

IS 1  
IS 2  
IS 3  
IS 4  
IS 5  
IS 6  
IS 7

Interactive / short / 1

query	Interactive / short / 1																																												
title	Profile of a person																																												
pattern	<div><div>person: Person</div><div>id lastName birthday ipAddress browser</div></div> <div>→ isLocatedIn →</div> <div>city: City</div> <div>id</div>																																												
desc.	Given a start Person, retrieve their first name, last name, birthday, IP address, browser, and city of residence.																																												
params	<div><div>1</div><div>Person.id</div><div>ID</div><div>personId</div></div>																																												
result	<table><tr><td>1</td><td>Person.firstName</td><td>String</td><td>R</td><td>firstName</td></tr><tr><td>2</td><td>Person.lastName</td><td>String</td><td>R</td><td>lastName</td></tr><tr><td>3</td><td>Person.birthday</td><td>Date</td><td>R</td><td>birthday</td></tr><tr><td>4</td><td>Person.locationIP</td><td>String</td><td>R</td><td>locationIP</td></tr><tr><td>5</td><td>Person.browserUsed</td><td>String</td><td>R</td><td>browserUsed</td></tr><tr><td>6</td><td>Person-isLocatedIn-&gt;City.id</td><td>32-bit Integer</td><td>R</td><td>cityId</td></tr><tr><td>7</td><td>Person.gender</td><td>String</td><td>R</td><td>gender</td></tr><tr><td>8</td><td>Person.creationDate</td><td>DateTime</td><td>R</td><td>creationDate</td></tr></table>					1	Person.firstName	String	R	firstName	2	Person.lastName	String	R	lastName	3	Person.birthday	Date	R	birthday	4	Person.locationIP	String	R	locationIP	5	Person.browserUsed	String	R	browserUsed	6	Person-isLocatedIn->City.id	32-bit Integer	R	cityId	7	Person.gender	String	R	gender	8	Person.creationDate	DateTime	R	creationDate
1	Person.firstName	String	R	firstName																																									
2	Person.lastName	String	R	lastName																																									
3	Person.birthday	Date	R	birthday																																									
4	Person.locationIP	String	R	locationIP																																									
5	Person.browserUsed	String	R	browserUsed																																									
6	Person-isLocatedIn->City.id	32-bit Integer	R	cityId																																									
7	Person.gender	String	R	gender																																									
8	Person.creationDate	DateTime	R	creationDate																																									

## Interactive / short / 2

IS 1  
IS 2  
IS 3  
IS 4  
IS 5  
IS 6  
IS 7

query	Interactive / short / 2																																						
title	Recent messages of a person																																						
pattern	<pre> graph TD     person[person: Person] -- hasCreator --&gt; Message[Message]     Message -- "replyOf*1.." --&gt; Post[Post]     Post -- hasCreator --&gt; op_person[op: Person]     </pre> <p>person: Person attributes: id, lastName, birthday, ipAddress, browser</p> <p>Message attributes: id, lastName, birthday, ipAddress, browser, content/imageFile</p> <p>Post attributes: (not explicitly listed)</p>																																						
desc.	Given a start Person, retrieve the last 10 Messages created by that user. For each Message, return that Message, the original Post in its conversation, and the author of that Post. If any of the Messages is a Post, then the original Post will be the same Message, i.e. that Message will appear twice in that result.																																						
params	<div>1 Person.id ID personId</div>																																						
result	<table> <tr> <td>1</td><td>Message.id</td><td>64-bit Integer</td><td>R</td><td>messageId</td></tr> <tr> <td>2</td><td>Message.content or Post.imageFile</td><td>String</td><td>R</td><td>messageContent</td></tr> <tr> <td>3</td><td>Message.creationDate</td><td>DateTime</td><td>R</td><td>messageCreationDate</td></tr> <tr> <td>4</td><td>Post.id or Comment-replyOf*-&gt;Post.id</td><td>ID</td><td>R</td><td>originalPostId</td></tr> <tr> <td>5</td><td>Post-hasCreator-&gt;Person.id or Comment-replyOf*-&gt;Post-hasCreator-&gt;Person.id</td><td>ID</td><td>R</td><td>originalPostAuthorId</td></tr> <tr> <td>6</td><td>Post-hasCreator-&gt;Person.firstName or Comment-replyOf*-&gt;Post-hasCreator-&gt;Person.firstName</td><td>String</td><td>R</td><td>originalPostAuthorFirst•Name</td></tr> <tr> <td>7</td><td>Post-hasCreator-&gt;Person.lastName or Comment-replyOf*-&gt;Post-hasCreator-&gt;Person.lastName</td><td>String</td><td>R</td><td>originalPostAuthorLast•Name</td></tr> </table>				1	Message.id	64-bit Integer	R	messageId	2	Message.content or Post.imageFile	String	R	messageContent	3	Message.creationDate	DateTime	R	messageCreationDate	4	Post.id or Comment-replyOf*->Post.id	ID	R	originalPostId	5	Post-hasCreator->Person.id or Comment-replyOf*->Post-hasCreator->Person.id	ID	R	originalPostAuthorId	6	Post-hasCreator->Person.firstName or Comment-replyOf*->Post-hasCreator->Person.firstName	String	R	originalPostAuthorFirst•Name	7	Post-hasCreator->Person.lastName or Comment-replyOf*->Post-hasCreator->Person.lastName	String	R	originalPostAuthorLast•Name
1	Message.id	64-bit Integer	R	messageId																																			
2	Message.content or Post.imageFile	String	R	messageContent																																			
3	Message.creationDate	DateTime	R	messageCreationDate																																			
4	Post.id or Comment-replyOf*->Post.id	ID	R	originalPostId																																			
5	Post-hasCreator->Person.id or Comment-replyOf*->Post-hasCreator->Person.id	ID	R	originalPostAuthorId																																			
6	Post-hasCreator->Person.firstName or Comment-replyOf*->Post-hasCreator->Person.firstName	String	R	originalPostAuthorFirst•Name																																			
7	Post-hasCreator->Person.lastName or Comment-replyOf*->Post-hasCreator->Person.lastName	String	R	originalPostAuthorLast•Name																																			
sort	<div>1 Message.creationDate ↓</div> <div>2 Message.id ↓</div>																																						

### Interactive / short / 3

IS 1	query	Interactive / short / 3				
IS 2	title	Friends of a person				
IS 3	pattern	<div><div>Person</div><div><div>id = \$id</div></div></div> <div>— knows —</div> <div>creationDate</div> <div><div>person: Person</div><div><div>id</div><div>firstName</div><div>lastName</div></div></div>				
IS 4						
IS 5						
IS 6						
IS 7	desc.	Given a start Person, retrieve all of their friends, and the date at which they became friends.				
	params	<div><div>1</div><div>Person.id</div><div>ID</div><div>personId</div></div>				
	result	<div><div>1</div><div>Person.id</div><div>ID</div><div>R</div><div>personId</div></div>				
		<div><div>2</div><div>Person.firstName</div><div>String</div><div>R</div><div>firstName</div></div>				
		<div><div>3</div><div>Person.lastName</div><div>String</div><div>R</div><div>lastName</div></div>				
		<div><div>4</div><div>Knows.creationDate</div><div>DateTime</div><div>R</div><div>friendshipCreationDate</div></div>				
	sort	<div><div>1</div><div>Knows.creationDate</div><div>↓</div><div></div></div>				
		<div><div>2</div><div>Person.id</div><div>↑</div><div></div></div>				

### Interactive / short / 4

IS 1	query	Interactive / short / 4				
IS 2	title	Content of a message				
IS 3	pattern	<div><div>Message</div><div>content or Post.imageFile creationDate</div></div>				
IS 4						
IS 5						
IS 6	desc.	Given a Message, retrieve its content and creation date.				
IS 7	params					
		<div><div>1</div><div>Message.id</div><div>ID</div><div>messageId</div></div>				
	result					
		<div><div>1</div><div>Message.creationDate</div><div>ID</div><div>R</div><div>messageCreationDate</div></div> <div><div>2</div><div>Message.content or Post.imageFile</div><div>String</div><div>R</div><div>messageContent</div></div>				

### Interactive / short / 5

IS 1	query	Interactive / short / 5				
IS 2	title	Creator of a message				
IS 3	pattern	<div><div>Message</div><div>hasCreator→</div><div>person: Person id lastName birthday ipAddress browser</div></div>				
IS 4						
IS 5						
IS 6						
IS 7						
	desc.	Given a Message, retrieve its author.				
	params	<div><div>1</div><div>Message.id</div><div>ID</div><div>messageId</div></div>				
	result	<div><div>1</div><div>Message-hasCreator→Person.id</div><div>ID</div><div>R</div><div>personId</div></div>				
		<div><div>2</div><div>Message-hasCreator→Person.firstName</div><div>String</div><div>R</div><div>firstName</div></div>				
		<div><div>3</div><div>Message-hasCreator→Person.lastName</div><div>String</div><div>R</div><div>lastName</div></div>				

### Interactive / short / 6

IS 1

IS 2

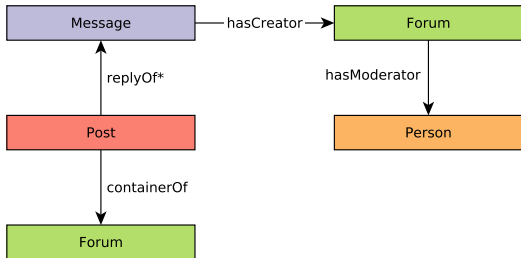
IS 3

IS 4

IS 5

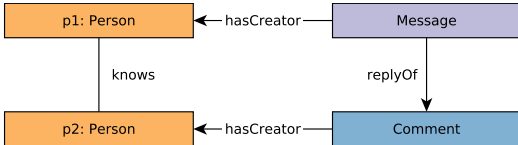
IS 6

IS 7

query	Interactive / short / 6																													
title	Forum of a message																													
pattern																														
desc.	Given a Message, retrieve the Forum that contains it and the Person that moderates that Forum. Since Comments are not directly contained in Forums, for Comments, return the Forum containing the original Post in the thread which the Comment is replying to.																													
params	<table><tr><td>1</td><td>Message.id</td><td>ID</td><td colspan="2">messageId</td></tr></table>					1	Message.id	ID	messageId																					
1	Message.id	ID	messageId																											
result	<table><tr><td>1</td><td>Message&lt;-containerOf-Forum.id</td><td>ID</td><td>R</td><td>forumId</td></tr><tr><td>2</td><td>Message&lt;-containerOf-Forum.title</td><td>String</td><td>R</td><td>forumTitle</td></tr><tr><td>3</td><td>Message&lt;-containerOf-Forum-hasModerator-&gt;Person.id</td><td>ID</td><td>R</td><td>moderatorId</td></tr><tr><td>4</td><td>Message&lt;-containerOf-Forum-hasModerator-&gt;Person.firstName</td><td>String</td><td>R</td><td>moderatorFirstName</td></tr><tr><td>5</td><td>Message&lt;-containerOf-Forum-hasModerator-&gt;Person.lastName</td><td>String</td><td>R</td><td>moderatorLastName</td></tr></table>					1	Message<-containerOf-Forum.id	ID	R	forumId	2	Message<-containerOf-Forum.title	String	R	forumTitle	3	Message<-containerOf-Forum-hasModerator->Person.id	ID	R	moderatorId	4	Message<-containerOf-Forum-hasModerator->Person.firstName	String	R	moderatorFirstName	5	Message<-containerOf-Forum-hasModerator->Person.lastName	String	R	moderatorLastName
1	Message<-containerOf-Forum.id	ID	R	forumId																										
2	Message<-containerOf-Forum.title	String	R	forumTitle																										
3	Message<-containerOf-Forum-hasModerator->Person.id	ID	R	moderatorId																										
4	Message<-containerOf-Forum-hasModerator->Person.firstName	String	R	moderatorFirstName																										
5	Message<-containerOf-Forum-hasModerator->Person.lastName	String	R	moderatorLastName																										

IS 1  
IS 2  
IS 3  
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IS 7

Interactive / short / 7

query	Interactive / short / 7									
title	Replies of a message									
pattern										
desc.	Given a Message, retrieve the (1-hop) Comments that reply to it. In addition, return a boolean flag <code>knows</code> indicating if the author of the reply knows the author of the original message. If author is same as original author, return false for <code>knows</code> flag.									
params	<table><tr><td>1</td><td>Message.id</td><td>ID</td><td colspan="2">messageId</td></tr></table>					1	Message.id	ID	messageId	
1	Message.id	ID	messageId							
result	1	Message<-replyOf-Comment.id	ID	R	commentId					
	2	Message<-replyOf-Comment.content	String	R	commentContent					
	3	Message<-replyOf-Comment.creationDate	DateTime	R	commentCreationDate					
	4	Comment-hasCreator->Person.id	ID	R	replyAuthorId					
	5	Comment-hasCreator->Person.firstName	String	R	replyAuthorFirstName					
	6	Comment-hasCreator->Person.lastName	String	R	replyAuthorLastName					
	7	knows	Boolean	C	replyAuthorKnowsOriginal• MessageAuthor					
sort	1	Message<-replyOf-Comment.creationDate	↓							
	2	Comment-hasCreator->Person.id	↑							