

Attribute Query Rules

Rule	Concept	Attribute	Filter	Aggregation	Logical Form	Examples
attribute query aggregate attribute query duration query cost query activity query activity duration query activity cost query resource query resource duration query resource cost query	event activity resource	any event attribute	*any event attribute	**any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2 **aggregate <u>aggregation</u> #3	What is the maximum lead time of the process? How long does the process execution take? What is the duration of activity X? How much does X cost in average? How much time does Mary Johnson usually take to complete her tasks?
	case variant process	any case attribute	*any case attribute	**any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2 **aggregate <u>aggregation</u> #3	
		any numerical event attribute	*any event attribute	**any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project case #2 project <u>attribute</u> #2 group sum #4 #3 **aggregate <u>aggregation</u> #5	
all attribute query	event	any event attribute	*any event attribute	-	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2	What is the cost of each case? Show me the mean duration of every activity in the process?
	case	any case attribute	*any case attribute	-	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2	
		any numerical event attribute	*any event attribute	-	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project case #2 project <u>attribute</u> #2 group sum #4 #3	
	activity resource	any event attribute	*any event attribute	-	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>concept-1</u> #2 project <u>attribute</u> #2 group average #4 #3	
				any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>concept-1</u> #2 project <u>attribute</u> #2 group <u>aggregation</u> #4 #3	
	variant	any case attribute	*any case attribute	-	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 project <u>attribute</u> #2 group average #4 #3	
				any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 project <u>attribute</u> #2 group <u>aggregation</u> #4 #3	
	no-concept attribute query	-	any case attribute	*any case attribute	**any	
-		any numerical event attribute	*any event attribute	**any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project case #2 project <u>attribute</u> #2 group sum #4 #3 **aggregate <u>aggregation</u> #5	
-		any non- numerical event attribute	*any event attribute	**any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2 **aggregate <u>aggregation</u> #3	

Instance Query Rules

Rule	Concept-1	Concept-2	Filter	Superlative	Negation	Logical Form	Examples
concept query	event	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1	Show me all cases that are in progress What are the process variants?
	case	-	*any case attribute	-	-	select case *filter filter-attr filter-value #1	
	activity resource	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1 project distinct concept-1 #2	
	variant	-	*any case attribute	-	-	select case *filter filter-attr filter-value #1 project distinct trace #2	
compound concept query	event	case activity resource	*any event attribute	-	-	select event *filter filter-attr filter-value #1 project concept-2 #2 group list #2 #3	What are the cases following each path? List the activities executed by each case. What are the tasks usually assigned to each resource? Show me the resources that work on each activity.
	case	variant	*any case attribute	-	-	select case *filter filter-attr filter-value #1 project trace #2 group list #2 #3	
	case activity resource	case activity resource	*any event attribute	-	-	select event *filter filter-attr filter-value #1 project distinct concept-1 #2 project concept-2 #2 group list #3 #4	
	activity	variant	*any case attribute	-	-	select case *filter filter-attr filter-value #1 project distinct trace #2	
concept activity execution query resource activity execution query	event	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter activity activity #2 **discard #2 #3	What cases execute activity X? What are the process instances that do not run task X? Show me the paths that pass through X the most. What employees usually work on task X? Who is mostly assigned to activity X?
	case resource	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter activity activity #2 project distinct concept-1 #3 **project distinct concept-1 #2 **discard #5 #4	
				any	-	select event *filter filter-attr filter-value #1 filter activity activity #2 project concept-1 #3 group count #3 #4 superlative superlative #4 #5	
	variant	-	*any case attribute	-	**any	select case *filter filter-attr filter-value #1 project distinct trace #2 predicate occurs activity #3 **discard #3 #4	
				any	-	select case *filter filter-attr filter-value #1 project distinct trace #2 predicate num-occurrences activity #3 superlative superlative #3 #4	
	event	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter resource resource #2 **discard #2 #3	
concept resource assignment query	case	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter resource resource #2 project distinct case #3 **project distinct case #2 **discard #5 #4	
	activity	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter resource resource #2 project distinct activity #3 **project distinct activity #2 **discard #5 #4	
				any	-	select event *filter filter-attr filter-value #1 filter resource resource #2 project activity #3 group count #3 #4 superlative superlative #4 #5	
	variant	-	*any case attribute	-	**any	select event filter resource resource #1 project distinct case #2 select case *filter filter-attr filter-value #4 filter case-id #3 #5 project distinct trace #6 **project distinct trace #5 **discard #8 #7	
any				-	select event filter resource resource #1 project distinct case #2 select case *filter filter-attr filter-value #4 filter case-id #3 #5 project trace #6 group count #6 #7 superlative superlative #7 #8		

Count Query Rules

Rule	Concept-1	Concept-2	Filter	Aggregation	Negation	Logical Form	Examples
total count query length query	event	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1 aggregate count #2	How many process instances are there? What is the total number of events? How many variants are there?
	case	-	*any case attribute	-	-	select case *filter filter-attr filter-value #1 aggregate count #2	
	activity resource	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1 project distinct concept-1 #2 aggregate count #3	
	variant	-	*any case attribute	-	-	select case *filter filter-attr filter-value #1 project distinct trace #2 aggregate count #3	
execution count query	activity resource	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1 project concept-1 #2 group count #2 #3	How many times is each activity performed? What is the number of times each variant was executed?
	variant	-	*any case attribute	-	-	select case *filter filter-attr filter-value #1 project trace #2 group count #2 #3	
count query aggregate count query length query	event	case	*any event attribute	**any	-	select event *filter filter-attr filter-value #1 project case #2 group count #2 #3 **aggregate aggregation #4	What is the number of events for each process instance? How many cases follow each variant? How many people work on a case, in average?
	case	variant	*any case attribute	**any	-	select case *filter filter-attr filter-value #1 project trace #2 group count #2 #3 **aggregate aggregation #4	
	case activity resource	case activity resource	*any event attribute	**any	-	select event *filter filter-attr filter-value #1 project distinct concept-1 #2 project concept-2 #2 group count #3 #4 **aggregate aggregation #5	
	event	activity resource	*any event attribute	**any	-	select event *filter filter-attr filter-value #1 project concept-2 group count #2 #3 **aggregate aggregation #4	
	activity	variant	*any case attribute	**any	-	select case *filter filter-attr filter-value #1 project trace #2 predicate num-distinct-activities #3 **aggregate aggregation #4	
concept activity execution count query	event	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter activity activity #2 **discard #2 #3 aggregate count #4	How many cases do not execute activity X? What is the number of variants that run through X? How many different people perform activity X?
	case resource	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter activity activity #2 project distinct concept-1 #3 **project distinct concept-1 #2 **discard #5 #4 aggregate count #6	
	variant	-	*any case attribute	-	**any	select case *filter filter-attr filter-value #1 project trace #2 predicate occurs activity #3 **discard #3 #4 aggregate count #5	
total activity execution count query	-	-	*any event attribute	-	-	select event *filter filter-attr filter-value #1 filter activity activity #2 aggregate count #3	How many times is X executed?
activity execution count query	case resource	-	*any event attribute	**any	-	select event *filter filter-attr filter-value #1 filter activity activity #2 project concept-1 #3 group count #3 #4 **aggregate aggregation #5	How many times is activity X executed by each case? What is the average number of times process instances execute X?
	variant	-	*any case attribute	**any	-	select case *filter filter-attr filter-value #1 project distinct trace #2 predicate num-occurrences activity #3 **aggregate aggregation #4	
resource assignment count query	event	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter resource resource #2 **discard #2 #3 aggregate count #4	How many cases did Mary Johnson work on?
	case activity	-	*any event attribute	-	**any	select event *filter filter-attr filter-value #1 filter resource resource #2 project distinct concept-1 #3 **project distinct concept-1 #2 **discard #5 #4 aggregate count #6	
	variant	-	*any case attribute	-	**any	select event filter resource resource #1 project distinct case #2 select case *filter filter-attr filter-value #4 filter case-id #3 #5 project distinct trace #6 **project distinct trace #5 **discard #8 #7 aggregate count #9	

Superlative Query Rules

Rule	Concept-1	Concept-2	Attribute	Filter	Superlative	Logical Form	Examples
argument query duration argument query cost argument query reverse cost argument query	event	-	any event attribute	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2 superlative <u>superlative</u> #2 #3	Which case had the longest duration? What are the 10 fastest cases? What task has the highest average cost? Show the 5% most expensive cases. What is the cheapest activity in the process?
	case	-	any case attribute	*any case attribute	any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>attribute</u> #2 superlative <u>superlative</u> #2 #3	
			any numerical event attribute	*any event attribute		select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project case #2 project <u>attribute</u> #2 group sum #4 #3 superlative <u>superlative</u> #3 #5	
	activity resource	-	any event attribute	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>concept-1</u> #2 project <u>attribute</u> #2 group average #4 #3 superlative <u>superlative</u> #3 #5	
	variant	-	any case attribute	*any event attribute	any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 project <u>attribute</u> #2 group average #4 #3 superlative <u>superlative</u> #3 #5	
count argument query	event	case	-	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project case #2 group count #2 #3 superlative <u>superlative</u> #3 #4	Which activity is executed by the most cases? Which 3 resources have worked on the least cases? What variant passes through the most activities?
	case	variant	-	*any case attribute	any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 group count #2 #3 superlative <u>superlative</u> #3 #4	
	case activity resource	case activity resource	-	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project distinct <u>concept-1</u> #2 project <u>concept-2</u> #2 group count #3 #4 superlative <u>superlative</u> #4 #5	
	event	activity resource	-	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>concept-2</u> group count #2 #3 superlative <u>superlative</u> #3 #4	
	activity	variant	-	*any case attribute	any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 predicate num-distinct-activities #3 superlative <u>superlative</u> #3 #4	
execution count argument query inexecution count argument query main argument query	activity resource	-	-	*any event attribute	any	select event *filter <u>filter-attr</u> <u>filter-value</u> #1 project <u>concept-1</u> #2 group count #2 #3 superlative <u>superlative</u> #3 #4	What is the 3 most executed tasks? What resource is accessed the least? Who are the 5% of the resources with the most assignments? Which is the rarest variant? What is the main path in the process?
	variant	-	-	*any case attribute	any	select case *filter <u>filter-attr</u> <u>filter-value</u> #1 project trace #2 group count #2 #3 superlative <u>superlative</u> #3 #4	