

**BCD3002**  
**Business Intelligence and Analytics**  
**(Winter Semester 2022-23)**  
**Digital Assignment**

**Name:** Disha Dutta

**Registration Number:** 20BDS0089

**Slot:** G1+TG1

**Date:** April 13<sup>th</sup>, 2023

Consider a problem with the following goal, main criteria, and sub criteria. Assume relative importance that is most appropriate to your personal experience when ranking the main criteria and sub criteria across various alternatives.

- a. Goal: To select the right university for pursuing your current academic program (**To pursue Master of Science in computer science**)
- b. Main criteria: Location, weather, cost of the program, reputation, student life, duration
- c. Sub criteria: Location = City Proximity, Part-Time Jobs, Full-Time Industry Proximity

**Weather = Hot, Cold, Snow**

**Cost of the program = Dollar Amount, Scholarship,  
Living Expenses**

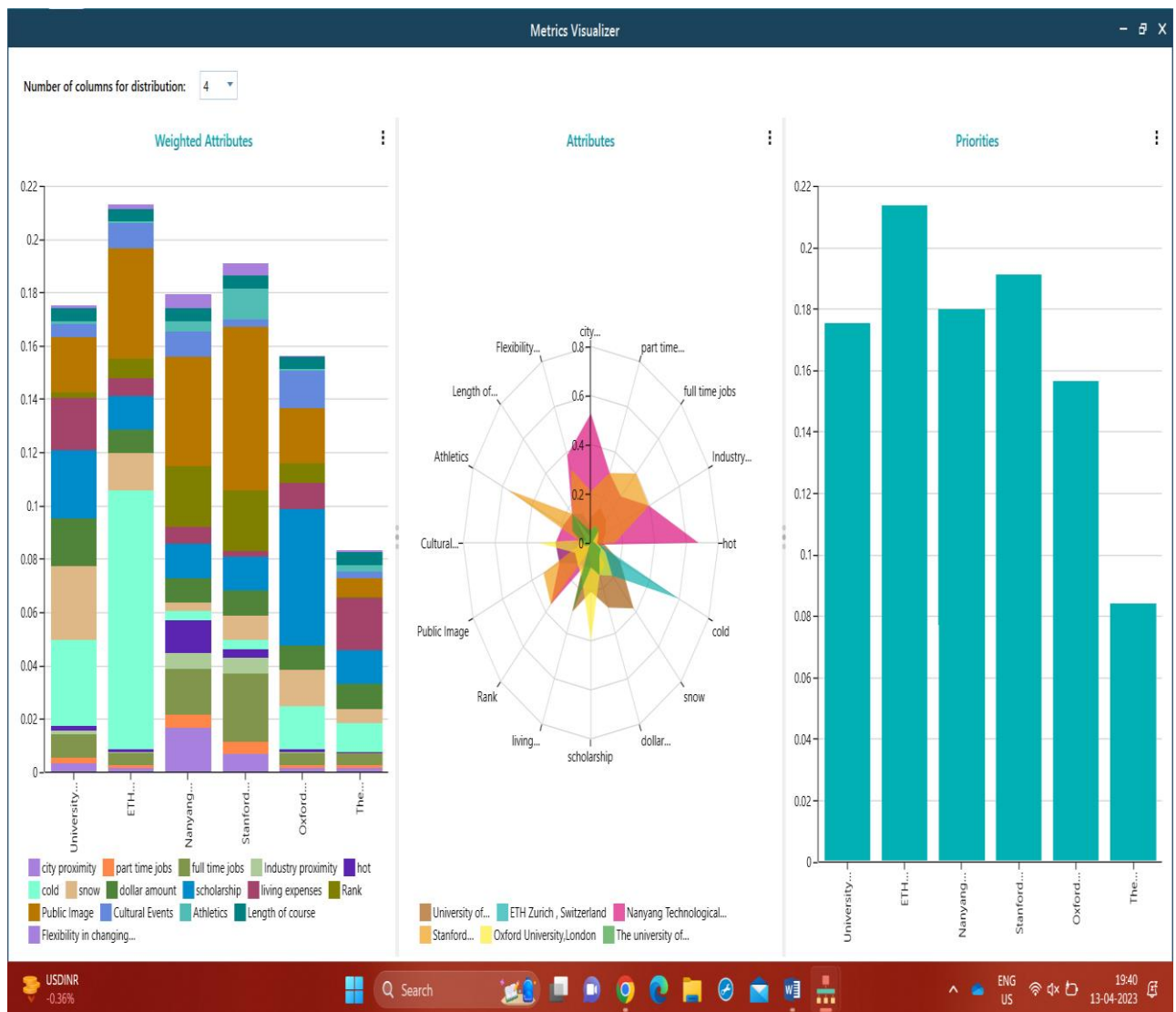
**Reputation = Rank, Public Image**

**Student life = Cultural Events, Athletics**

**Duration = Length of Course, Flexibility in Changing  
Duration**

**d. Choose various alternatives that you have  
considered. Solve the problem using the AHP  
methodology**

**( Nanyang Technological University, Singapore; ETH  
Zurich, Switzerland; Toronto University, Canada; Stanford  
University, California; Oxford University, London; The  
university of Sydney, Sydney)**



**Final Choice: ETH Zurich, Switzerland**

# Analytic Hierarchy Process - To select the right university for pursuing masters

## Recommendation



ETH Zurich , Switzerland

## Criteria



## Priority Trade-offs

\* Transitivity rule is enforced.

	Location	weather	cost of the program	reputation	student life	duration	Priorities
Location	1	0.5	0.5	0.5	2	3	0.128
weather	2	1	1	1	4	6	0.255
cost of the program	2	1	1	1	4	6	0.255
reputation	2	1	1	1	4	6	0.255
student life	0.5	0.25	0.25	0.25	1	1.5	0.064
duration	0.333	0.167	0.167	0.167	0.667	1	0.043

\* Consistency Ratio calculated as 0

Location 0.128	city proximity	part time jobs	full time jobs	Industry proximity	Priorities
city proximity	1	2	0.5	2	0.25
part time jobs	0.5	1	0.25	1	0.125
full time jobs	2	4	1	4	0.5
Industry proximity	0.5	1	0.25	1	0.125

\* Consistency Ratio calculated as 0

weather 0.255	hot	cold	snow	Priorities
hot	1	0.111	0.25	0.071
cold	9	1	2.25	0.643
snow	4	0.444	1	0.286

\* Consistency Ratio calculated as 0

cost of the program 0.255	dollar amount	scholarship	living expenses	Priorities
dollar amount	1	0.5	1	0.25
scholarship	2	1	2	0.5
living expenses	1	0.5	1	0.25

\* Consistency Ratio calculated as 0

reputation 0.255	Rank	Public Image	Priorities
Rank	1	0.333	0.25
Public Image	3	1	0.75

student life 0.064	Cultural Events	Athletics	Priorities
Cultural Events	1	2	0.667
Athletics	0.5	1	0.333

duration 0.043	Length of course	Flexibility in changing duration	Priorities
Length of course	1	2	0.667
Flexibility in changing duration	0.5	1	0.333

## Pairwise Comparisons of Options for Criteria

\* Transitivity rule is enforced.

## 'city proximity' from all Options

city proximity 0.25	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
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city proximity 0.25	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	2	0.2	0.5	2	2	0.105
ETH Zurich , Switzerland	0.5	1	0.1	0.25	1	1	0.053
Nanyang Technological University, Singapore	5	10	1	2.5	10	10	0.526
Stanford University, California	2	4	0.4	1	4	4	0.211
Oxford University, London	0.5	1	0.1	0.25	1	1	0.053
The university of sydney, sydney	0.5	1	0.1	0.25	1	1	0.053

\* Consistency Ratio calculated as 0

'part time jobs' from all Options

part time jobs 0.125	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	2	0.5	0.5	2	2	0.154
ETH Zurich , Switzerla nd	0.5	1	0.25	0.25	1	1	0.077
Nanyang Technolo gical Universit y,Singap ore	2	4	1	1	4	4	0.308
Stanford Universit y,Califor nia	2	4	1	1	4	4	0.308
Oxford Universit y,London	0.5	1	0.25	0.25	1	1	0.077
The universit y of sydney,s ydney	0.5	1	0.25	0.25	1	1	0.077

\* Consistency Ratio calculated as 0

## 'full time jobs' from all Options



full time jobs 0.5	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	2	0.5	0.333	2	2	0.133
ETH Zurich , Switzerland	0.5	1	0.25	0.167	1	1	0.067
Nanyang Technological University, Singapore	2	4	1	0.667	4	4	0.267
Stanford University, California	3	6	1.5	1	6	6	0.4
Oxford University, London	0.5	1	0.25	0.167	1	1	0.067
The university of sydney, sydney	0.5	1	0.25	0.167	1	1	0.067

\* Consistency Ratio calculated as 0

## 'Industry proximity' from all Options

Industry proximity 0.125	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	2	0.25	0.25	2	7	0.099
ETH Zurich , Switzerland	0.5	1	0.125	0.125	1	3.5	0.049
Nanyang Technological University, Singapore	4	8	1	1	8	28	0.394
Stanford University, California	4	8	1	1	8	28	0.394
Oxford University, London	0.5	1	0.125	0.125	1	3.5	0.049
The university of sydney, sydney	0.143	0.286	0.036	0.036	0.286	1	0.014

\* Consistency Ratio calculated as 0

'hot' from all Options

hot 0.071	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	2	0.111	0.5	2	3	0.075
ETH Zurich , Switzerla nd	0.5	1	0.056	0.25	1	1.5	0.038
Nanyang Technolo gical Universit y,Singap ore	9	18	1	4.5	18	27	0.675
Stanford Universit y,Califor nia	2	4	0.222	1	4	6	0.15
Oxford Universit y,London	0.5	1	0.056	0.25	1	1.5	0.038
The universit y of sydney,s ydney	0.333	0.667	0.037	0.167	0.667	1	0.025

\* Consistency Ratio calculated as 0

'cold' from all Options

cold 0.643	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	0.333	9	9	2	3	0.198
ETH Zurich , Switzerla nd	3	1	27	27	6	9	0.593
Nanyang Technolo gical Universit y,Singap ore	0.111	0.037	1	1	0.222	0.333	0.022
Stanford Universit y,Califor nia	0.111	0.037	1	1	0.222	0.333	0.022
Oxford Universit y,London	0.5	0.167	4.5	4.5	1	1.5	0.099
The universit y of sydney,s ydney	0.333	0.111	3	3	0.667	1	0.066

\* Consistency Ratio calculated as 0

'snow' from all Options

snow 0.286	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	2	9	3	2	5	0.378
ETH Zurich , Switzerla nd	0.5	1	4.5	1.5	1	2.5	0.189
Nanyang Technolo gical Universit y,Singap ore	0.111	0.222	1	0.333	0.222	0.556	0.042
Stanford Universit y,Califor nia	0.333	0.667	3	1	0.667	1.67	0.126
Oxford Universit y,London	0.5	1	4.5	1.5	1	2.5	0.189
The universit y of sydney,s ydney	0.2	0.4	1.8	0.6	0.4	1	0.076

\* Consistency Ratio calculated as 0

'dollar amount' from all Options

dollar amount 0.25	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	2	2	2	2	2	0.286
ETH Zurich , Switzerland	0.5	1	1	1	1	1	0.143
Nanyang Technological University, Singapore	0.5	1	1	1	1	1	0.143
Stanford University, California	0.5	1	1	1	1	1	0.143
Oxford University, London	0.5	1	1	1	1	1	0.143
The university of sydney, sydney	0.5	1	1	1	1	1	0.143

\* Consistency Ratio calculated as 0

'scholarship' from all Options

scholarship 0.5	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	2	2	2	0.5	2	0.2
ETH Zurich , Switzerland	0.5	1	1	1	0.25	1	0.1
Nanyang Technological University, Singapore	0.5	1	1	1	0.25	1	0.1
Stanford University, California	0.5	1	1	1	0.25	1	0.1
Oxford University, London	2	4	4	4	1	4	0.4
The university of sydney, sydney	0.5	1	1	1	0.25	1	0.1

\* Consistency Ratio calculated as 0

## 'living expenses' from all Options

living expense s 0.25	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	3	3	8	2	1	0.304
ETH Zurich , Switzerla nd	0.333	1	1	2.67	0.667	0.333	0.101
Nanyang Technolo gical Universit y,Singap ore	0.333	1	1	2.67	0.667	0.333	0.101
Stanford Universit y,Califor nia	0.125	0.375	0.375	1	0.25	0.125	0.038
Oxford Universit y,London	0.5	1.5	1.5	4	1	0.5	0.152
The universit y of sydney,s ydney	1	3	3	8	2	1	0.304

\* Consistency Ratio calculated as 0

## 'Rank' from all Options



Rank 0.25	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	0.333	0.111	0.111	0.333	3	0.039
ETH Zurich , Switzerla nd	3	1	0.333	0.333	1	9	0.118
Nanyang Technolo gical Universit y,Singap ore	9	3	1	1	3	27	0.355
Stanford Universit y,Califor nia	9	3	1	1	3	27	0.355
Oxford Universit y,London	3	1	0.333	0.333	1	9	0.118
The universit y of sydney,s ydney	0.333	0.111	0.037	0.037	0.111	1	0.013

\* Consistency Ratio calculated as 0

## 'Public Image' from all Options

Public Image 0.75	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University,Singapore	Stanford University,California	Oxford University,London	The university of sydney,sydney	Priorities
University of Toronto, Canada	1	0.5	0.5	0.333	1	3	0.107
ETH Zurich , Switzerland	2	1	1	0.667	2	6	0.214
Nanyang Technological University,Singapore	2	1	1	0.667	2	6	0.214
Stanford University,California	3	1.5	1.5	1	3	9	0.321
Oxford University,London	1	0.5	0.5	0.333	1	3	0.107
The university of sydney,sydney	0.333	0.167	0.167	0.111	0.333	1	0.036

\* Consistency Ratio calculated as 0

## 'Cultural Events' from all Options

Cultural Events 0.667	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	0.5	0.5	2	0.333	2	0.111
ETH Zurich , Switzerland	2	1	1	4	0.667	4	0.222
Nanyang Technological University, Singapore	2	1	1	4	0.667	4	0.222
Stanford University, California	0.5	0.25	0.25	1	0.167	1	0.056
Oxford University, London	3	1.5	1.5	6	1	6	0.333
The university of sydney, sydney	0.5	0.25	0.25	1	0.167	1	0.056

\* Consistency Ratio calculated as 0

## 'Athletics' from all Options

Athletics 0.333	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	2	0.333	0.111	2	0.5	0.062
ETH Zurich , Switzerla nd	0.5	1	0.167	0.056	1	0.25	0.031
Nanyang Technolo gical Universit y,Singap ore	3	6	1	0.333	6	1.5	0.188
Stanford Universit y,Califor nia	9	18	3	1	18	4.5	0.562
Oxford Universit y,London	0.5	1	0.167	0.056	1	0.25	0.031
The universit y of sydney,s ydney	2	4	0.667	0.222	4	1	0.125

\* Consistency Ratio calculated as 0

## 'Length of course' from all Options

Length of course 0.667	University of Toronto, Canada	ETH Zurich , Switzerland	Nanyang Technological University, Singapore	Stanford University, California	Oxford University, London	The university of sydney, sydney	Priorities
University of Toronto, Canada	1	1	1	1	1	1	0.167
ETH Zurich , Switzerland	1	1	1	1	1	1	0.167
Nanyang Technological University, Singapore	1	1	1	1	1	1	0.167
Stanford University, California	1	1	1	1	1	1	0.167
Oxford University, London	1	1	1	1	1	1	0.167
The university of sydney, sydney	1	1	1	1	1	1	0.167

\* Consistency Ratio calculated as 0

## 'Flexibility in changing duration' from all Options

Flexibility in changing duration 0.333	Universit y of Toronto, Canada	ETH Zurich , Switzerla nd	Nanyang Technolo gical Universit y,Singap ore	Stanford Universit y,Califor nia	Oxford Universit y,London	The universit y of sydney,s ydney	Priorities
Universit y of Toronto, Canada	1	0.5	0.167	0.2	2	1	0.065
ETH Zurich , Switzerla nd	2	1	0.333	0.4	4	2	0.129
Nanyang Technolo gical Universit y,Singap ore	6	3	1	1.2	12	6	0.387
Stanford Universit y,Califor nia	5	2.5	0.833	1	10	5	0.323
Oxford Universit y,London	0.5	0.25	0.083	0.1	1	0.5	0.032
The universit y of sydney,s ydney	1	0.5	0.167	0.2	2	1	0.065

\* Consistency Ratio calculated as 0

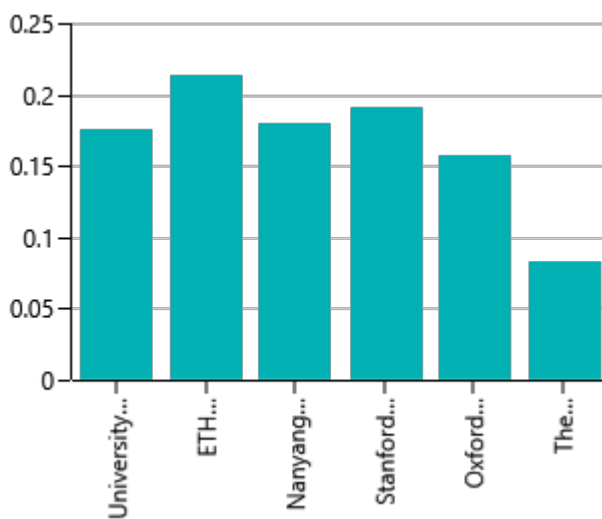
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Events] + 0.02 \* [Athletics] + 0.03 \* [Length of course] + 0.01 \* [Flexibility in changing duration]

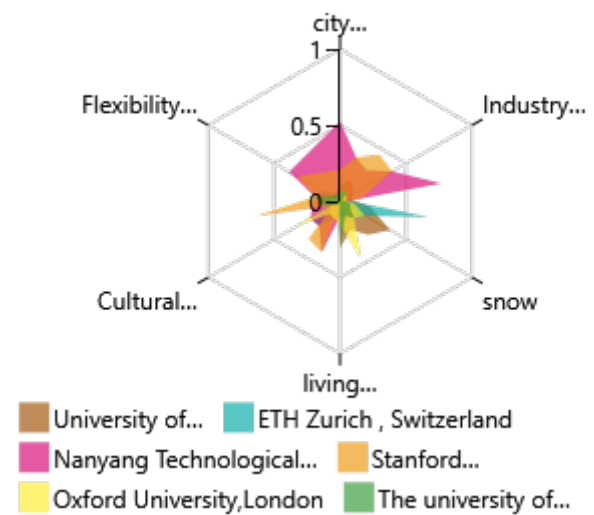
## Metrics

Option Name	Priorities
University of Toronto,Canada	0.175
ETH Zurich , Switzerland	0.213
Nanyang Technological University,Singapore	0.18
Stanford University,California	0.191
Oxford University,London	0.157
The university of sydney,sydney	0.084

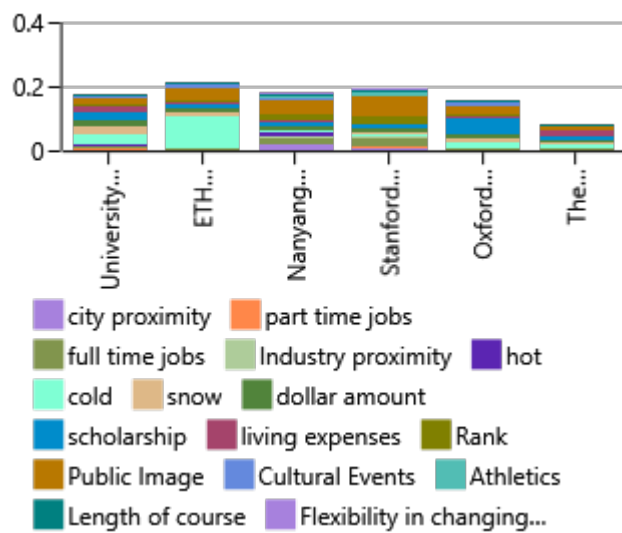
### Priorities



### Attributes

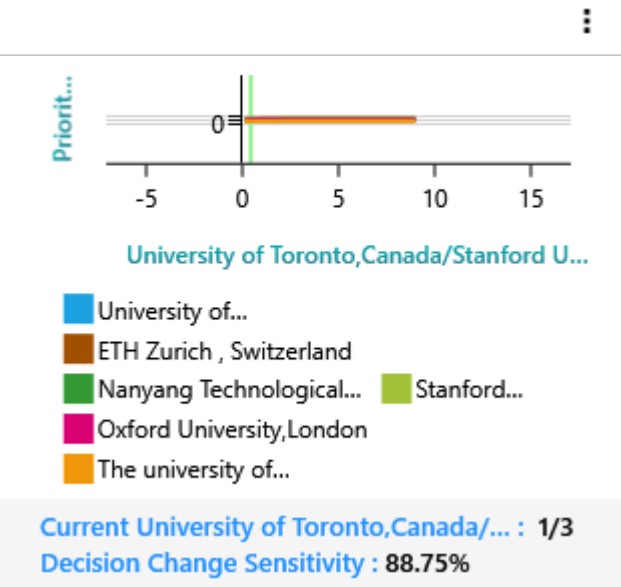


Weighted Attributes

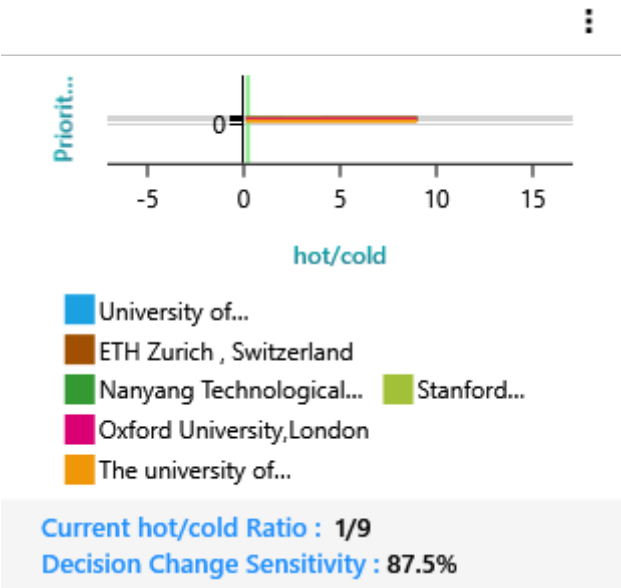


Sensitive Variables (26)

[Criterion : Public Image]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Stanford University,California]

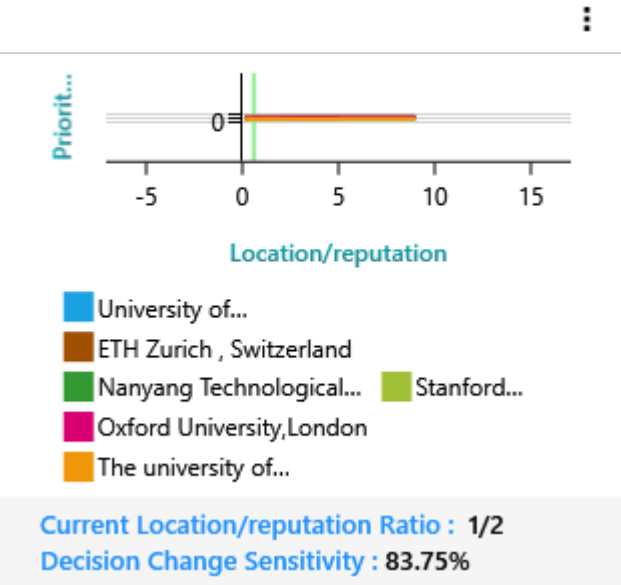


[Criterion : hot]→[Criterion Weight][Pair Comparison Against]→[Criterion : cold]

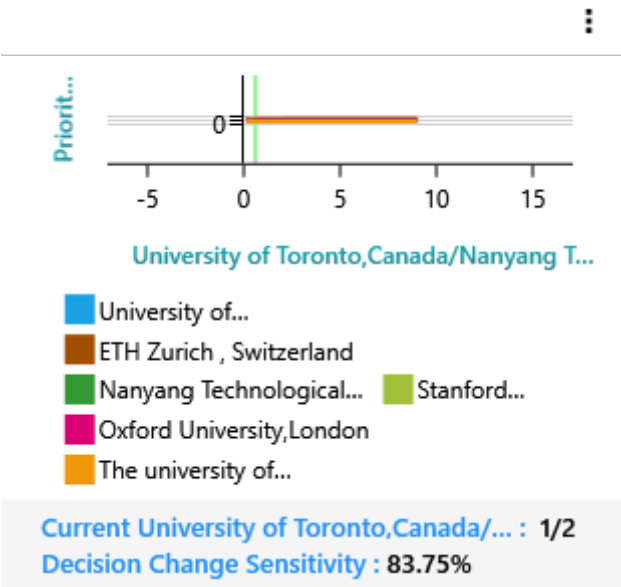




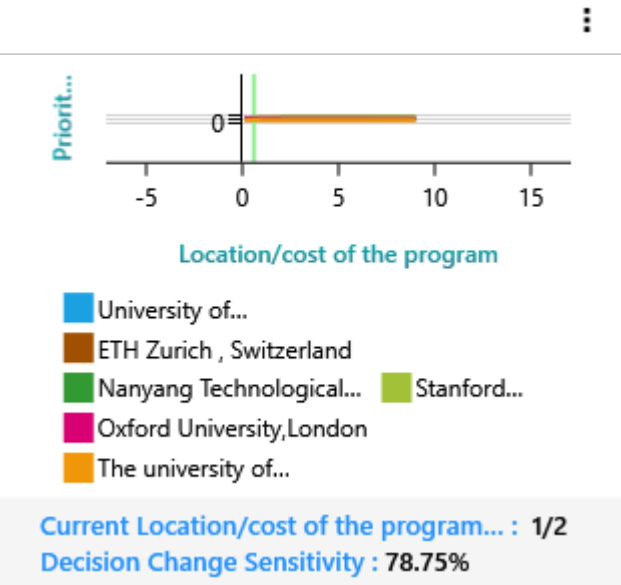
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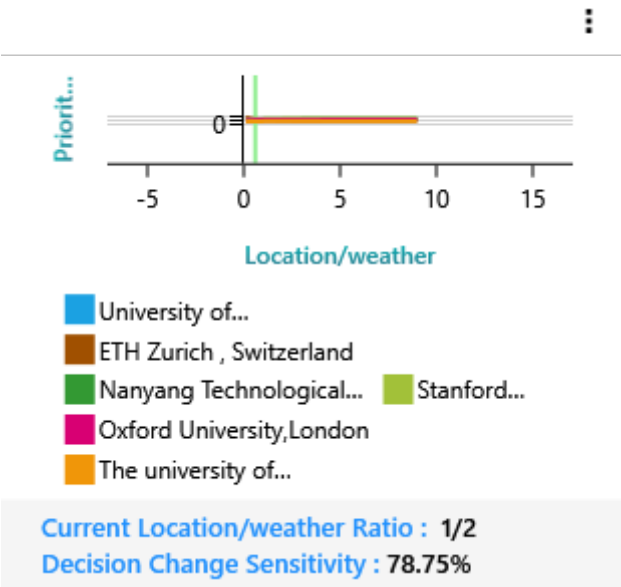
[Criterion : Public Image]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Nanyang Technological University,Singapore]



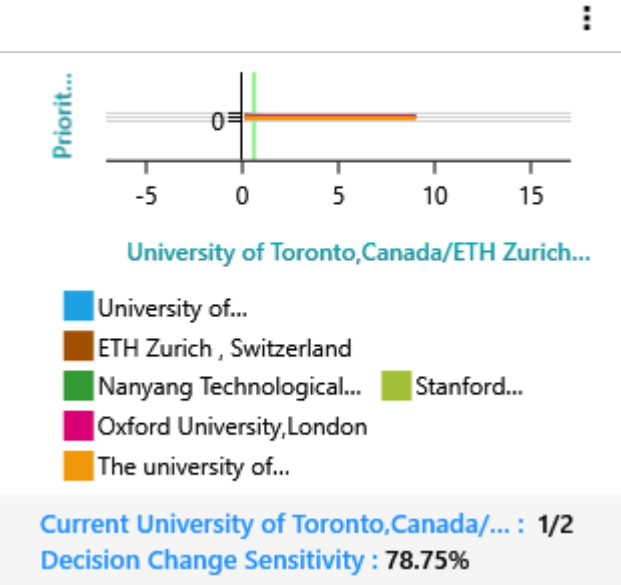
[Criterion : Location]→[Criterion Weight][Pair Comparison Against]→[Criterion : cost of the program]



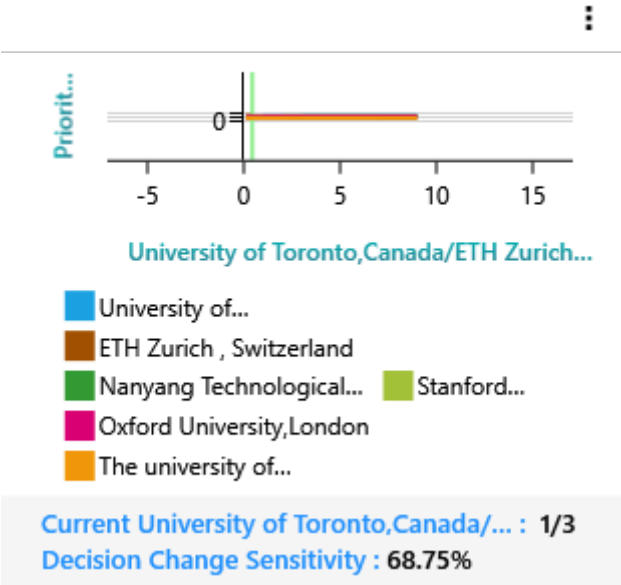
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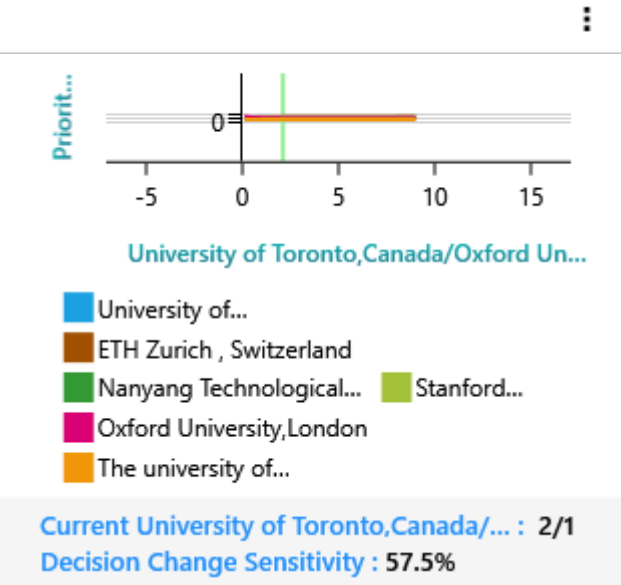
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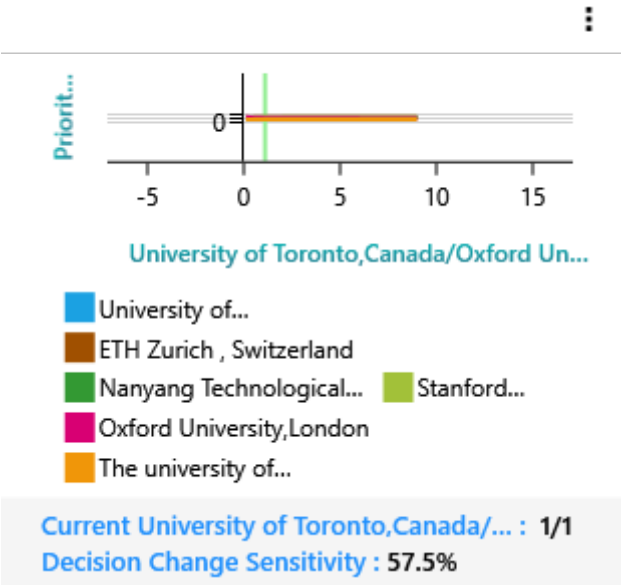
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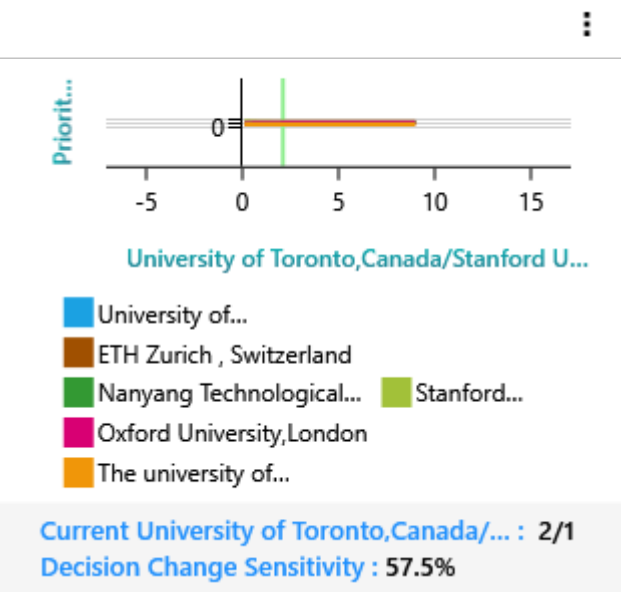
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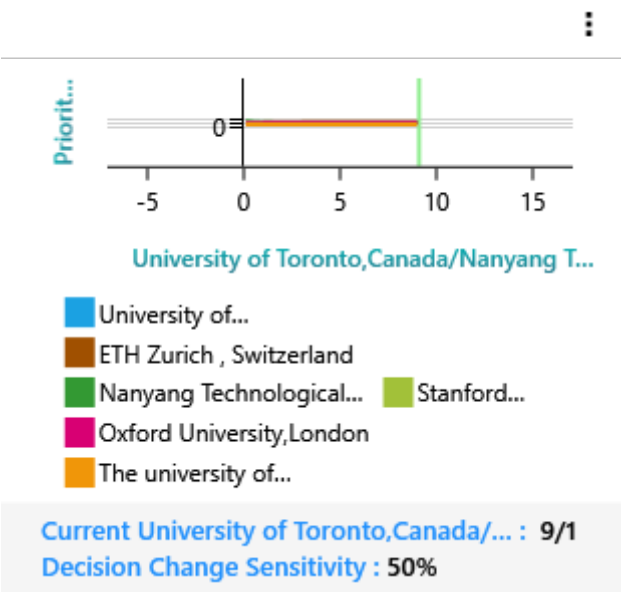
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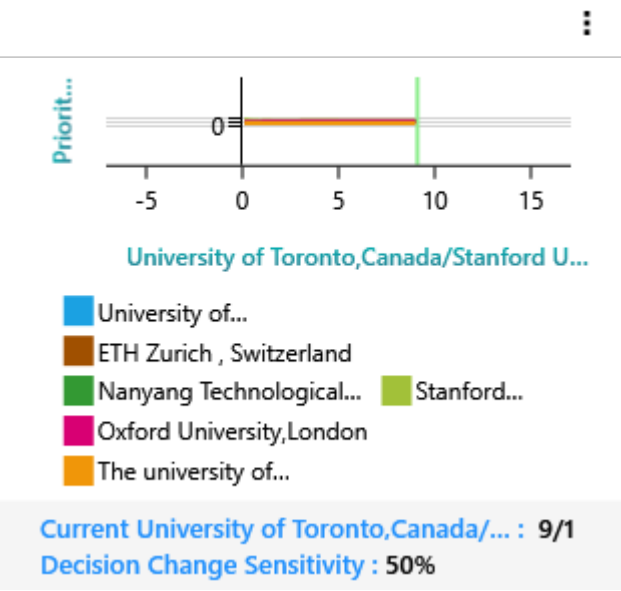
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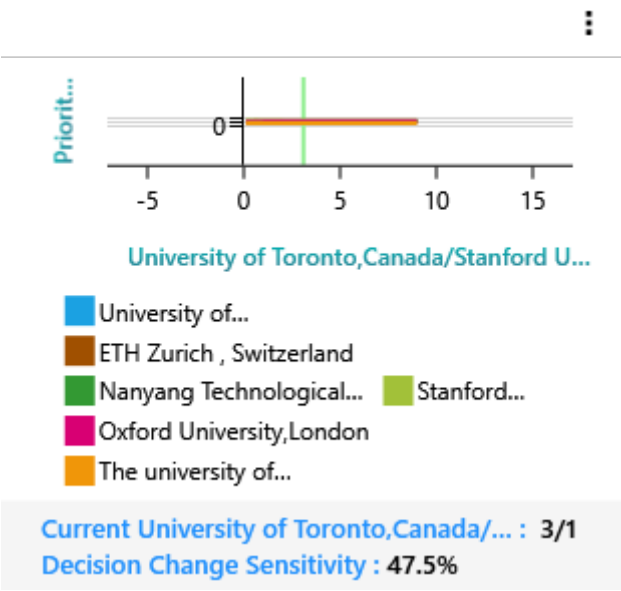
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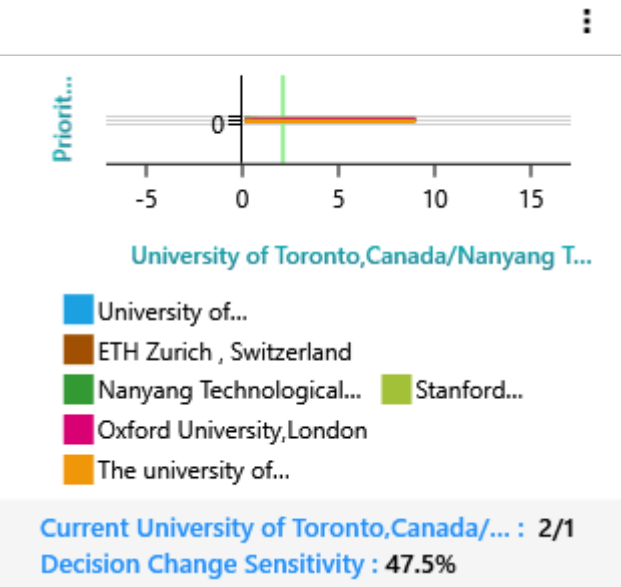
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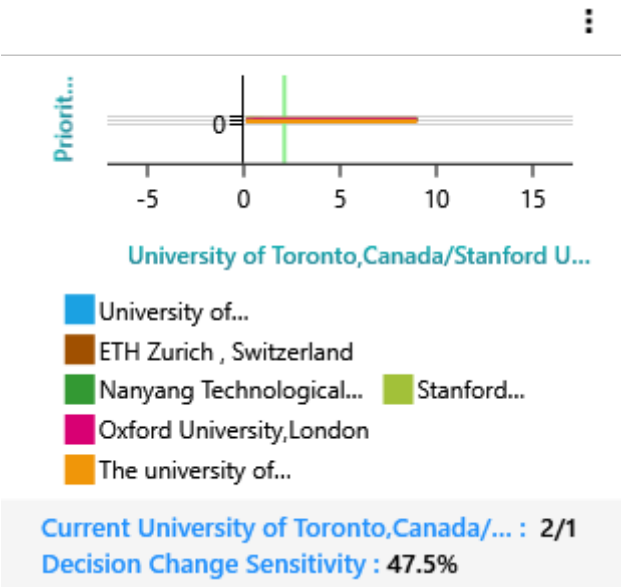
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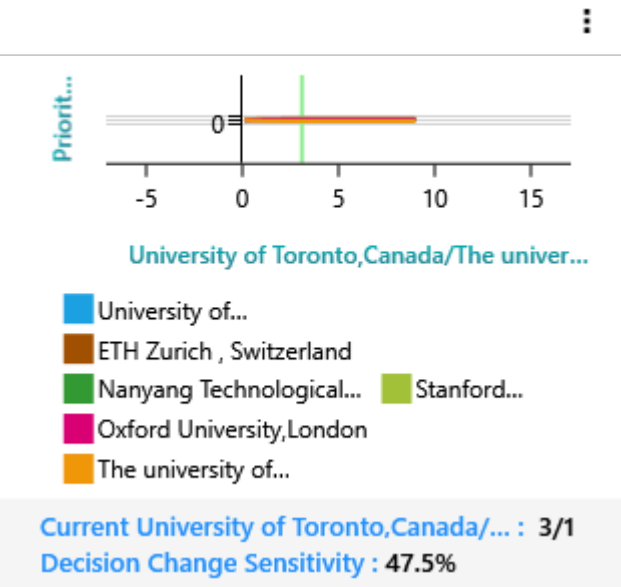
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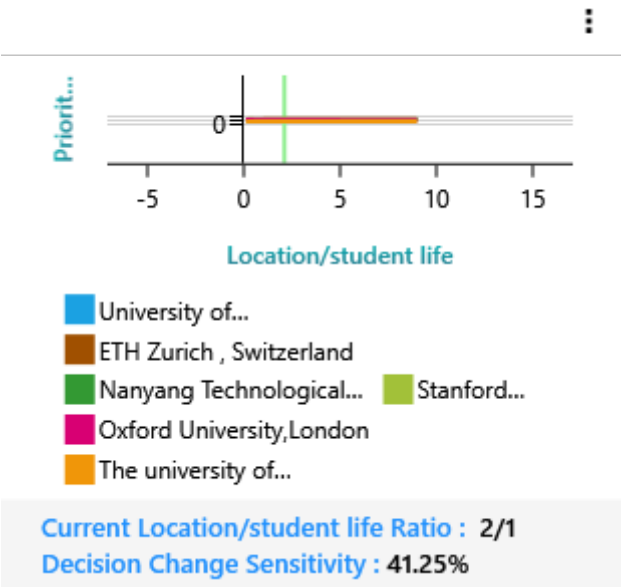
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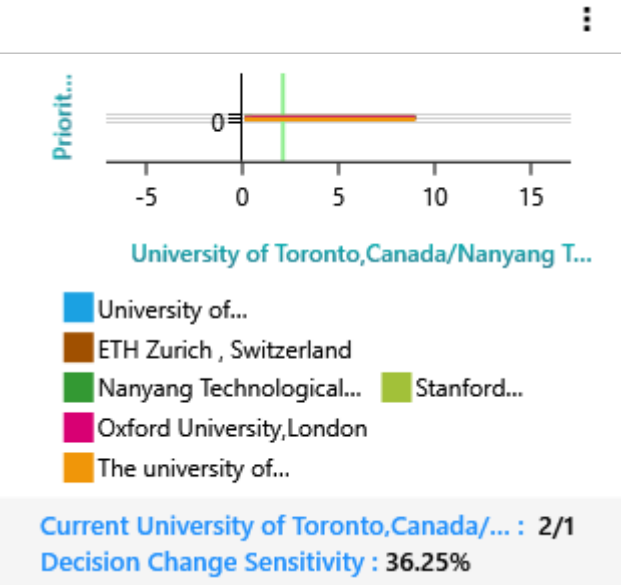
[Criterion : cold]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : The university of sydney,sydney]



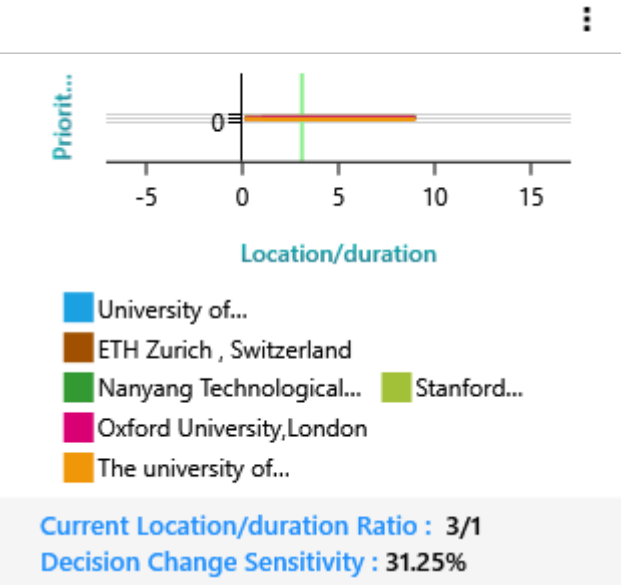
[Criterion : Location]→[Criterion Weight][Pair Comparison Against]→[Criterion : student life]



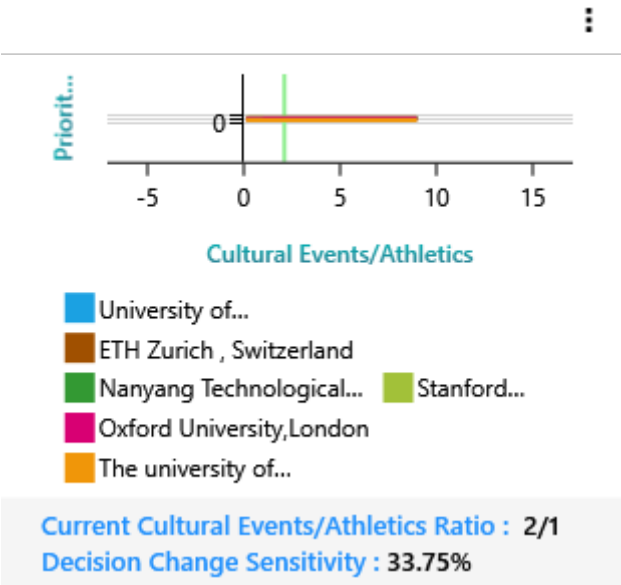
[Criterion : dollar amount]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Nanyang Technological University,Singapore]



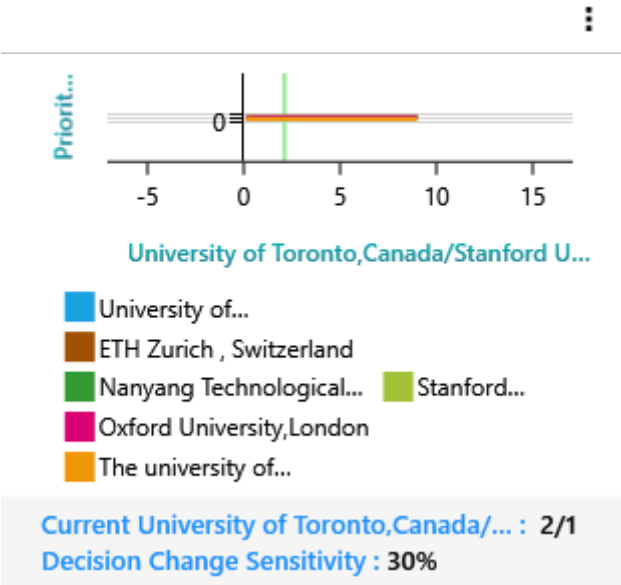
[Criterion : Location]→[Criterion Weight][Pair Comparison Against]→[Criterion : duration]



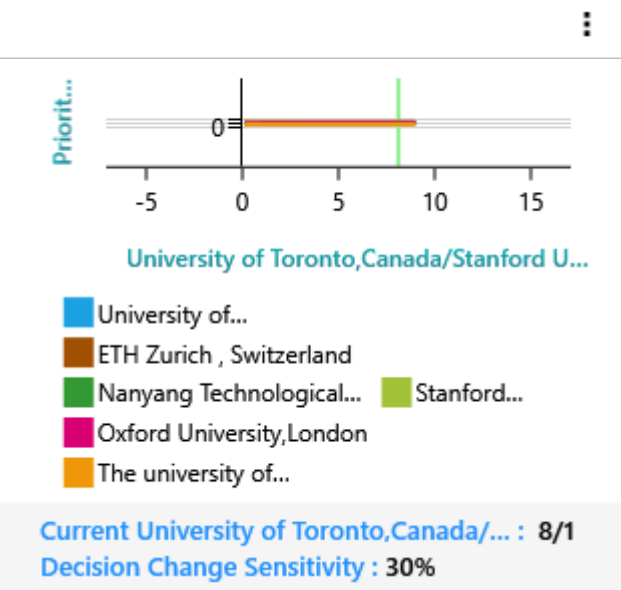
[Criterion : Cultural Events]→[Criterion Weight][Pair Comparison Against]→[Criterion : Athletics]



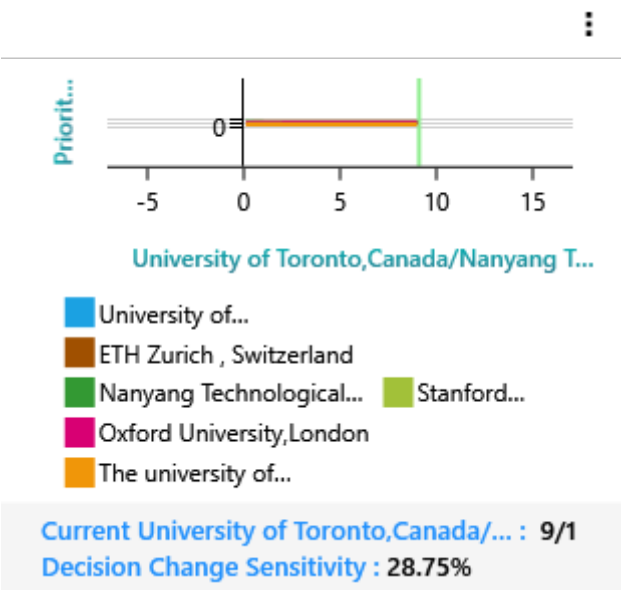
[Criterion : Cultural Events]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Stanford University,California]



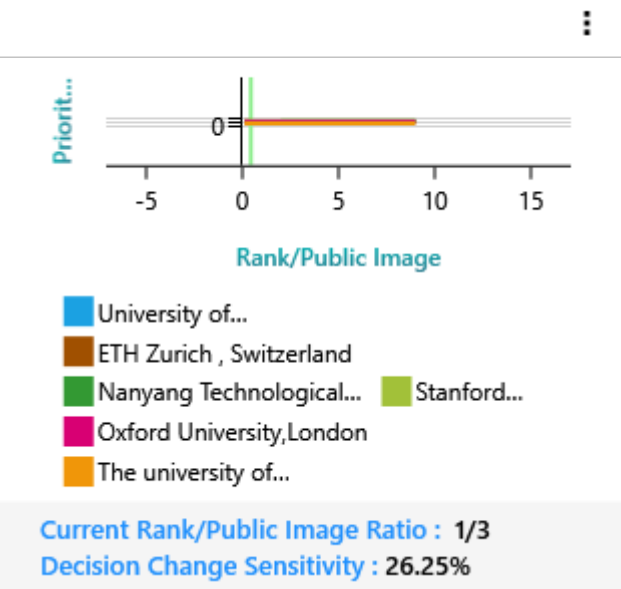
[Criterion : living expenses]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Stanford University,California]



[Criterion : snow]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Nanyang Technological University,Singapore]



[Criterion : Rank]→[Criterion Weight][Pair Comparison Against]→[Criterion : Public Image]



[Criterion : living expenses]→[Option : University of Toronto,Canada]→[Value][Pair Comparison Against]→[Option : Nanyang Technological University,Singapore]

