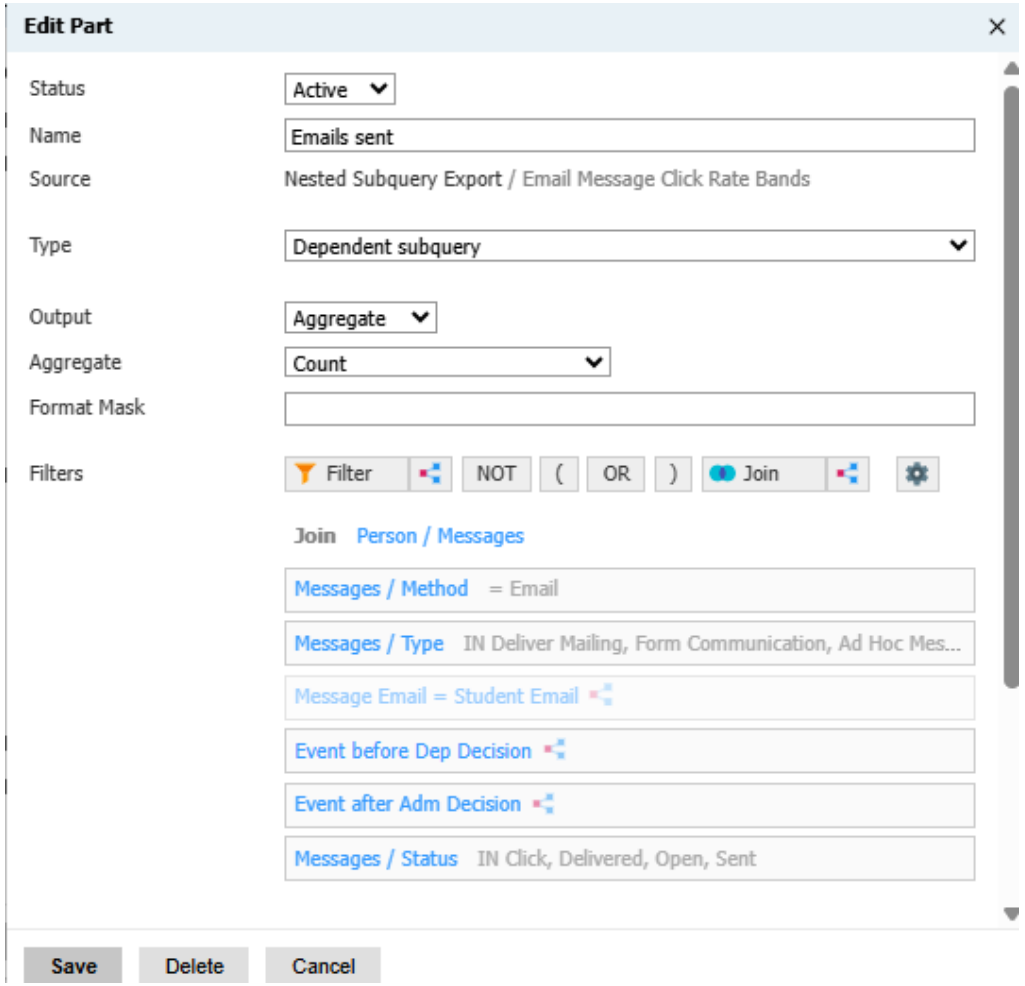
Emails Sent

Method

Type

Status





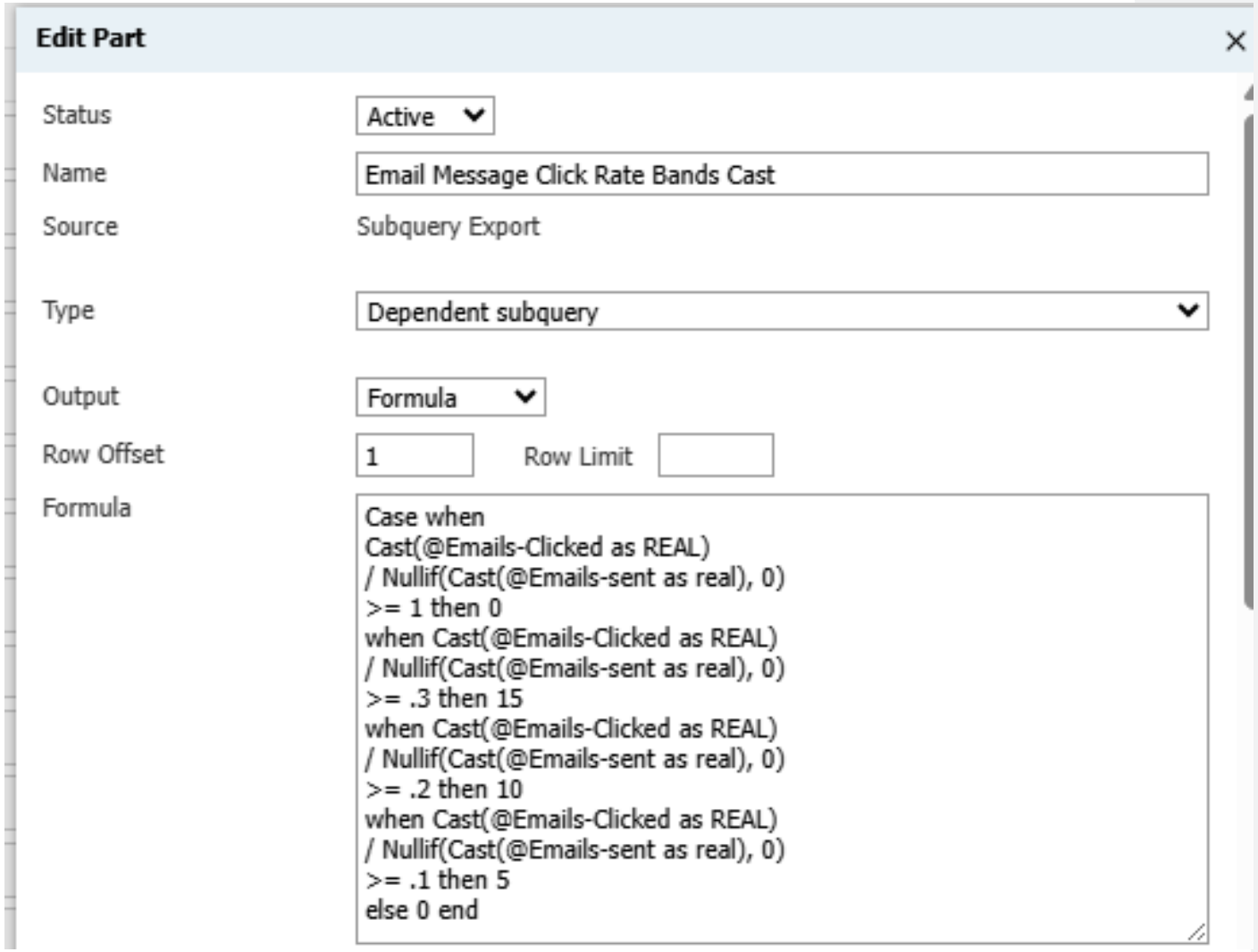
Score Bands

Cast as

NullIf

Case when
Cast(@Emails-Clicked as REAL)

Cast(@Emails-Clicked as REAL)
/ Nullif(Cast(@Emails-sent as real), 0)





Distance

With the Slate *Wildcard*

Distance

How far are students from the Institutions?

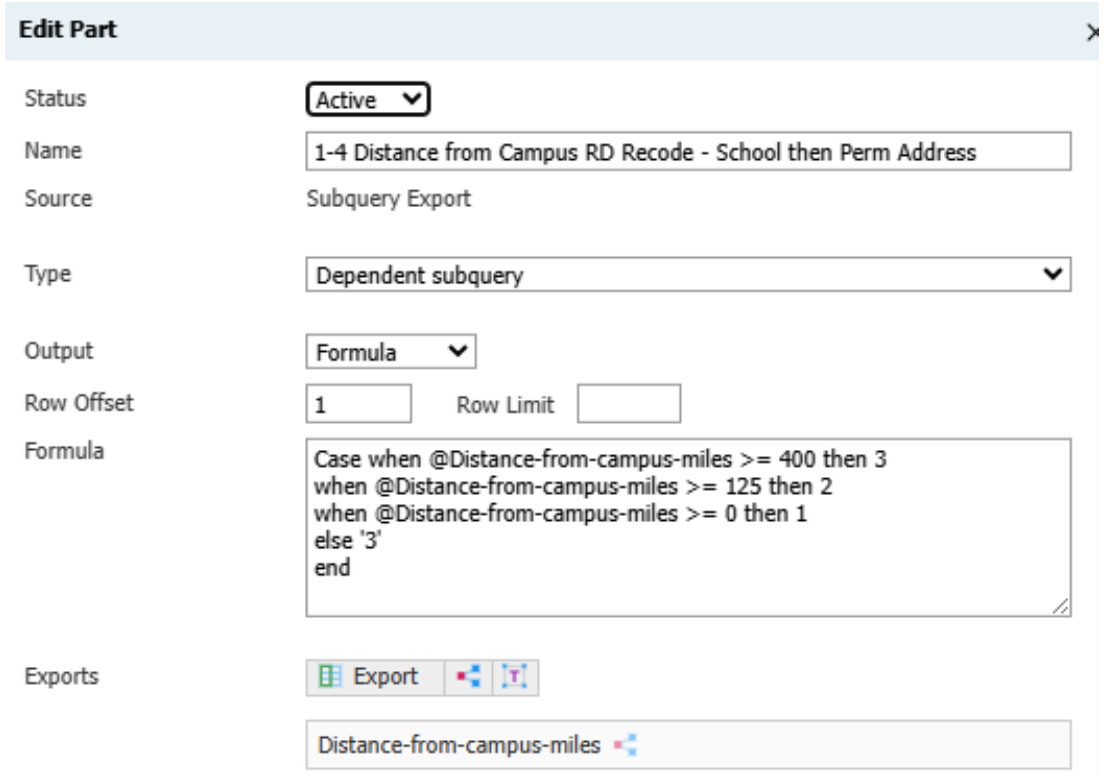
No School/not tied to Org Dataset/Dom. Studying abroad?

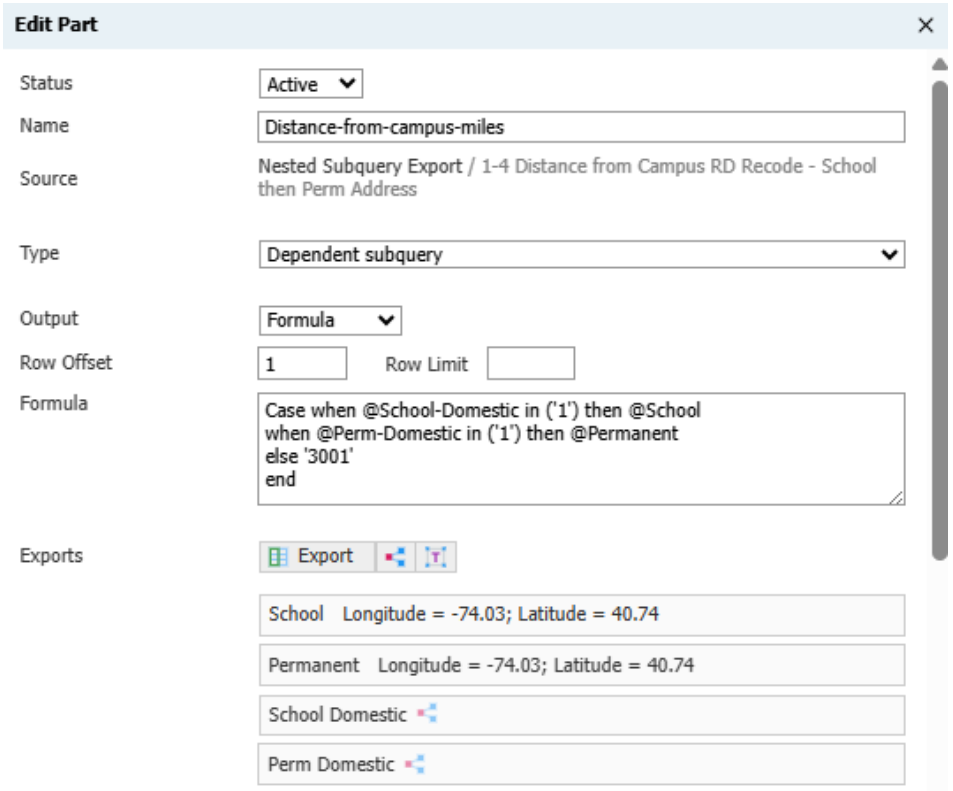


Distance

Calculate distance from Longitude/Latitude

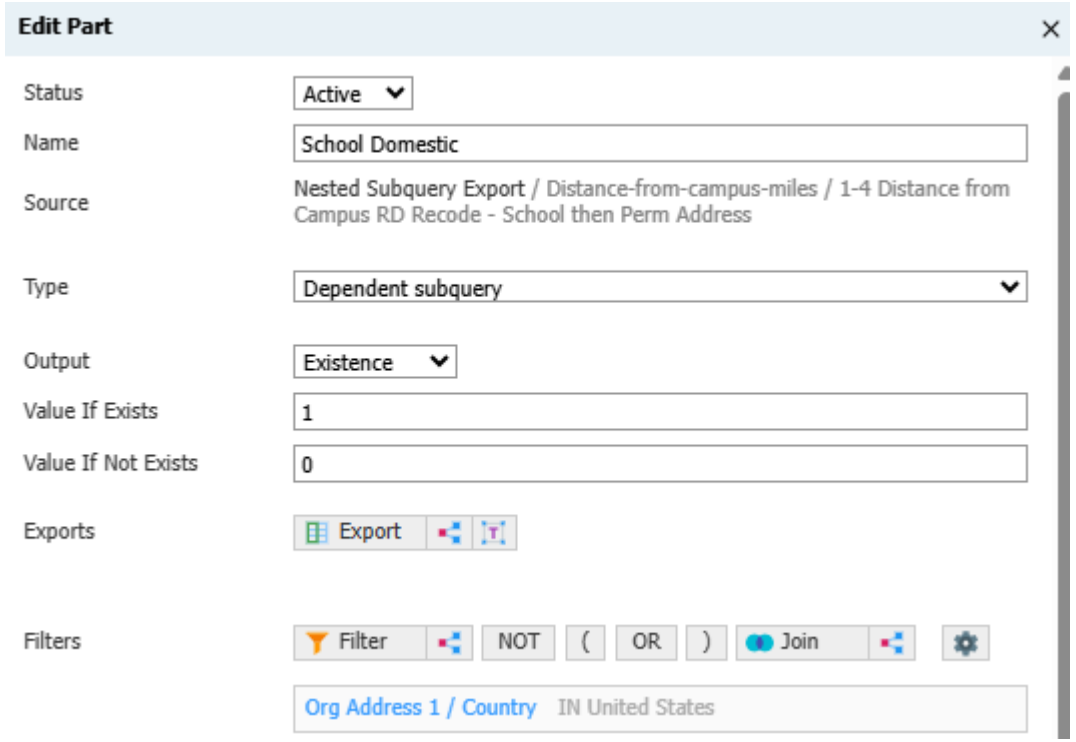
What ranges behave similarly?

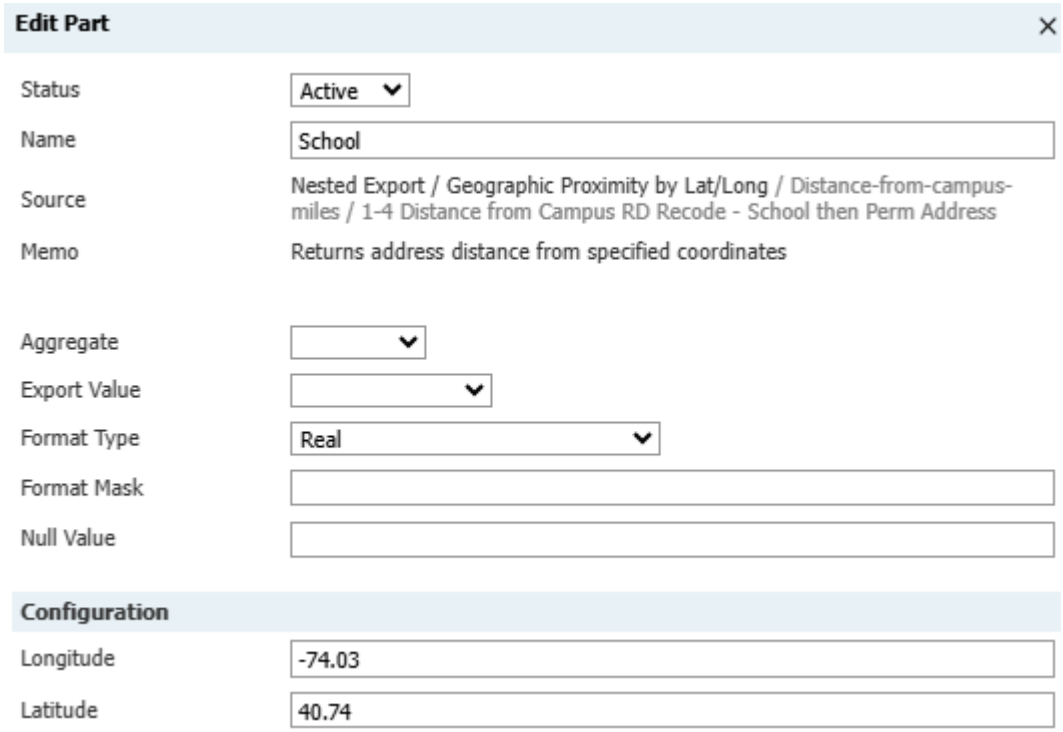




Distance

If School in US, use school distance. If not, use Perm Address when domestic. If not, static value for Intl

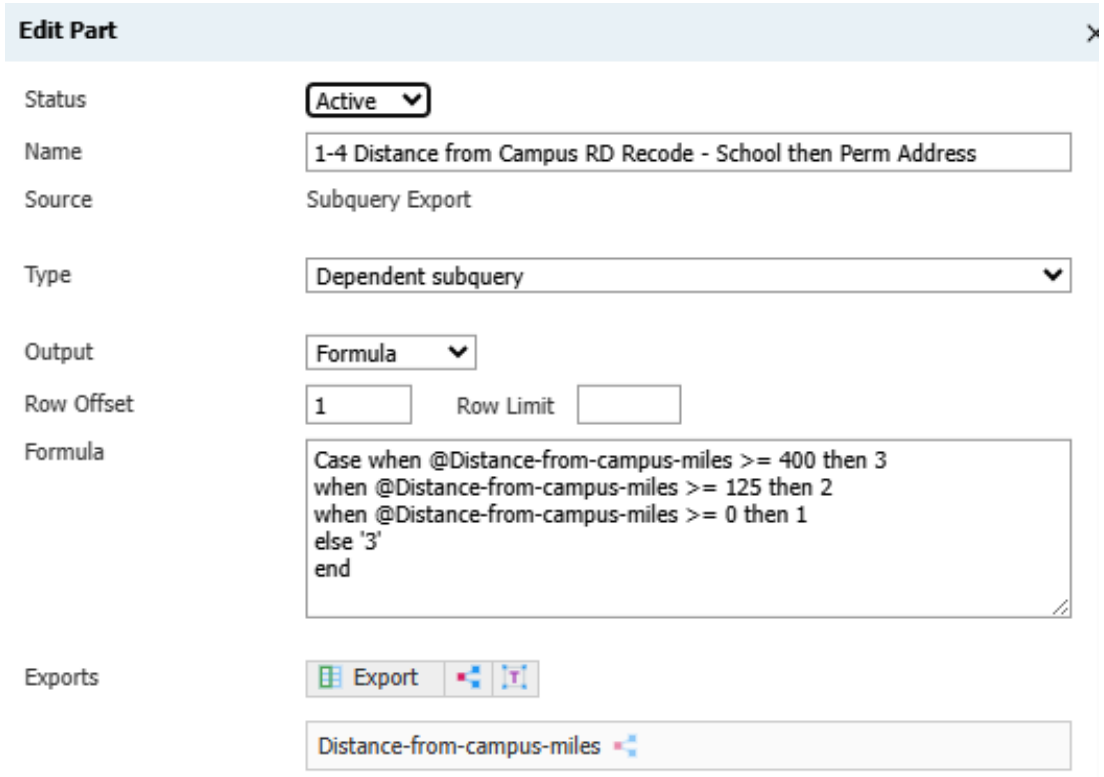


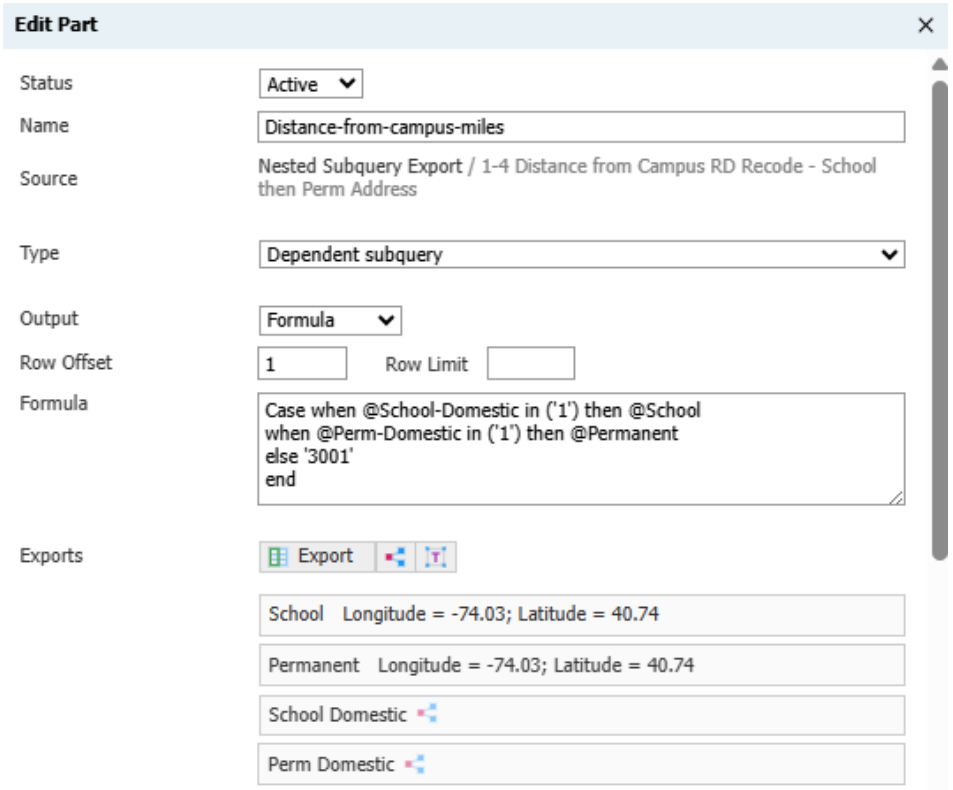


Distance

Calculate distance from Longitude/Latitude

What ranges behave similarly?





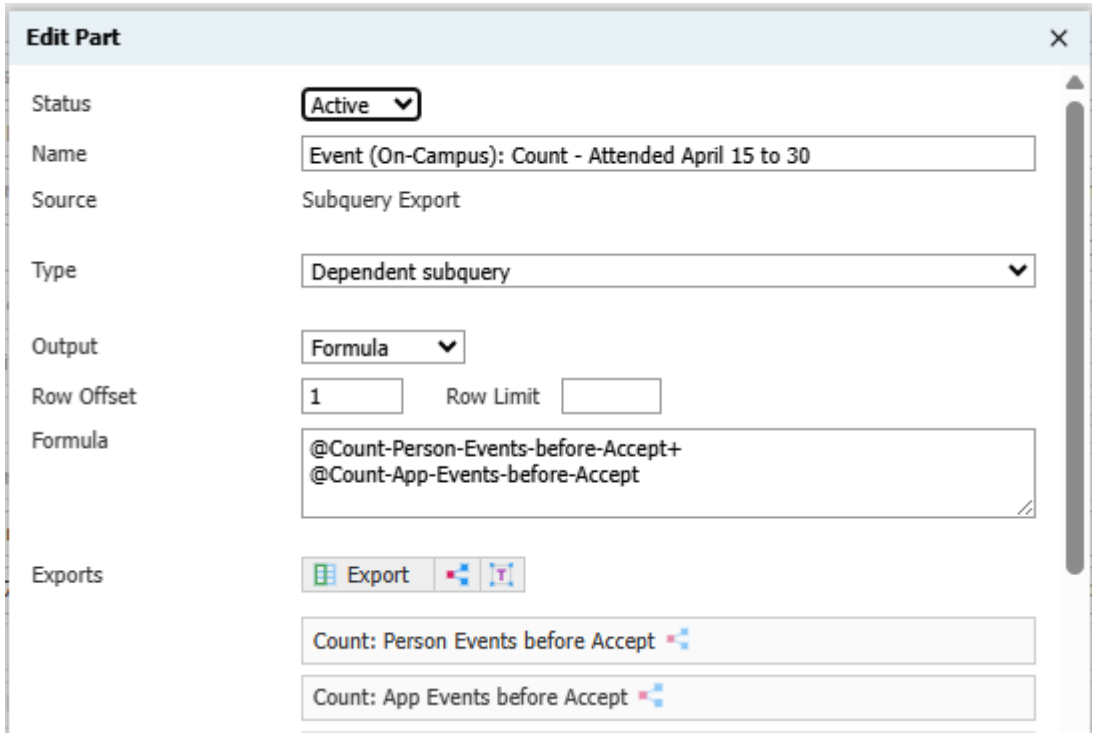


Time-Anchored Behaviors

With the Slate Architect

Time-Anchored Behaviors

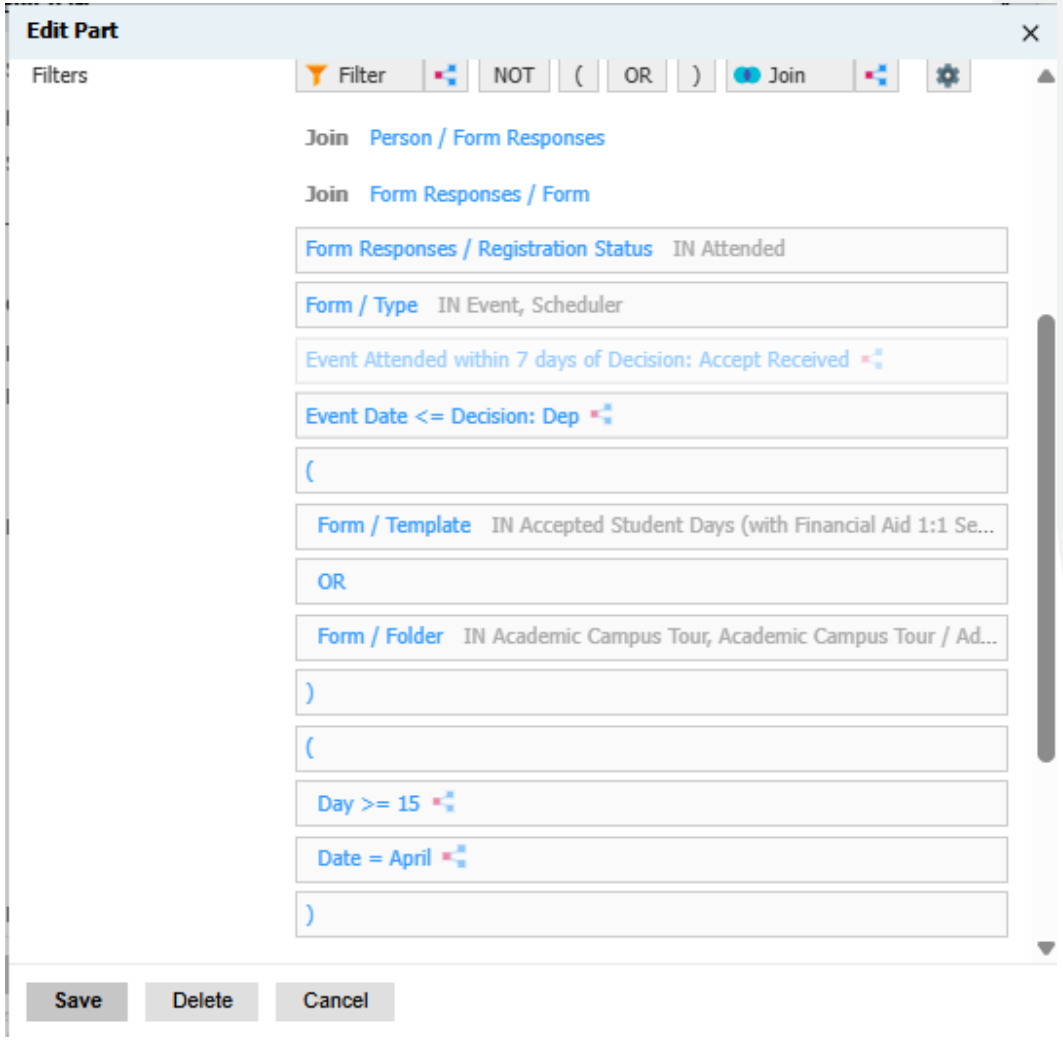
Behaviors between days





Time-Anchored Behaviors

Behaviors counted after a particular month day, accounting for leap years



Time-Anchored Behaviors

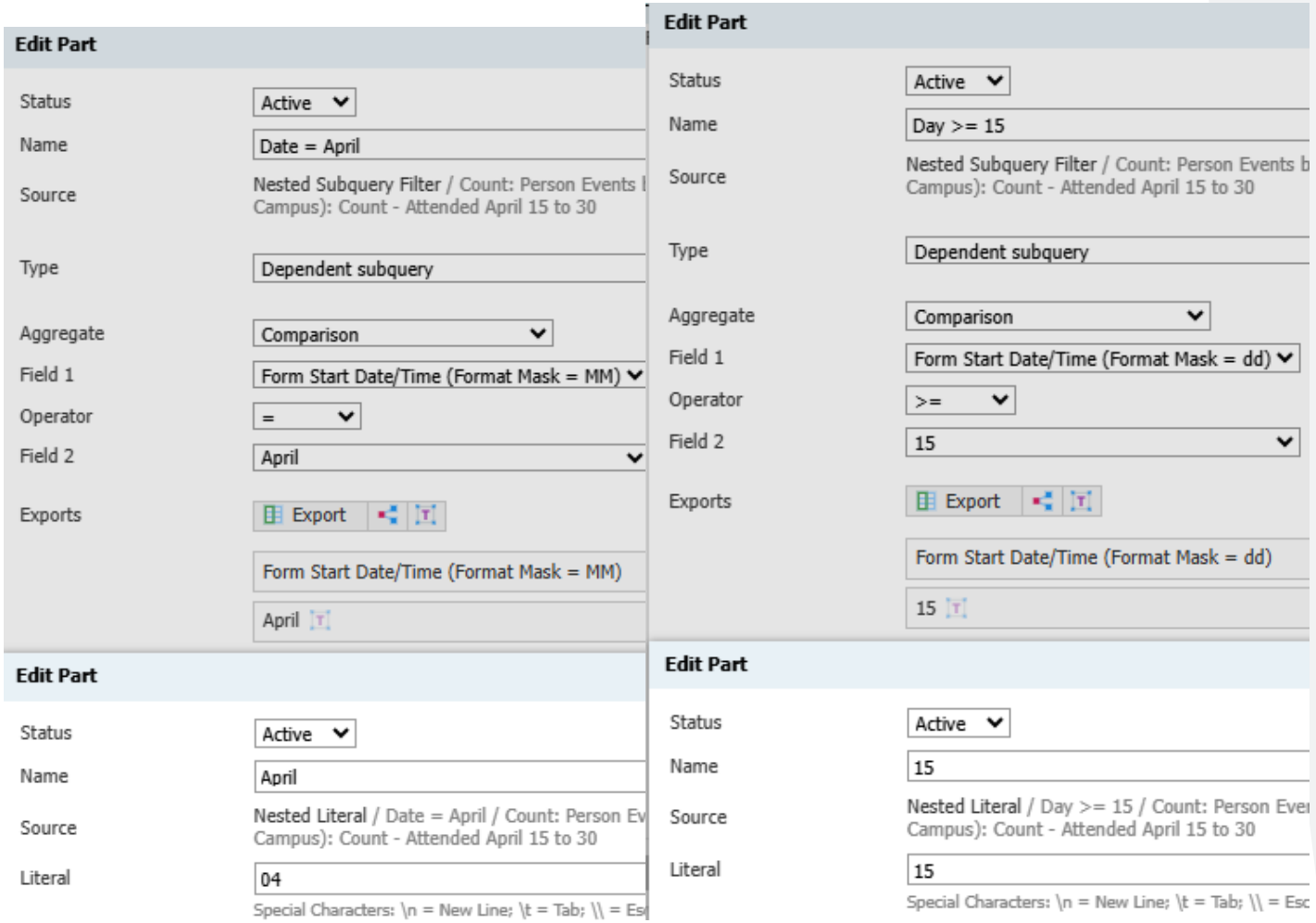
Behaviors between days

Format Form Date, Email Date, Login Date, etc.

MM for month

dd for day

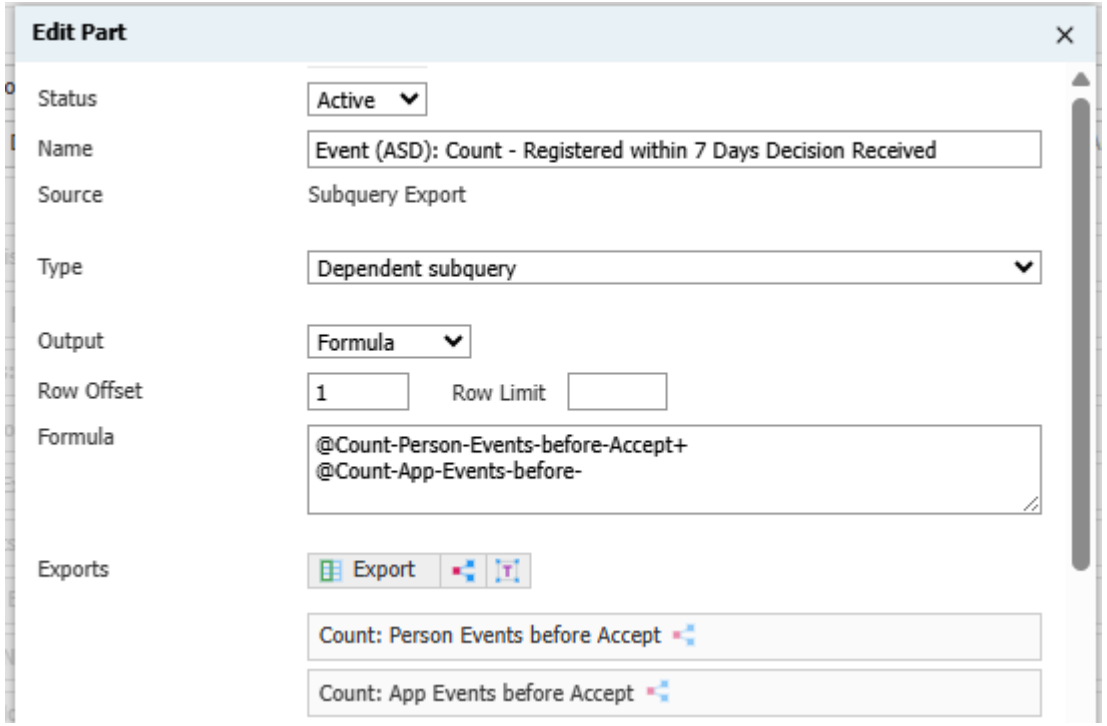
Literal for comparison

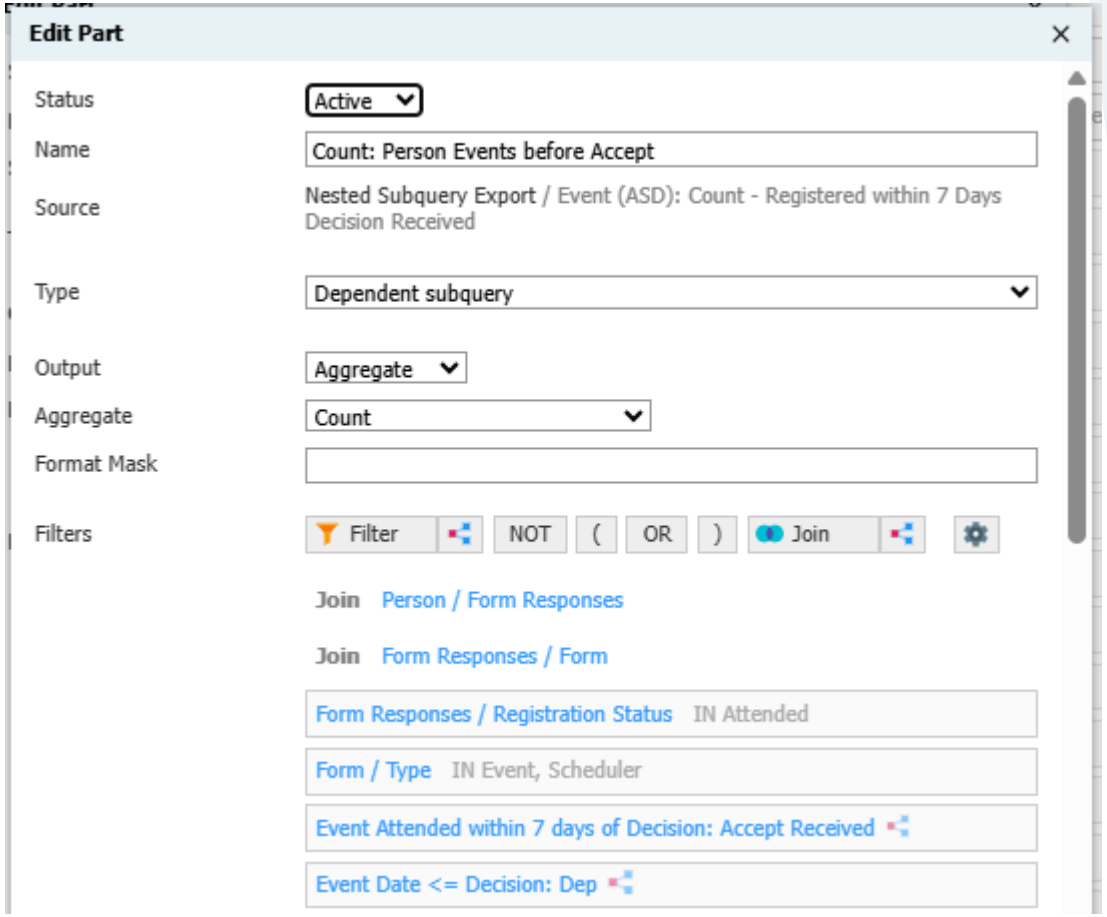


Time-Anchored Behaviors

Behaviors around decisions

Registration W/in 7 days



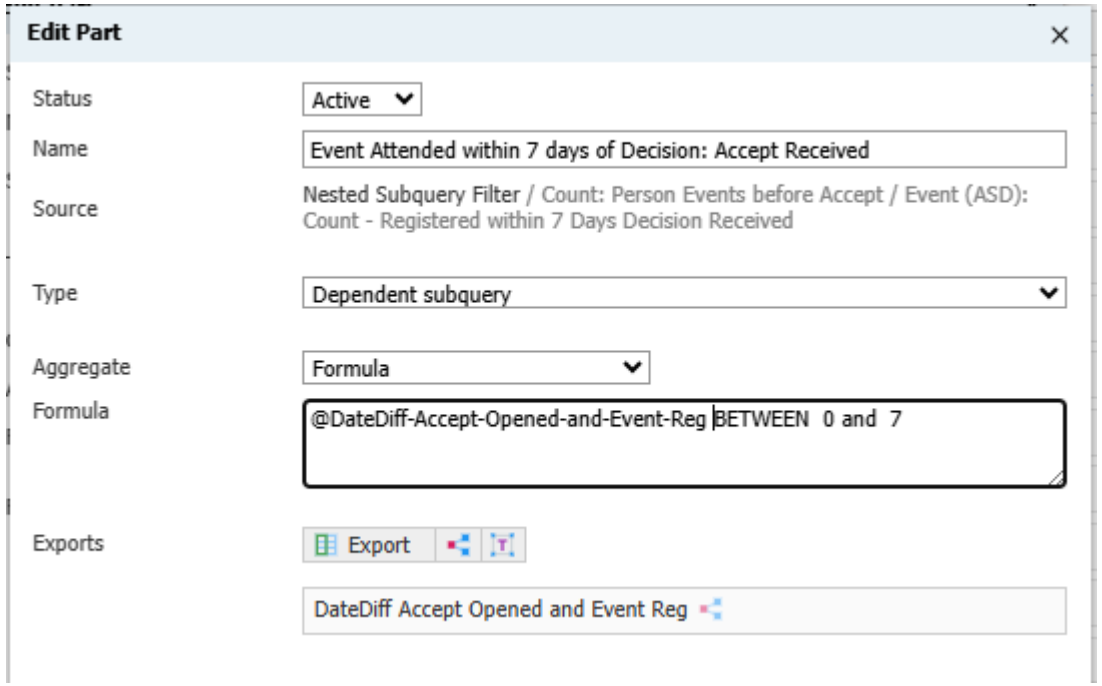


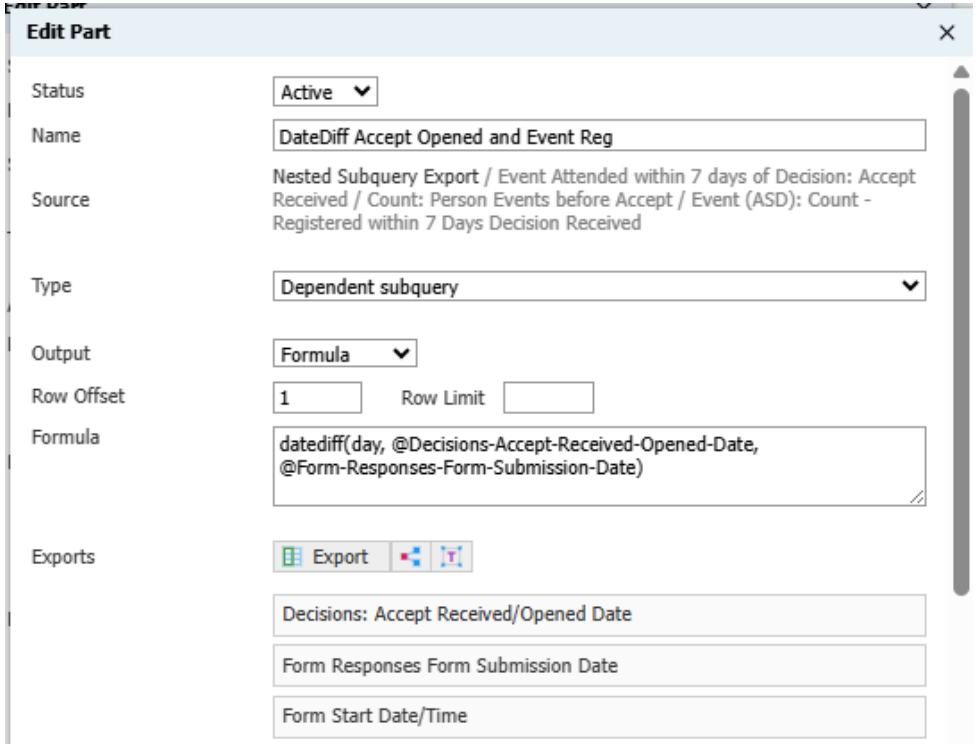
Time-Anchored Behaviors

Behaviors around decisions

Filter is # of days between 0 and 7

Calculate # of days between Decision and For Registration







Streaks

With the Slate Captain

Streaks

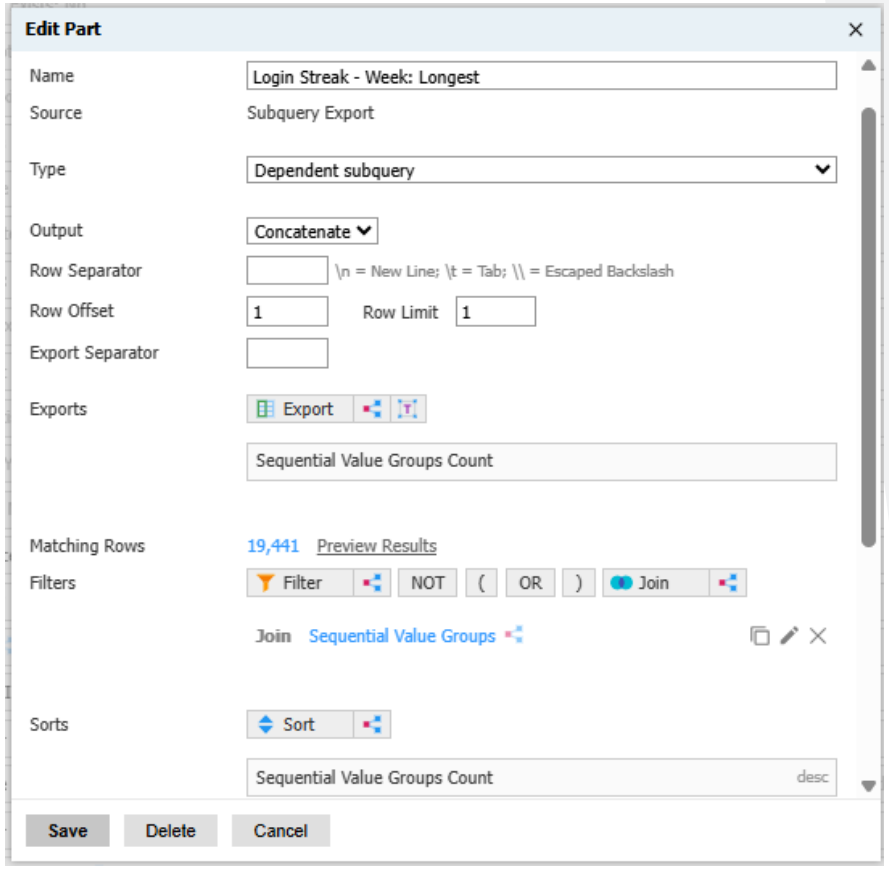
Login Streaks: Longest Weekly Streak

Sequential Value Groups, Row Limit = 1

Export: Count (# of consecutive)

Join to Order by Count Descending





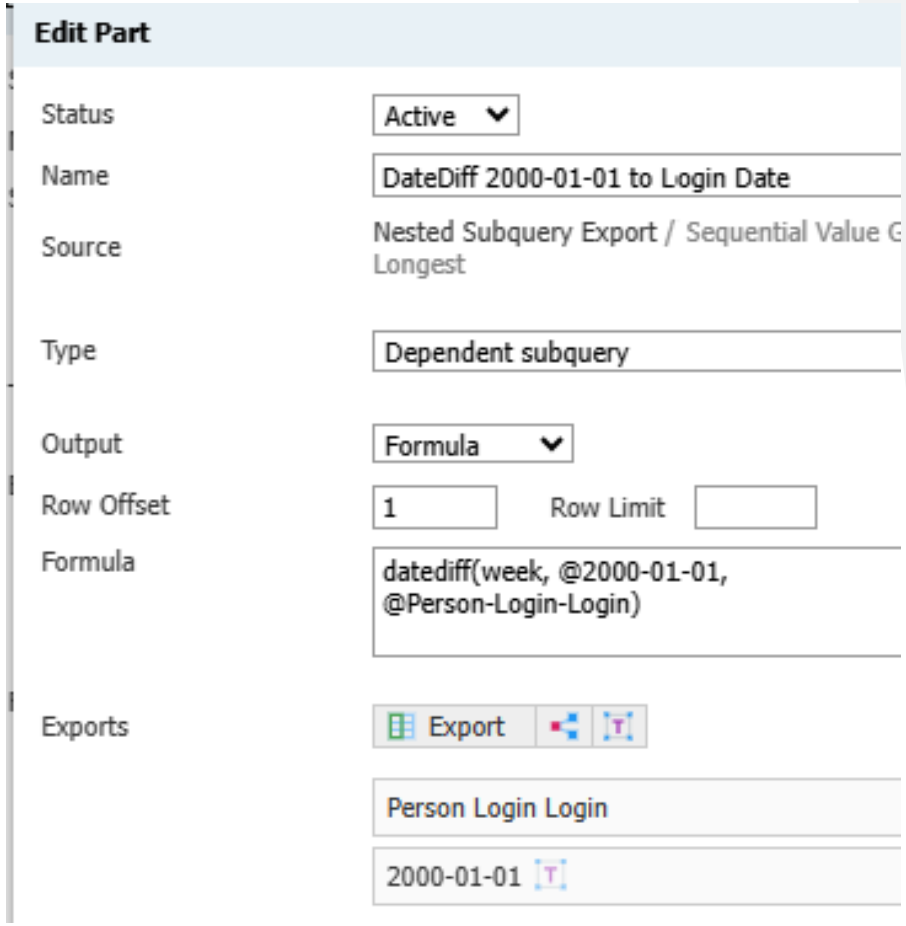
Streaks

Login Streaks: Longest Weekly Streak

Build sequence of weeks

Number of weeks from 1/1/2000

To the Login Date



Streaks

Login Streaks: Day and Dates

Number of consecutive days logged in

Shows date of first and last login in streak

Shows all streaks



Edit Part

Status: Active

Name: Login Streaks - Day

Source: Subquery Export

Type: Dependent subquery

Output: Concatenate

Row Separator: | \n = New Line; \t = Tab; \\ = Escaped

Row Offset: 1 Row Limit:

Export Separator:

Exports: Export

Sequential Value Groups Count

:

Epoch Day to Date Minimum

Sequential Value Groups Min

-

Epoch Day to Date Maximum

Filters: Filter | NOT | (| OR |)

Join: Sequential Value Groups

Sorts: Sort

Sequential Value Groups Count

Streaks

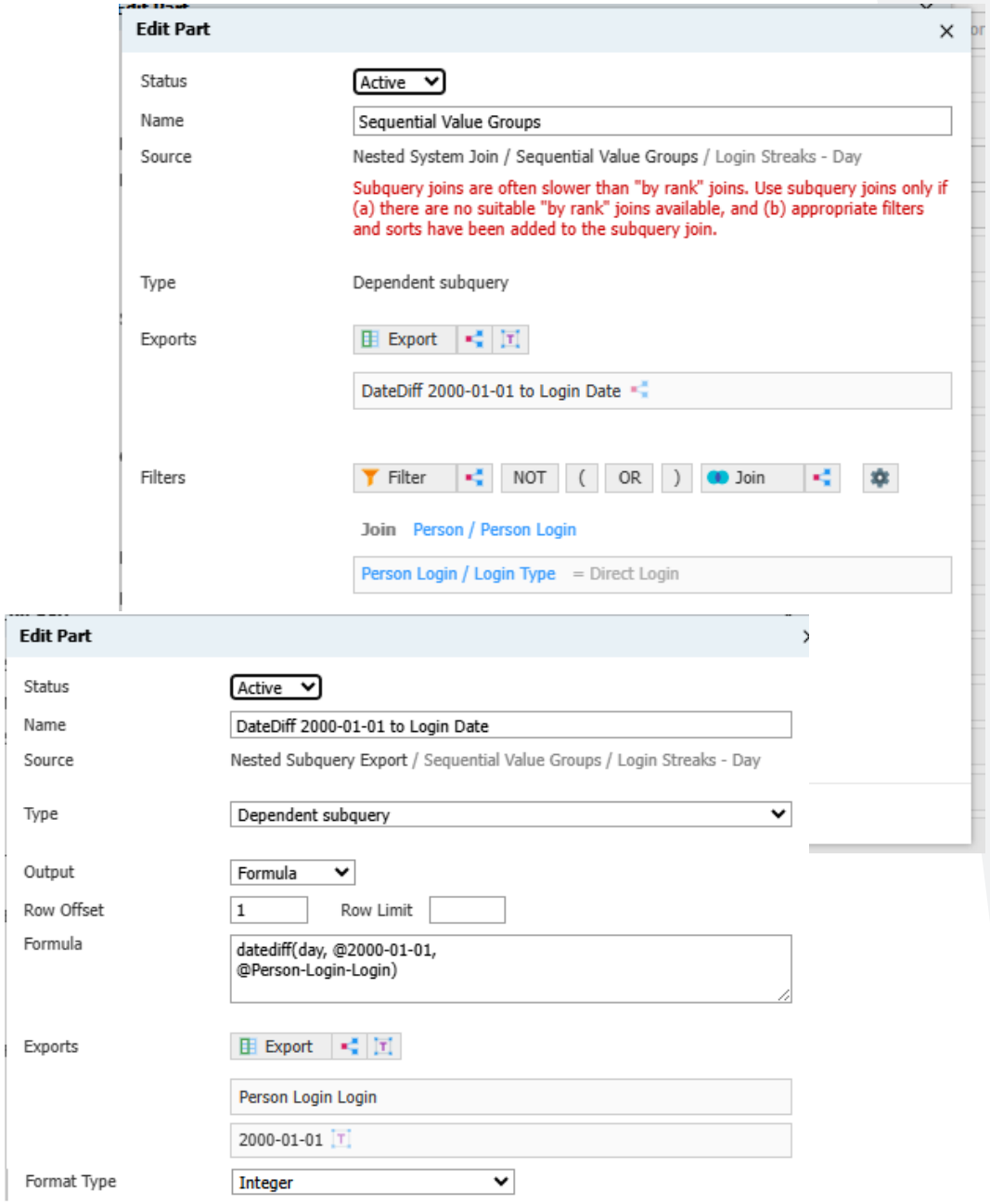
Login Streaks: Day and Dates

Restrict to Direct Logins

Number of days from 1/1/2000

To Login date

Format Type to Integer

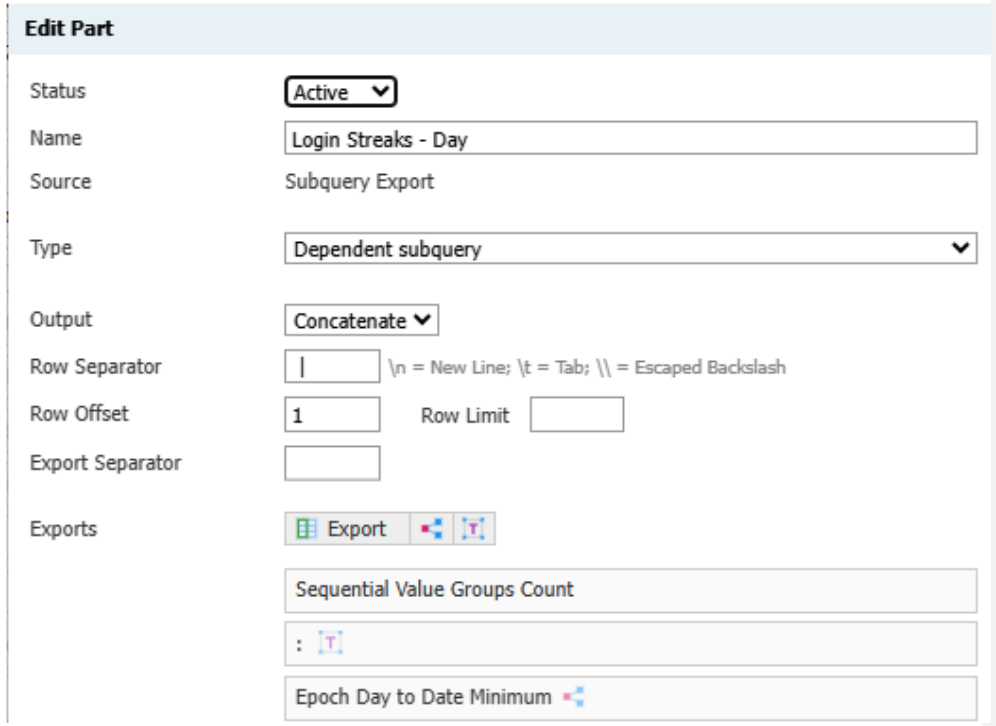


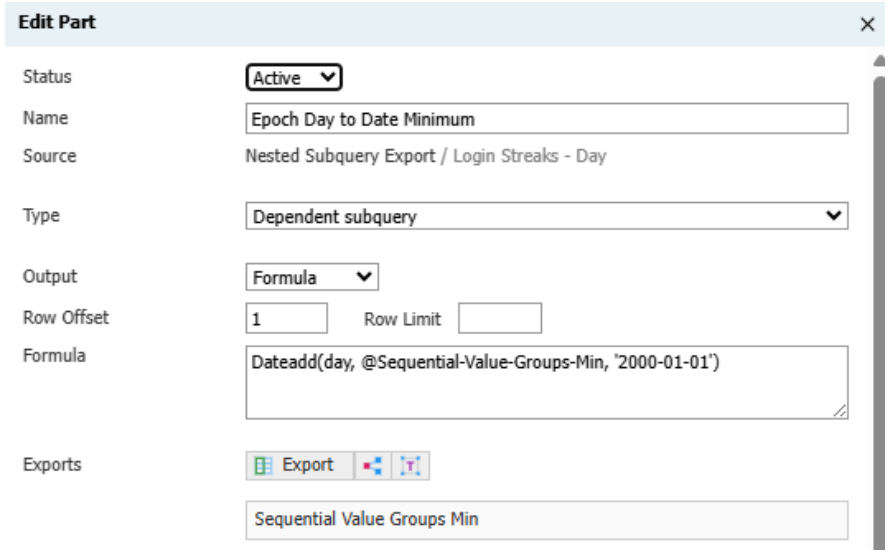
Streaks

Login Streaks: Day and Dates

Create First Login date of streak

Adding number of days back to 1/1/2000





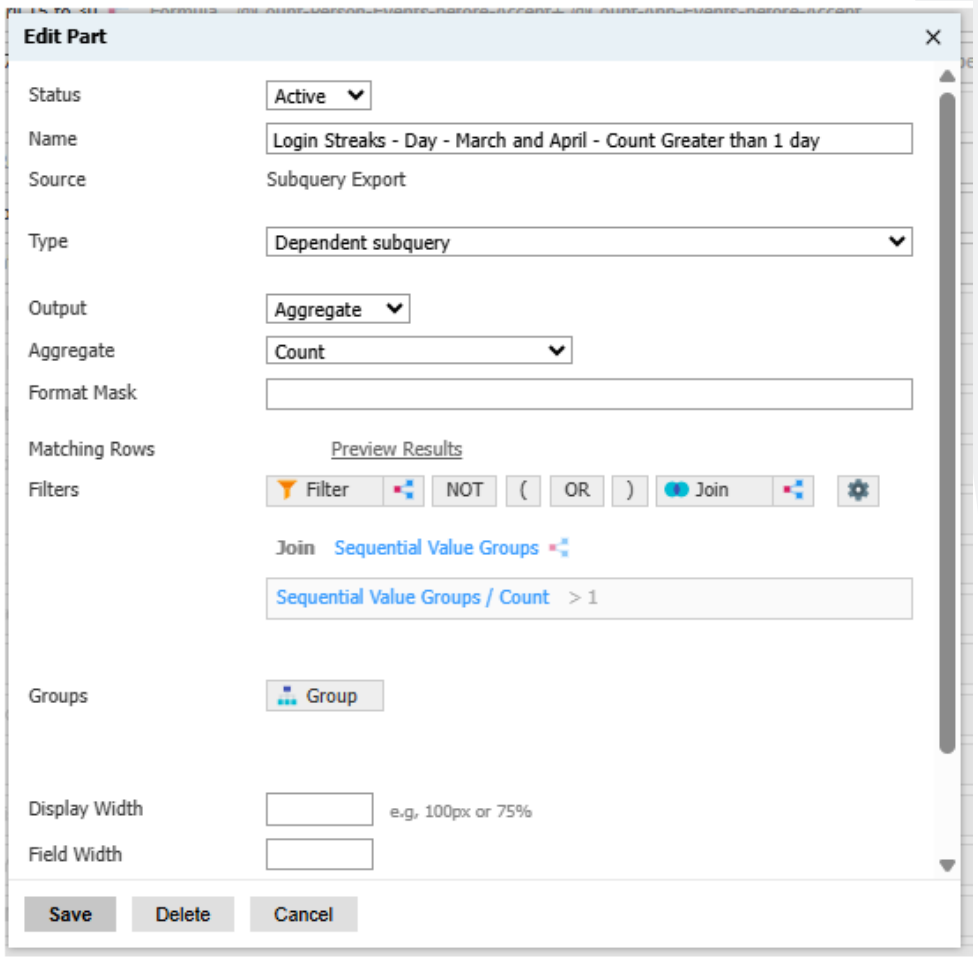
Streaks

Login Streaks: Counting 2+ day streaks

Only Count login streaks:

where streak > 1 day

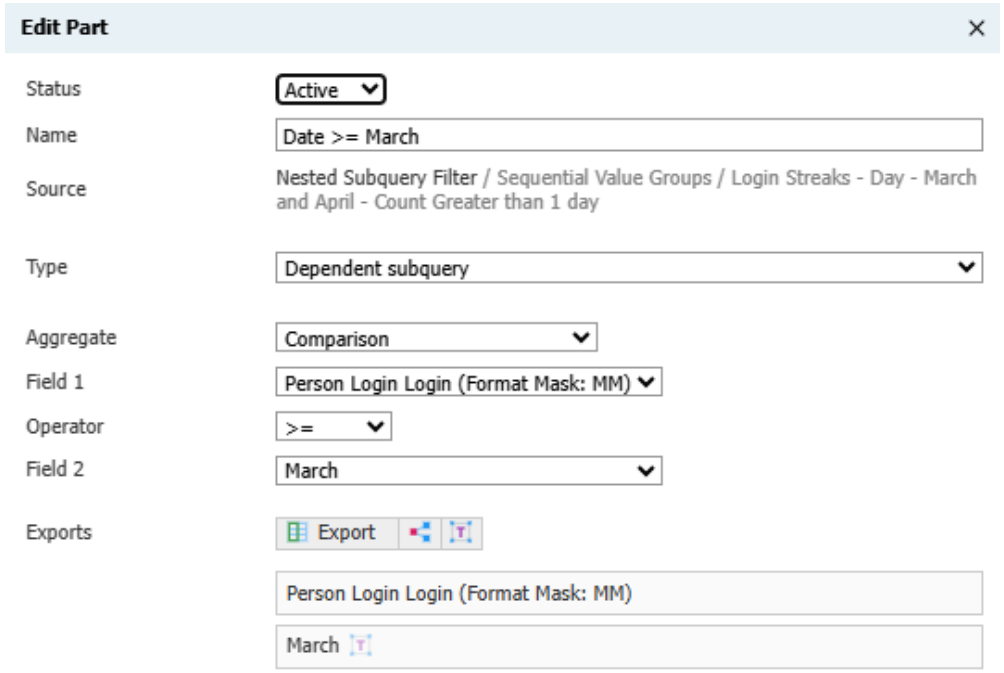


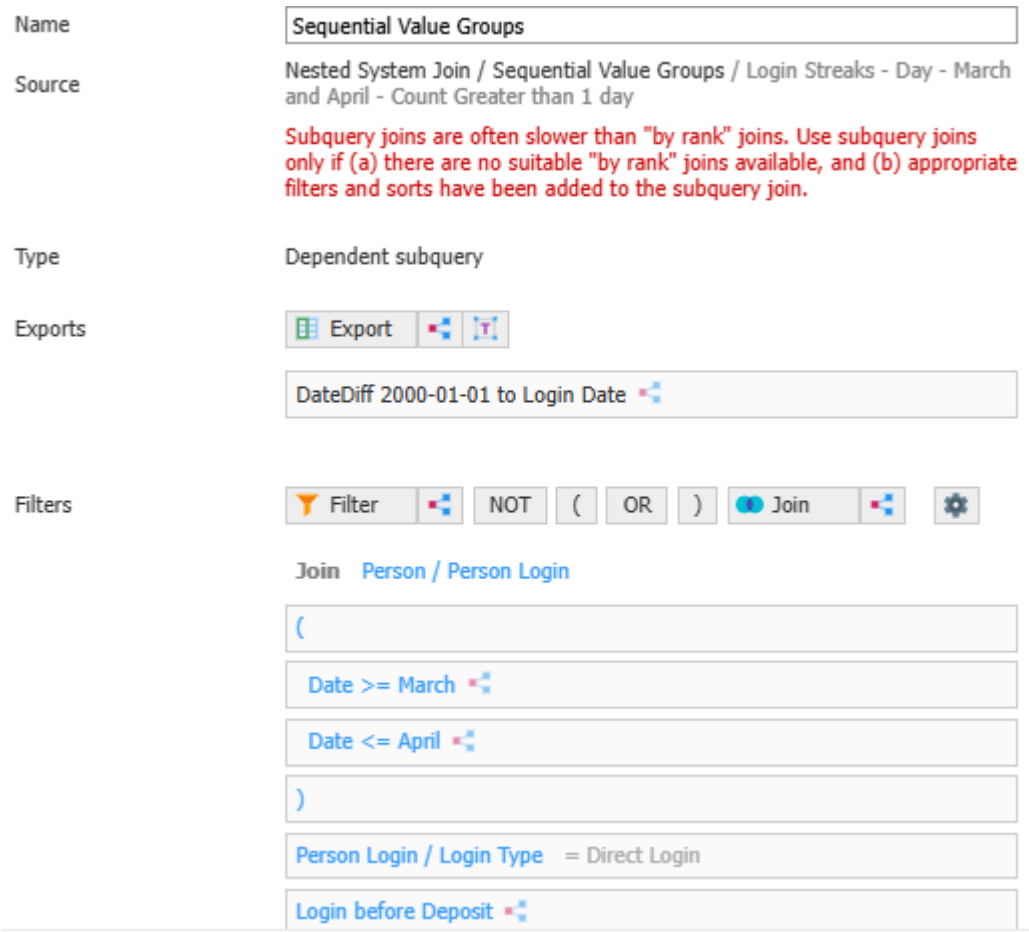


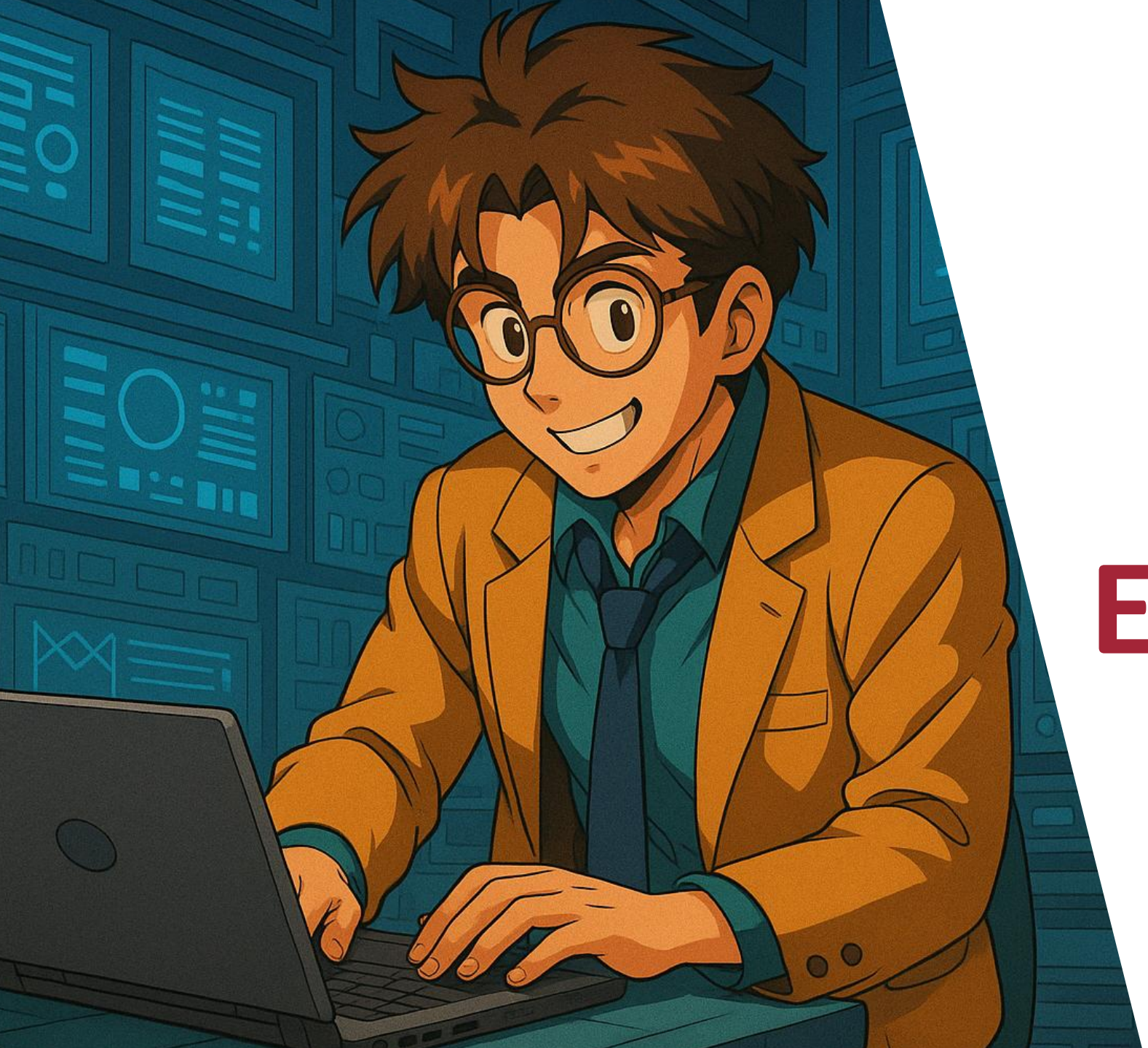
Streaks

Login Streaks: Counting 2+ day streaks

Only count Logins in March And April







Feature Engineering

With the Techno Whiz

Feature Engineering

App/Deposit/Default dates

Count Logins before Deposit

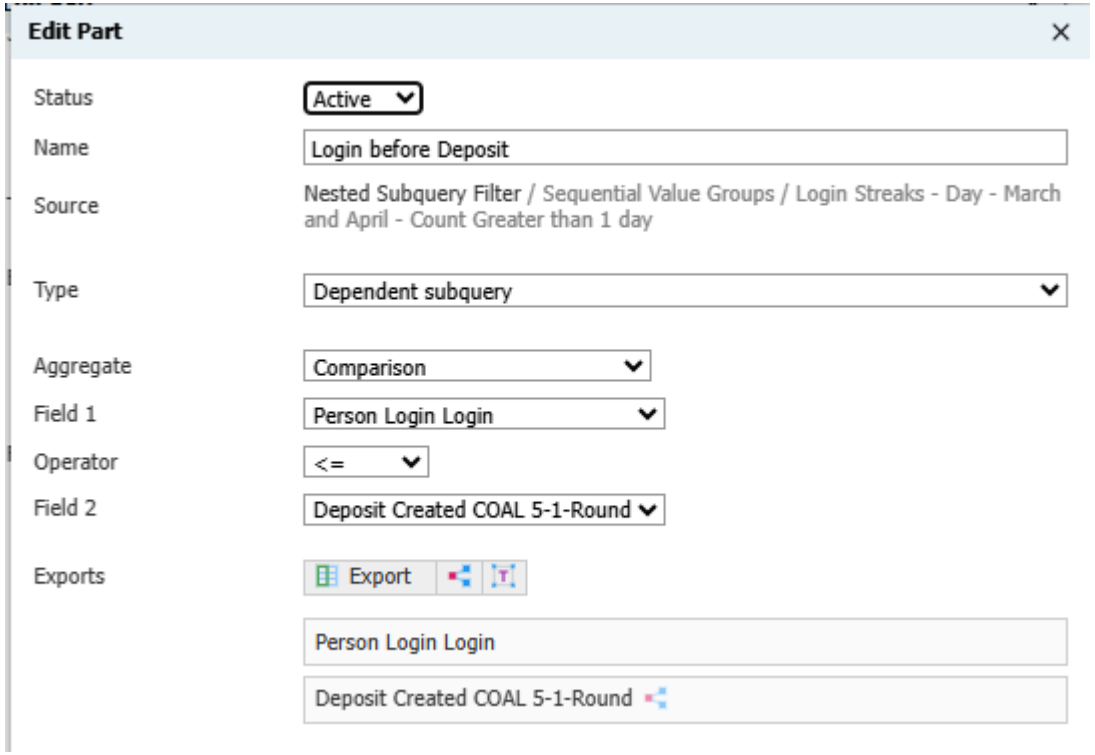
But what if they never deposit?

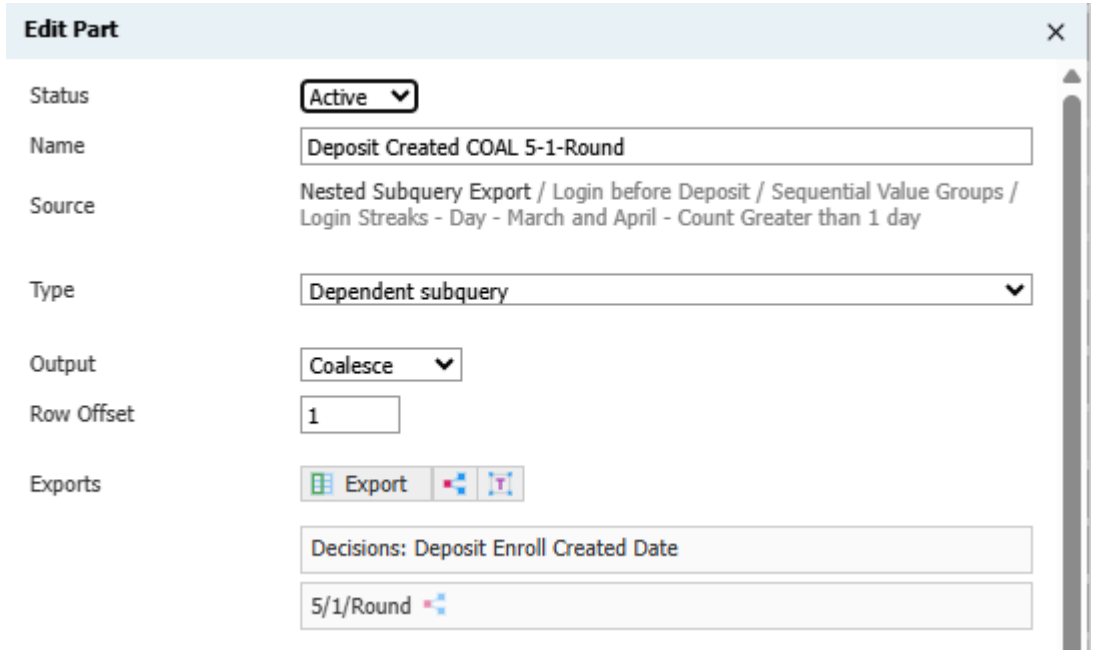


Feature Engineering

App/Deposit/Default dates

Coalesce Deposit Date then Deadline date

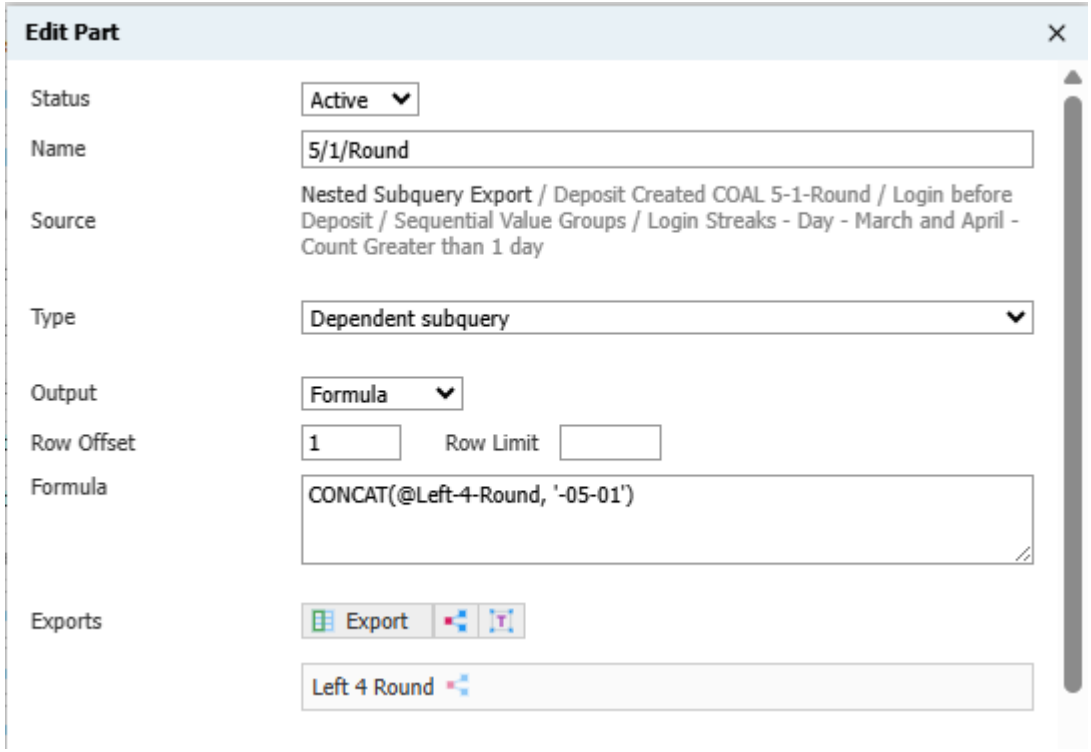


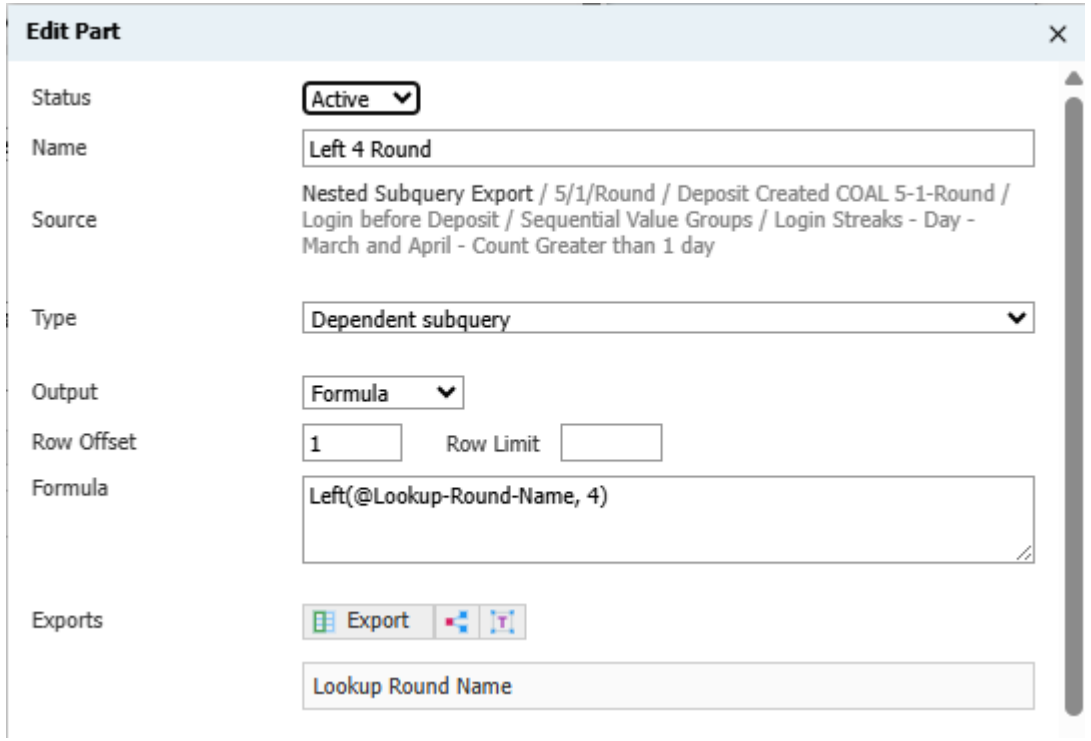


Feature Engineering

App/Deposit/Default dates

Use their Round or Period to create the year of the deadline to automate YoY

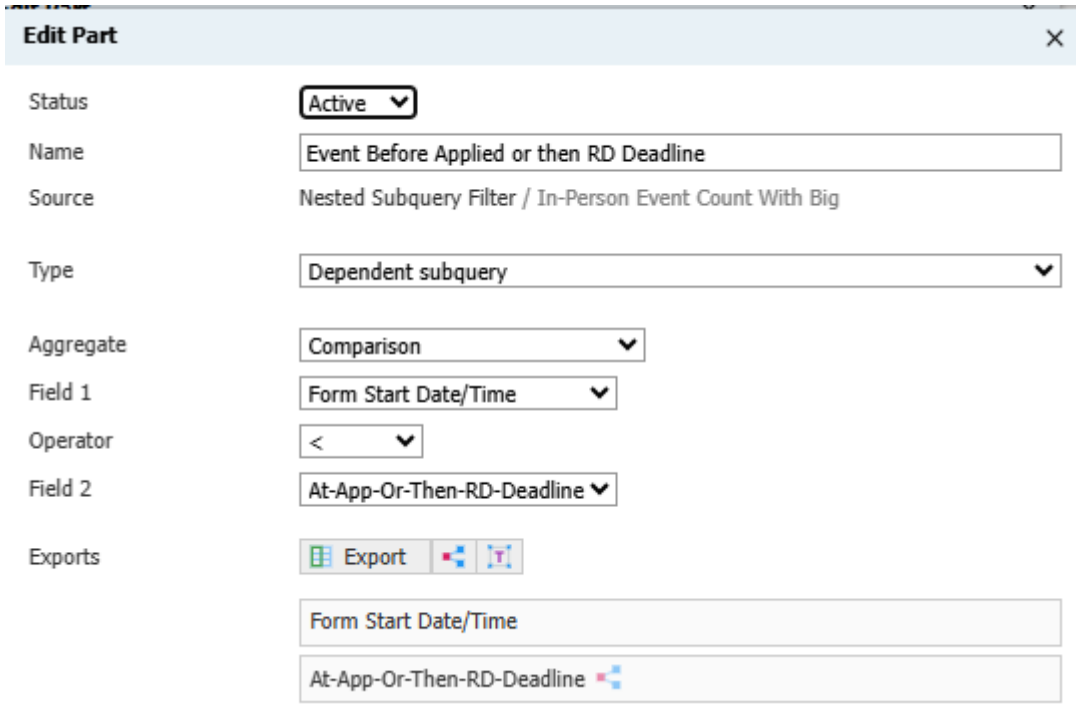




Feature Engineering

App/Deposit/Default dates

At Application or App Deadline



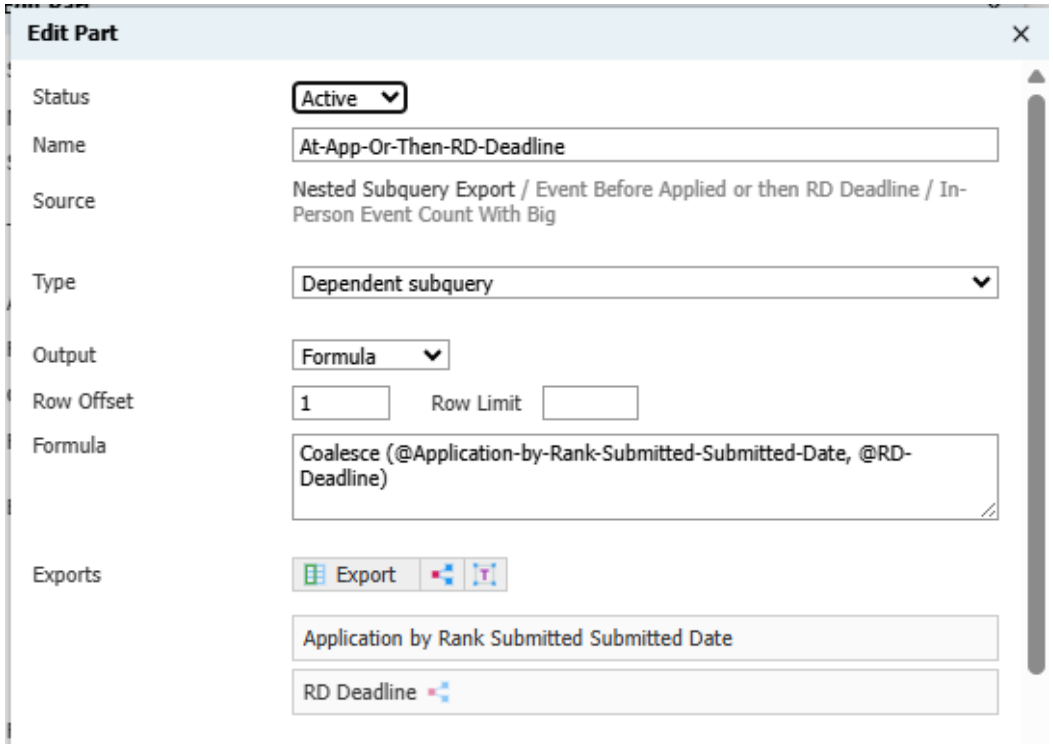


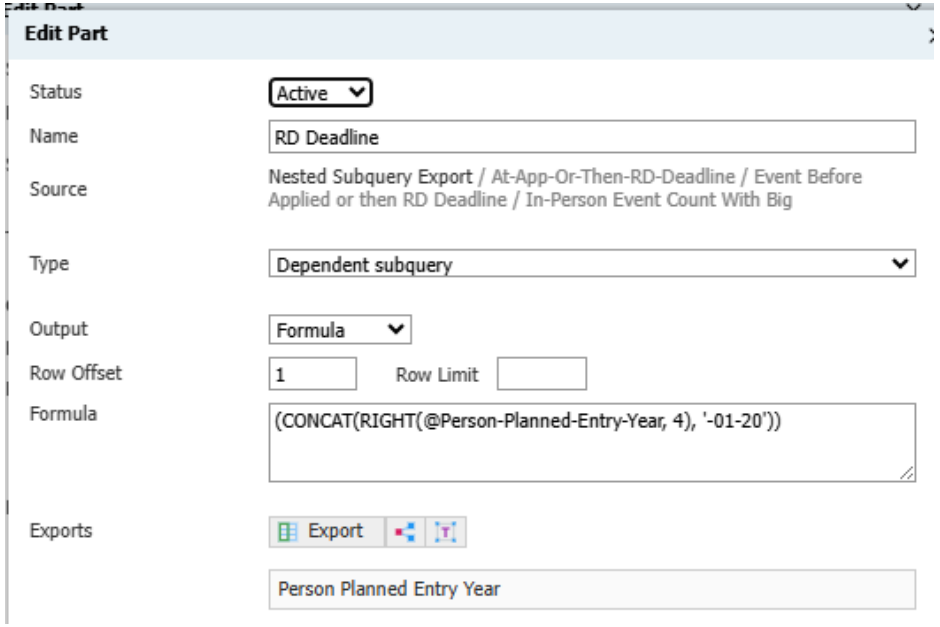
Feature Engineering

App/Deposit/Default dates

At Application or App Deadline

Use Planned EntryYear





Feature Engineering

Historical Tracking Entity and Daily Average Changes

Fields

New Field

Scope	Category/Tab	Name	Prompt
Historical Score Tracking	Score	Entity Score: Date	
Historical Score Tracking	Score	Entity Score: Historical Score Type	score_type
Historical Score Tracking	Score	Entity Score: Total	
Historical Score Tracking	Score	Entity Score: Total DAILY INCREASE	



Edit Record in Entities

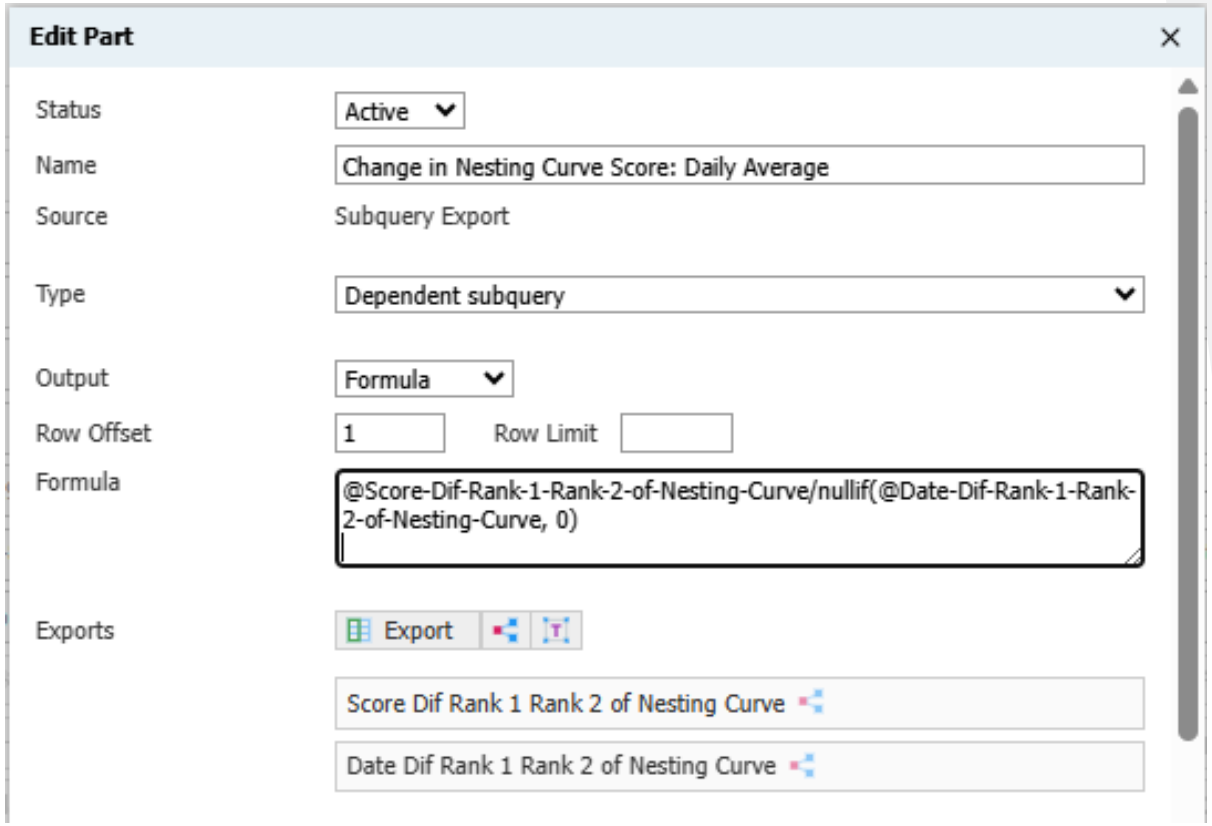
ID	3b524fa3-e50b-4ee6-8a07-16aaf633eb06
Status	Active
Folder	Entities
Name	Historical Score Tracking
Scope Insert	
Scope	Application

Feature Engineering

Historical Tracking Entity and Daily Average Changes

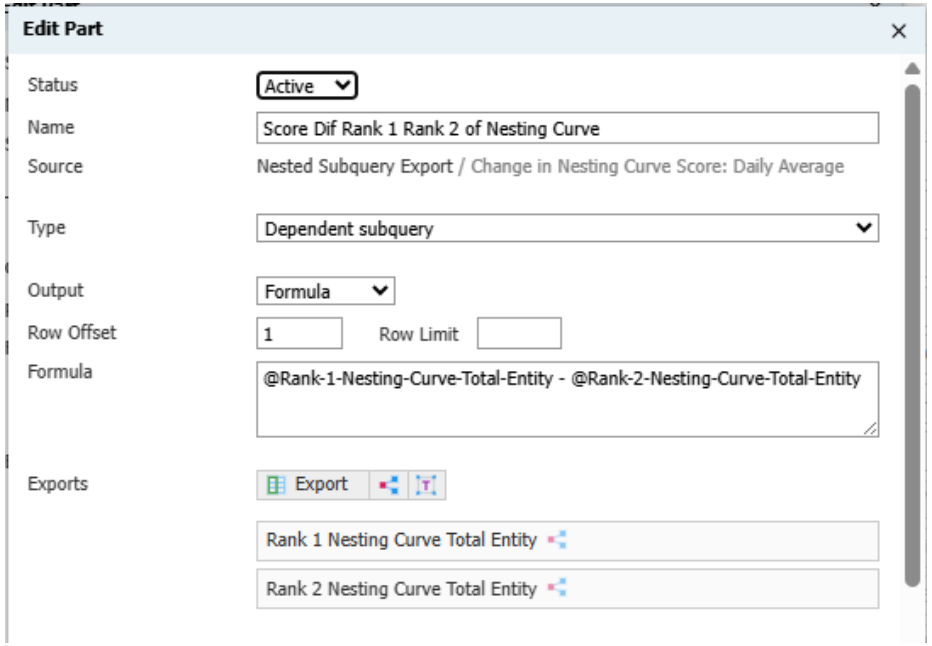
Dividing the point difference between the last 2 scores

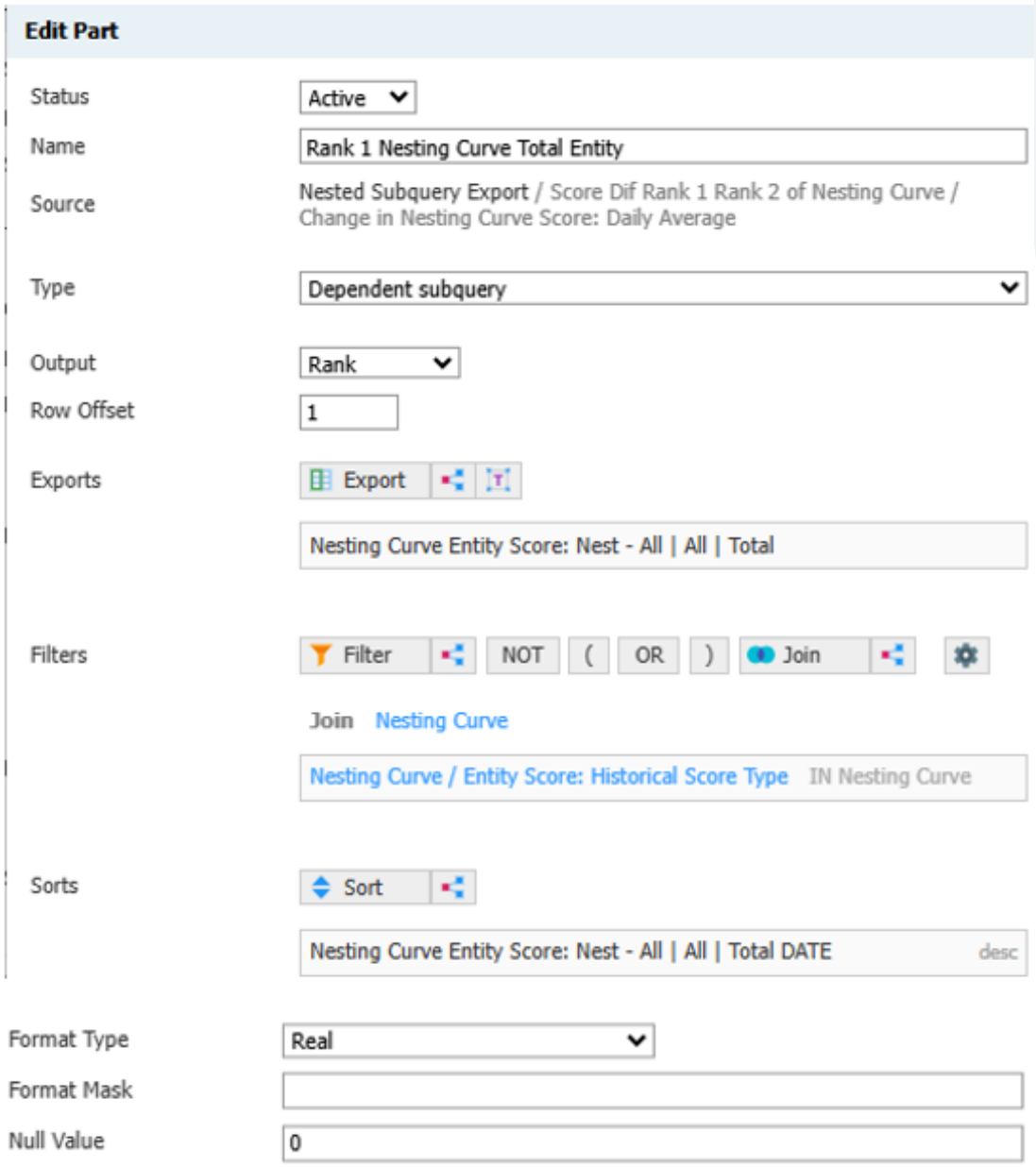
By the number of days between the run



Feature Engineering

Historical Tracking Entity and Daily Average Changes Subtracting Rank 2 from Rank 1 Score



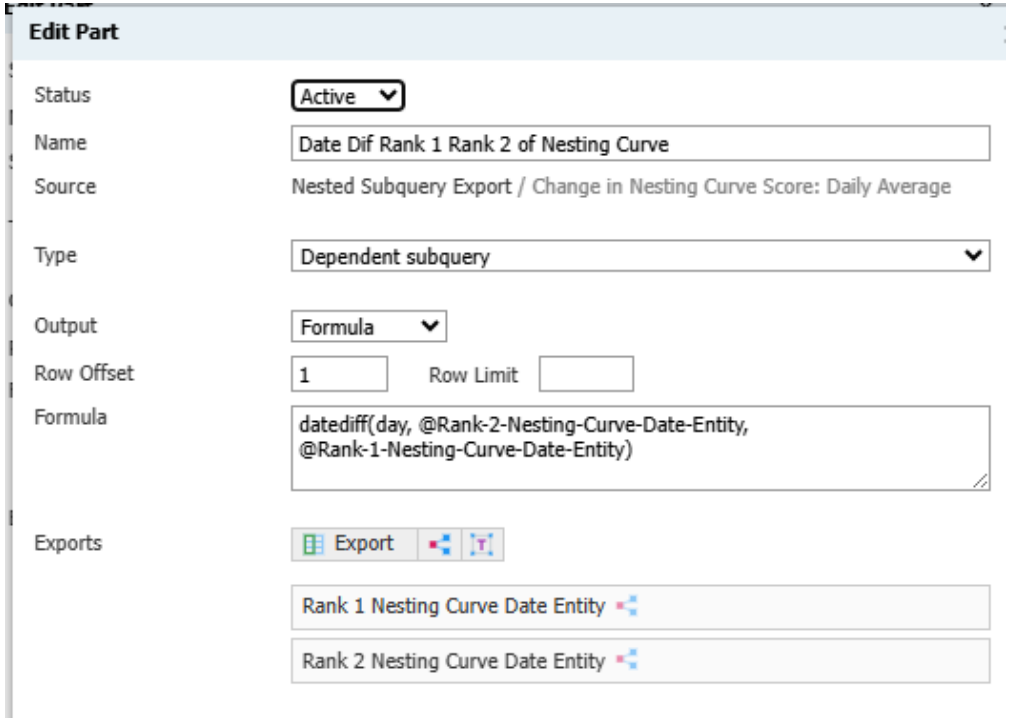


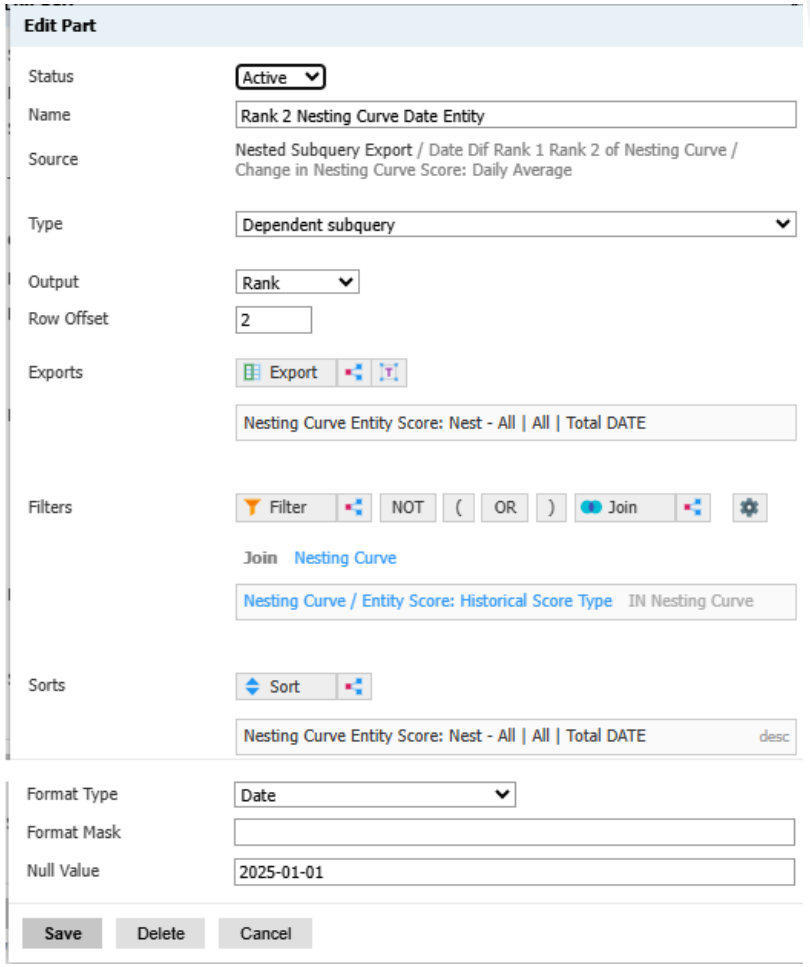
Feature Engineering

Historical Tracking Entity and Daily Average Changes

DateDiff to get number of days

Rank 1 & 2





Summary (Your Report Ghost Writer)

Flags and Counting Behaviors

Score Bands

Distance

Time-Anchored Behaviors

Streaks

Feature Engineering





Takeaways

With David

Takeaways

- **Build Smarter Exports:** Leverage flags, scores, and streaks to turn behaviors into structured insights. Ready for modeling, strategy, and action.
- **Think Like a Modeler:** Engineer features that explain, predict, or provoke questions. The goal isn’t just to describe, but to discover.
- **Anchor in Time:** Time-aware features (post-decision logins, pre-deadline actions) offer context that snapshot data can’t. Trends live in timelines.
- **Target Your Outreach:** Flags and counts help define micro-segments, those quietly engaged, those slipping away. Use them to personalize yield strategy.
- **Monitor Momentum:** Track behavior shifts and score deltas over time. Use historical comparisons to spot inflection points and act early.
- **Package the Power:** Channel your inner Wizard, Fixer, Architect, and Captain to automate and scale your insights. Feature Engineering isn’t just technical—it's transformational.



Suitcases and Resources

Suitcase

PDF (48 pages)

Powerpoint

2 Video Walkthroughs building Join, Filters, and Exports

