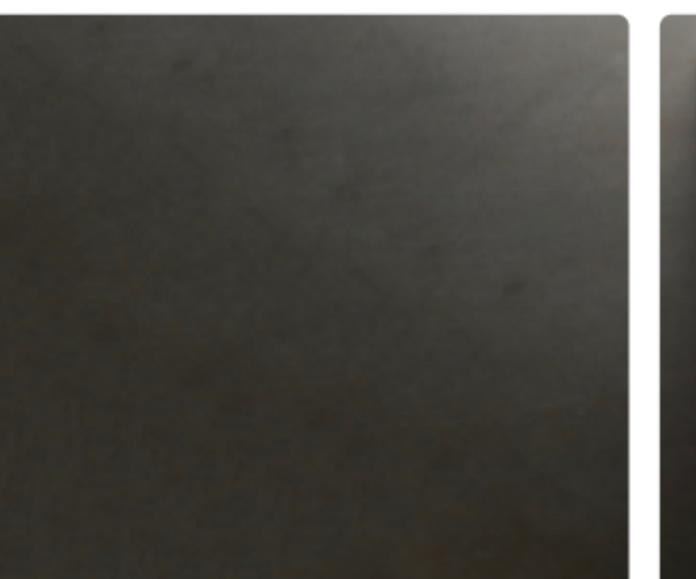
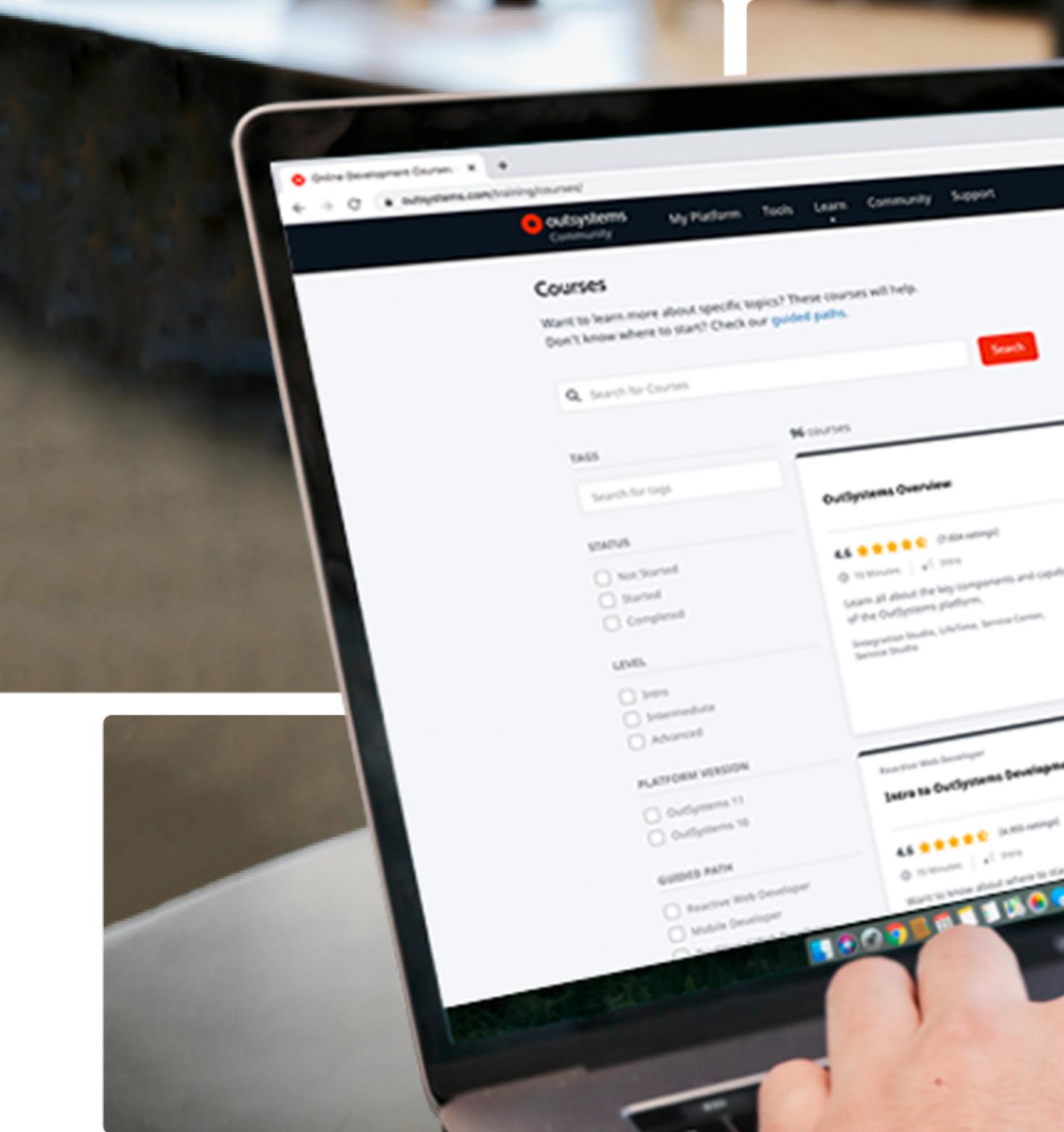




# Data Model Integrity

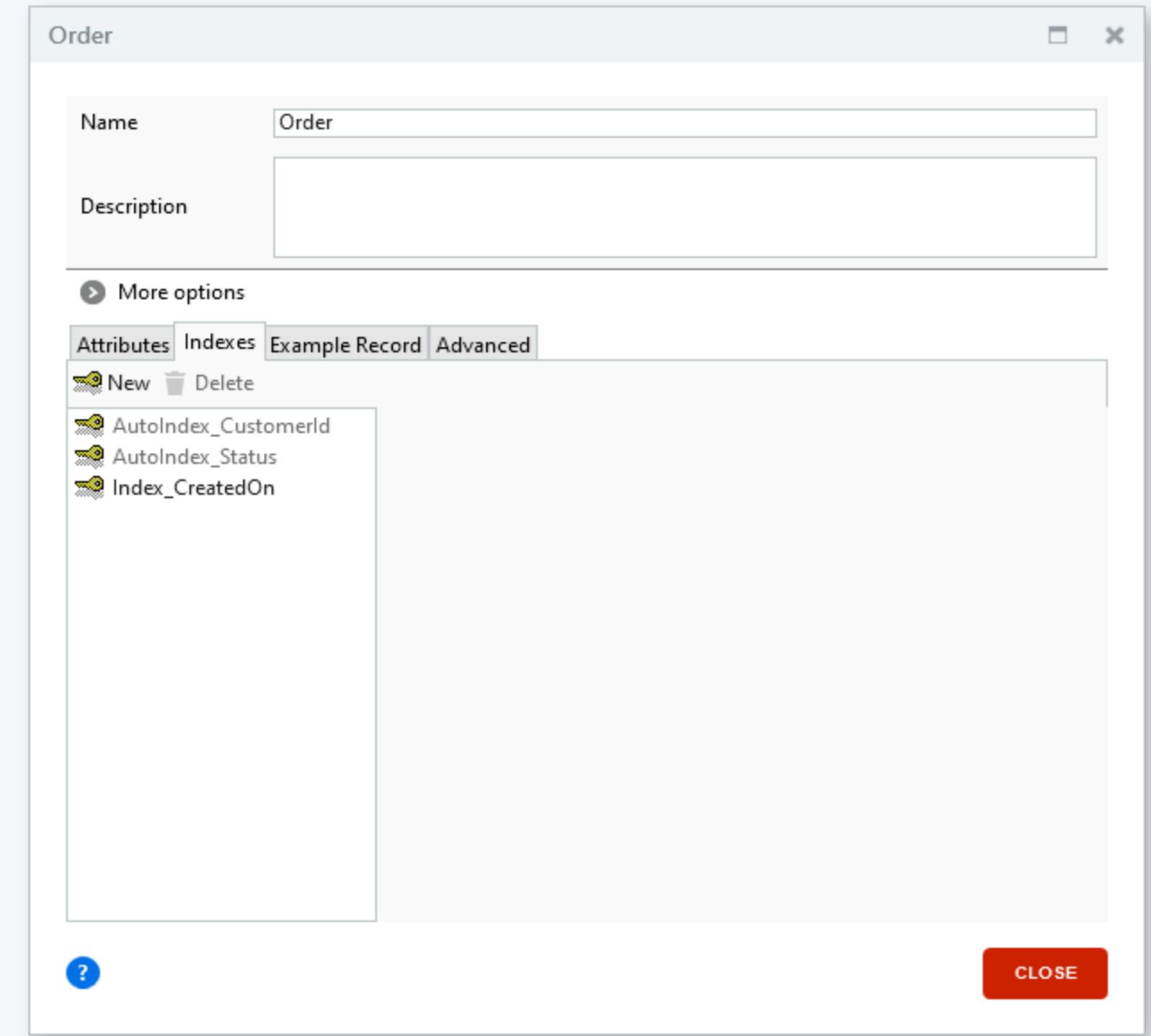
Indexes

Referential Integrity



# Indexes

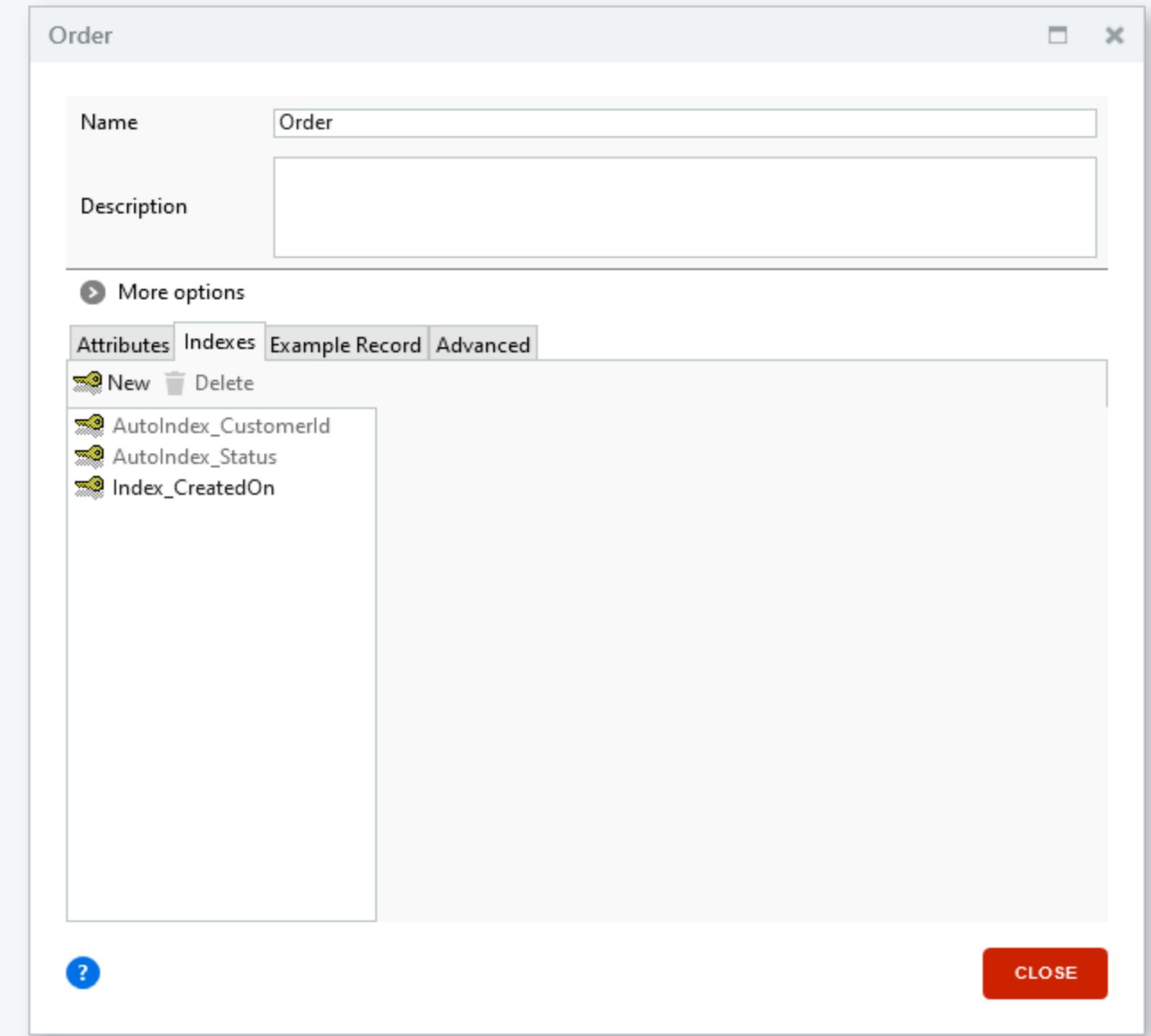
Speed up data retrieval over certain attributes



# Indexes

Speed up data retrieval over certain attributes

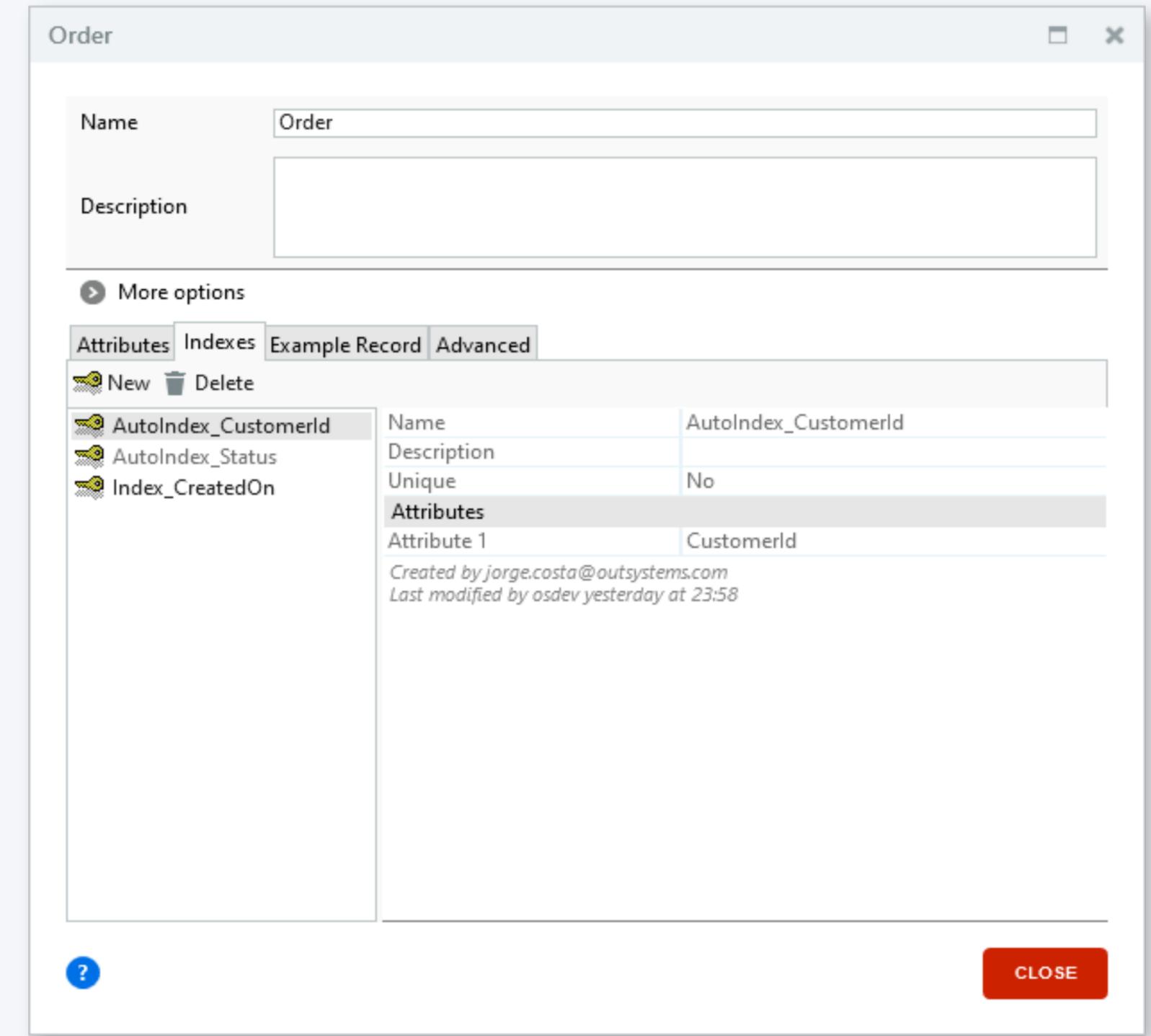
- Costs additional writes and storage space



# Indexes

Speed up data retrieval over certain attributes

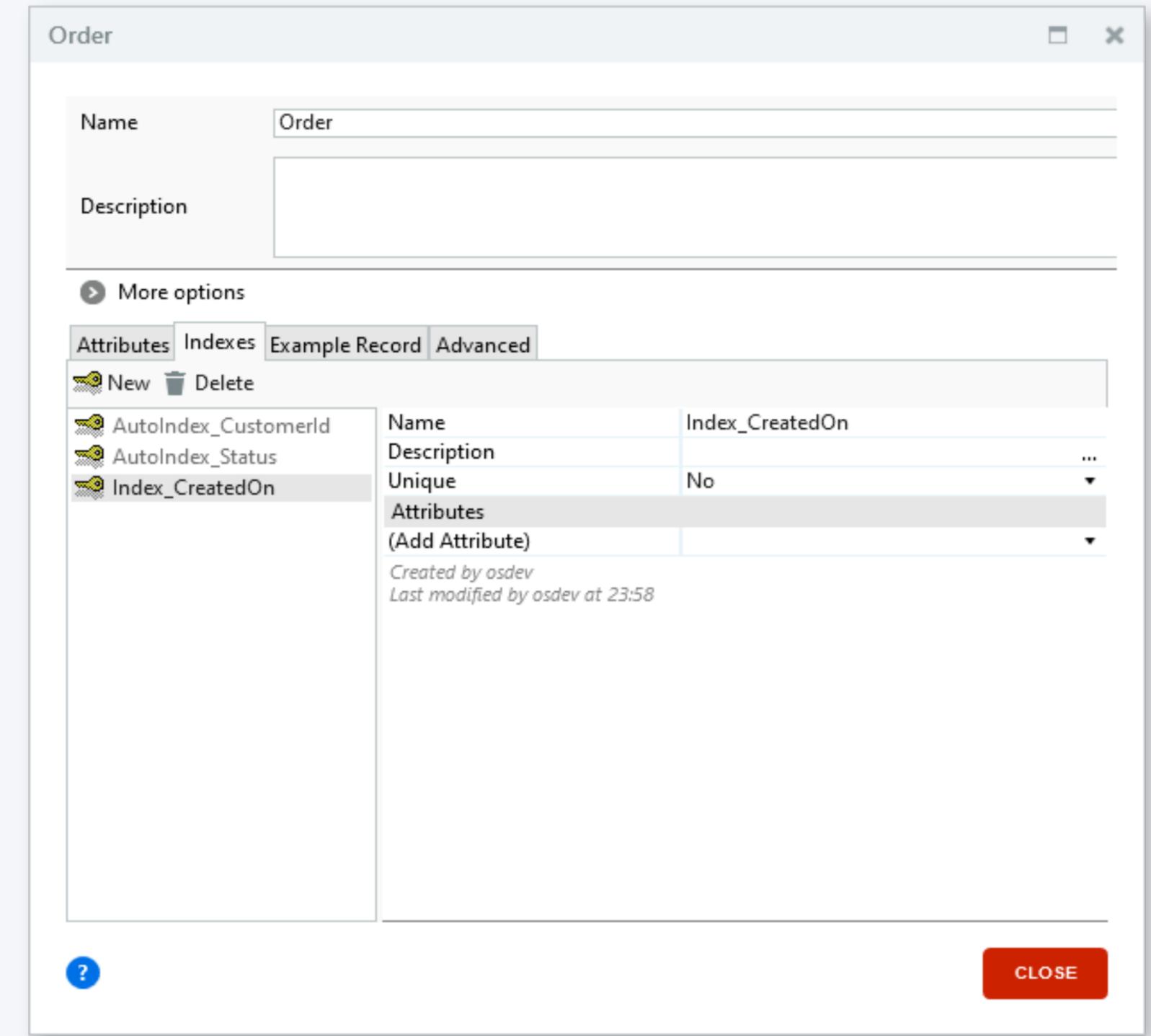
- Costs additional writes and storage space
- Reference attributes have automatically created indexes



# Indexes

Speed up data retrieval over certain attributes

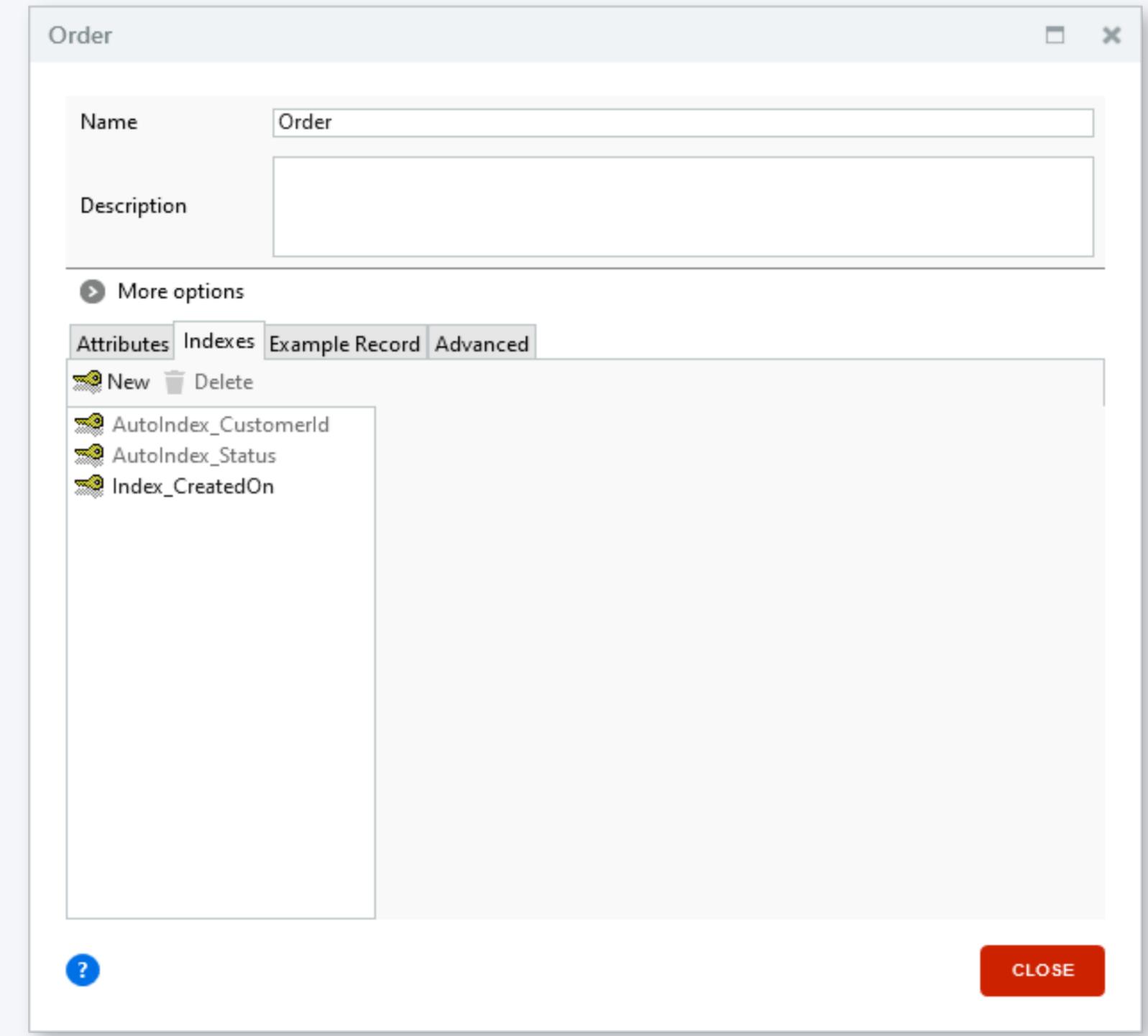
- Costs additional writes and storage space
- Reference attributes have automatically created indexes
- Custom indexes can be created



# Indexes

Speed up data retrieval over certain attributes

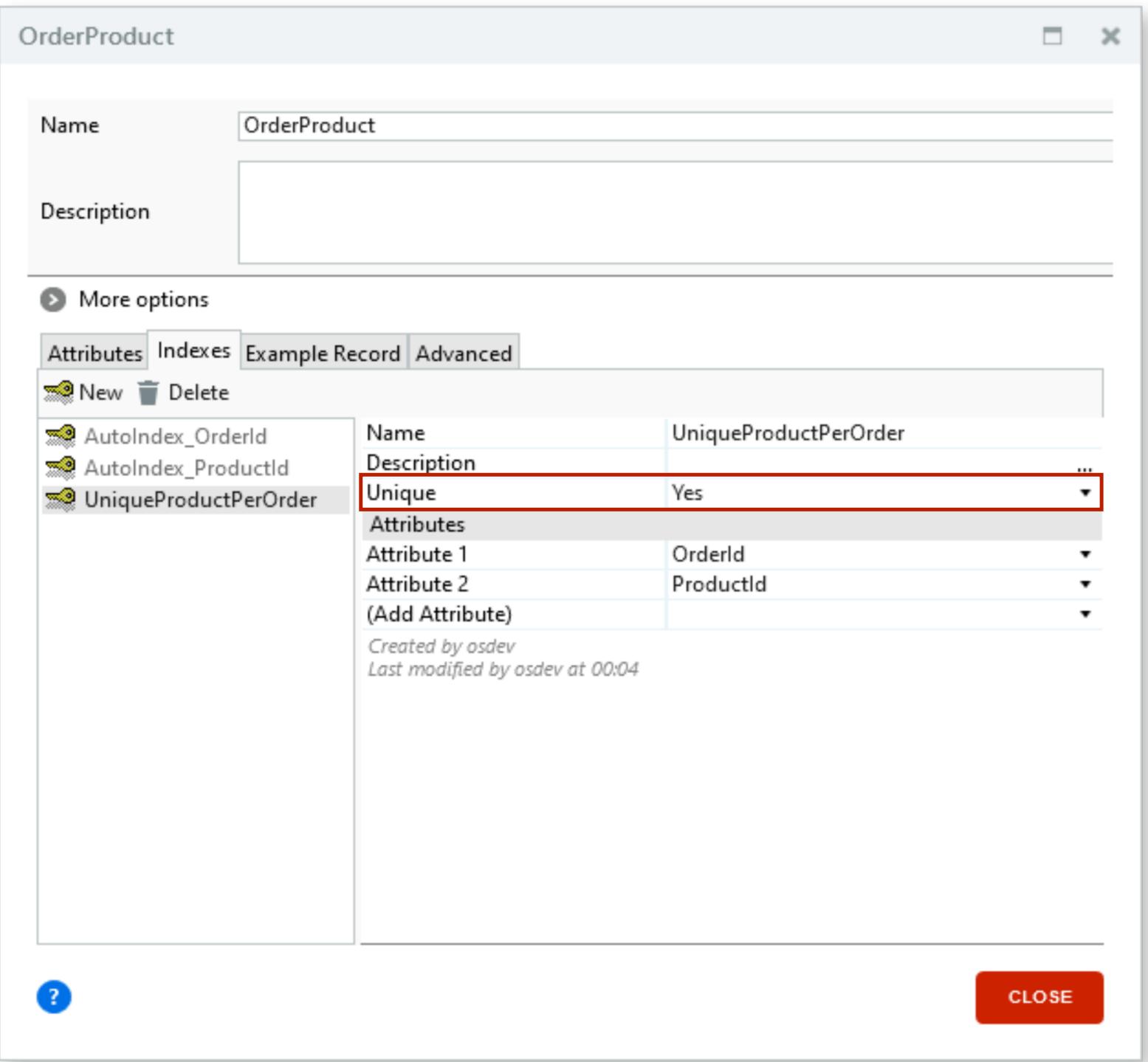
- Costs additional writes and storage space
- Reference attributes have automatically created indexes
- Custom indexes can be created



# Unique Indexes

Avoid duplicates

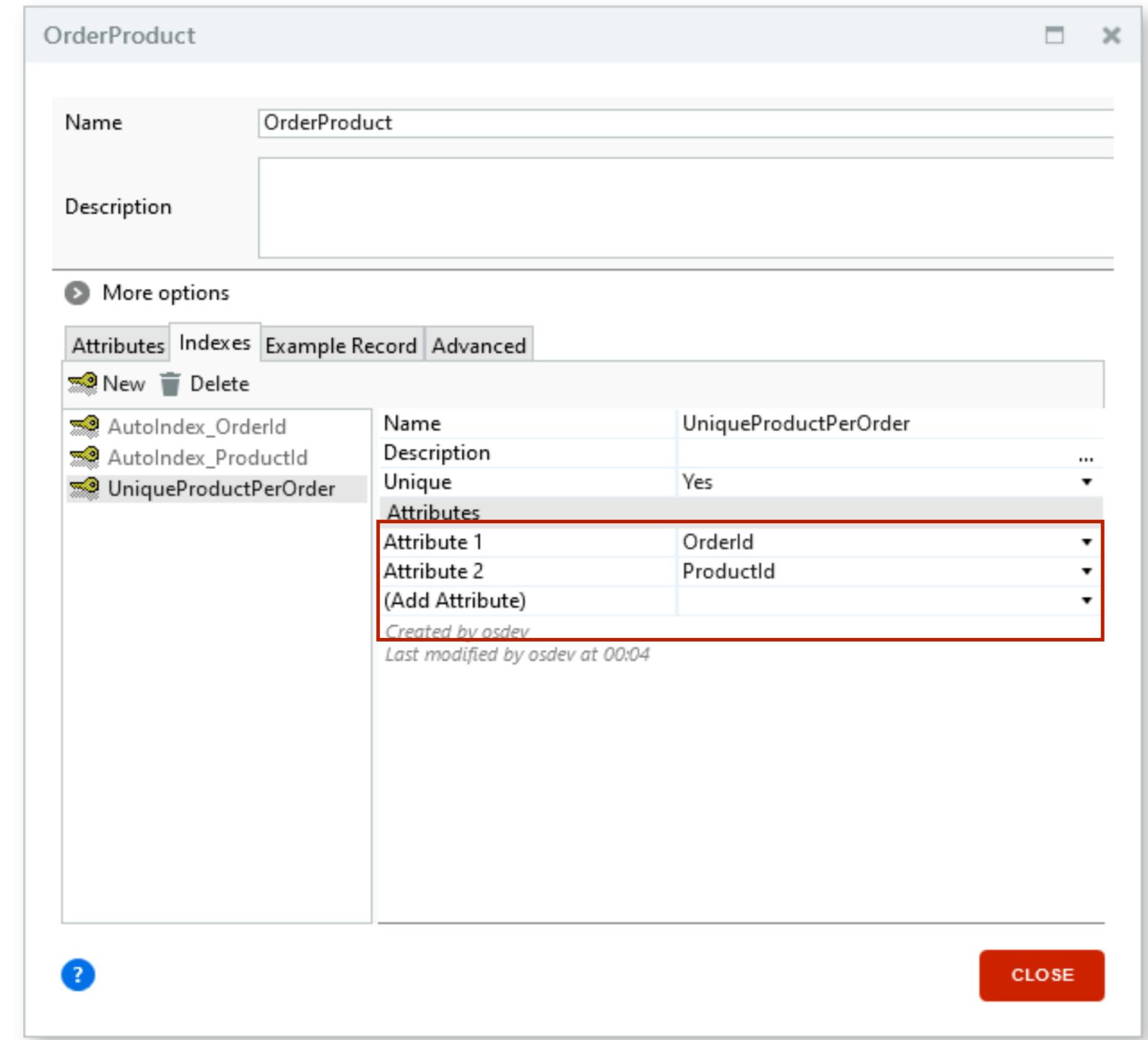
- Define the Index as Unique



# Unique Indexes

## Avoid duplicates

- Define the Index as Unique
- Combine one or more attributes



# Referential Integrity

The screenshot shows the OutSystems Studio interface. The top navigation bar includes icons for Processes, Interface, Logic, Data (selected), and a search function. The left sidebar displays a project structure for 'SQLDemo', with 'Entity Diagrams' and 'Entities' expanded. Under 'Entities', a 'Database' folder contains three entities: Customer, Employee, and Order. The 'Order' entity is currently selected, showing its attributes: Id, Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The 'CustomerId' attribute is highlighted in the details pane at the bottom. The details pane shows the following properties for the CustomerId attribute:

Name	CustomerId
Description	...
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

Delete Rule property of the reference attribute

# Referential Integrity

The screenshot shows the OutSystems Studio interface. The top navigation bar has tabs: Processes, Interface, Logic, Data (which is selected), and a search icon. The left sidebar shows a project named "SQLDemo" with Entity Diagrams and Entities. Under Entities, there is a Database folder containing Customer, Employee, and Order entities. The Order entity has attributes: Id, Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The CustomerId attribute is selected and its properties are shown in the details pane below. The "Delete Rule" property is highlighted with a red border.

Name	CustomerId
Description	Customer
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

Delete Rule property of the reference attribute

Applied when deleting a record from the referenced Entity (e.g. Customer)

# Referential Integrity

The screenshot shows the OutSystems Studio interface. The top navigation bar includes icons for Processes, Interface, Logic, Data, and a search function. The left sidebar shows a project structure under 'SQLDemo' with 'Entity Diagrams' and 'Entities'. Under 'Entities', there's a 'Database' folder containing 'Customer', 'Employee', and 'Order' entities. The 'Customer' entity is selected, and its attributes are listed: Id, Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The 'CustomerId' attribute is currently selected, highlighted in grey. Its properties are displayed in a table:

Name	CustomerId
Description	
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

A context menu is open at the bottom right of the 'Delete Rule' field, listing three options: Protect, Delete, and Ignore. The 'Protect' option is highlighted.

## Delete Rule property of the reference attribute

Applied when deleting a record from the referenced Entity (e.g. Customer)

- **Protect** - does not allow deleting the record
  - Customer with Orders is not deleted

# Referential Integrity

The screenshot shows the OutSystems Studio interface. At the top, there are four navigation icons: Processes, Interface, Logic, and Data. Below them, a project tree shows a single item named 'SQLDemo'. Under 'SQLDemo', there is a folder 'Entity Diagrams' and a folder 'Entities'. Inside 'Entities', there is a folder 'Database' which contains three entities: 'Customer', 'Employee', and 'Order'. Each entity has several attributes listed below it. The 'Customer' entity has attributes: Id (red square), Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The 'Employee' entity has attributes: Id (red square), FirstName, LastName, Title, BirthDate, HireDate, Address, City, State, Zip, and Photo. The 'Order' entity has attributes: Id (red square), CustomerId, OrderId, OrderDate, RequiredOn, ShippedOn, Status, and Comment. In the bottom right corner of the screenshot, a context menu is open over the 'CustomerId' attribute of the 'Customer' entity. The menu items are: Protect (highlighted in blue), Delete, and Ignore.

Name	Description
CustomerId	Customer
Description	Customer Identifier
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

- Protect
- Delete
- Ignore

## Delete Rule property of the reference attribute

Applied when deleting a record from the referenced Entity (e.g. Customer)

- **Protect** - does not allow deleting the record
  - Customer with Orders is not deleted
- **Delete** - deletes the record and cascades delete all the records that reference it
  - Customer and all its Orders are deleted

# Referential Integrity

The screenshot shows the OutSystems Studio interface. At the top, there are navigation icons for Processes, Interface, Logic, Data, and a search bar. The main area displays a project structure under 'SQLDemo' with 'Entity Diagrams' and 'Entities'. Under 'Entities', there is a 'Database' section containing 'Customer', 'Employee', and 'Order' entities. The 'Customer' entity is expanded, showing attributes: Id (red square), Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The 'CustomerId' attribute is selected, and its details are shown in a modal dialog. The dialog includes fields for Name (CustomerId), Description, Label (Customer), Data Type (Customer Identifier), Is Mandatory (No), and Delete Rule. A dropdown menu for 'Delete Rule' is open, showing three options: Protect (selected), Delete, and Ignore.

Name	CustomerId
Description	
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

- Protect
- Delete
- Ignore

## Delete Rule property of the reference attribute

Applied when deleting a record from the referenced Entity (e.g. Customer)

- **Protect** - does not allow deleting the record
  - Customer with Orders is not deleted
- **Delete** - deletes the record and cascades delete all the records that reference it
  - Customer and all its Orders are deleted
- **Ignore** - does not guarantee referential integrity
  - Customer is deleted. Orders are kept

# Referential Integrity

The screenshot shows the OutSystems Studio interface. At the top, there are navigation icons for Processes, Interface, Logic, Data, and a search bar. Below the navigation bar, the project tree shows a project named "SQLDemo" with Entity Diagrams and Entities. Under Entities, there is a Database node with three entities: Customer, Employee, and Order. The Order entity has attributes: Id, Description, DueDate, CreatedOn, ShippedOn, Status, and CustomerId. The CustomerId attribute is selected, and its details are shown in the main panel. The details panel shows the following information:

Name	CustomerId
Description	
Label	Customer
Data Type	Customer Identifier
Is Mandatory	No
Delete Rule	Protect

A context menu is open at the bottom right of the Delete Rule field, listing three options: Protect, Delete, and Ignore. The "Protect" option is highlighted.

## Delete Rule property of the reference attribute

Applied when deleting a record from the referenced Entity (e.g. Customer)

- **Protect** - does not allow deleting the record
  - Customer with Orders is not deleted
- **Delete** - deletes the record and cascades delete all the records that reference it
  - Customer and all its Orders are deleted
- **Ignore** - does not guarantee referential integrity
  - Customer is deleted. Orders are kept