

Project 1: Credit Card Billing Application

For this application, following are the activities that I will focus on to achieve the goal:

- Project Roadmap Planning
- Data Model Designing
- Formula Fields
- Relationships
- Apex Trigger Implementation
- Visualforce Page Creation

Project Roadmap Planning:

The IT Head of EDU Bank wants to build an application to capture all the information about the customers, credit card types and calculate the credit card bill of their customer.

I as '**System Administrator**' will help them by providing solution quickly to boost the service.

To provide quick solution. For Admin part, I will create a **Custom Application** and the **Objects** and **Fields** according to the requirements, will create **Relationship** between objects and some **Formula Fields** to calculate the value of a field based on the data present in other fields. I can make the set ups accordingly in the org. I will add more **Users** who will work on the application.

For Developer part, I will

Data Model Designing:

Firstly, I created a **new lightning application** named '**Credit Card Billing**'. While creating, entered the app name, description. Added necessary user profiles 'System administrator' to be able to work on this application.

Created new lightning app by going on Setup:

New Lightning App

App Details & Branding

Give your Lightning app a name and description. Upload an image and choose the highlight color for its navigation bar.

App Details

*App Name: Credit Card Billing

*Developer Name: Credit_Card_Billing

Description: This application is able to calculate the Credit Card Bill based on the customer usage and type of card.

App Branding

Image:  Primary Color Hex Value: #0070D2

Org Theme Options: Use the app's image and color instead of the org's custom theme

Next

Mobile Apps

ID	Category	Type	Description	Created Date	Version	Action
12	Marketing	Marketing	Best-in-class on-demand marketing automation	14/10/2023, 11:27 pm	Classic	<input type="button" value="Edit"/>
13	Platform	Platform	The fundamental Lightning Platform	14/10/2023, 11:27 pm	Classic	<input type="button" value="Edit"/>
14	Queue Management	QueueManagement	Create and manage queues for your business.	14/10/2023, 11:27 pm	Lightning	<input type="button" value="Edit"/>

New Lightning App

User Profiles

Choose the user profiles that can access this app.

Available Profiles

Type to filter list...

Selected Profiles

Marketing User
Minimum Access - Salesforce
Partner App Subscription User
Partner Community Login User
Partner Community User
Read Only
Salesforce API Only System Integrations

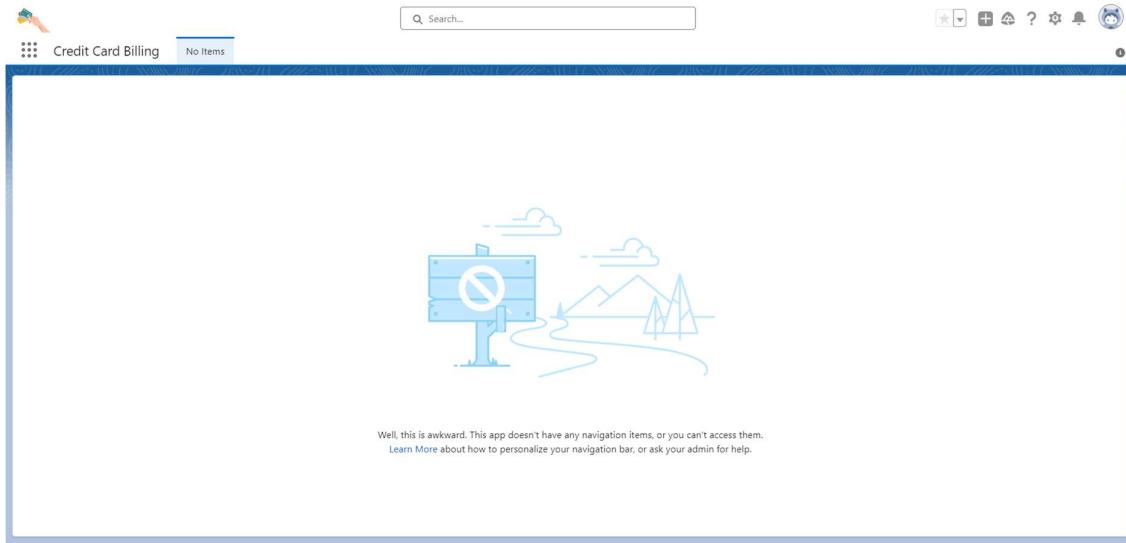
Back

Save & Finish

Mobile Apps

ID	Category	Type	Description	Created Date	Version	Action
12	Marketing	Marketing	Best-in-class on-demand marketing automation	14/10/2023, 11:27 pm	Classic	<input type="button" value="Edit"/>
13	Platform	Platform	The fundamental Lightning Platform	14/10/2023, 11:27 pm	Classic	<input type="button" value="Edit"/>
14	Queue Management	QueueManagement	Create and manage queues for your business.	14/10/2023, 11:27 pm	Lightning	<input type="button" value="Edit"/>

'Credit Card Billing' Application added in the org:



Every application needs to store its data and that will be in the form of objects and fields.

Creating Object:

The requirement of EDU Bank application i.e. Credit Card Billing is that it needs to capture information about the Customers, Credit Card Master and wants to calculate the bill.

So, the objects involved in this application: -

Customers, Credit Card Master, and Billing Information.

All these objects are custom objects.

Object – customer

New Custom Object

Custom Object Definition Edit

Custom Object Information

The singular and plural labels are used in tabs, page layouts, and reports.

Label	Customer	Example: Account
Plural Label	Customers	Example: Accounts

Starts with vowel sound

The Object Name is used when referencing the object via the API.

Object Name	Customer	Example: Account
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Description

Context-Sensitive Help Setting

- Open the standard Salesforce.com Help & Training window
- Open a window using a Visualforce page

Content Name

New Custom Object Tab

Step 1. Enter the Details Step 1 of 3

Choose the custom object for this new custom tab. Fill in other details.

Select an existing custom object or [create a new custom object now](#).

Object: **Customer**

Tab Style: **People**

(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link: **-None-**

Enter a short description.

Description:

Next **Cancel**

New Custom Object

New Custom Object

Permissions for this object are disabled for all profiles by default. You can enable object permissions in permission sets or by editing custom profiles. [Tell me more](#) [Don't show this message again](#)

Custom Object Definition Edit

Custom Object Information

The singular and plural labels are used in tabs, page layouts, and reports.

Label: **Credit Card Master** Example: Account

Plural Label: **Credit Card Master** Example: Accounts

Starts with vowel sound:

The Object Name is used when referencing the object via the API.

Object Name: **Credit_Card_Master** Example: Account

Description:

Context-Sensitive Help Setting:

- Open the standard Salesforce.com Help & Training window
- Open a window using a Visualforce page

Content Name: **-None-**

Enter Record Name Label and Format

The screenshot shows the Salesforce Setup interface with the 'Tabs' tab selected. On the left, a sidebar lists various setup categories like Setup Home, Service Setup Assistant, and Administration. The main content area is titled 'New Custom Object Tab' and is divided into sections: 'Step 1. Enter the Details' (Step 1 of 3), 'Choose the custom object for this new custom tab. Fill in other details.', and 'Enter a short description.' A preview window shows a tab labeled 'Credit card' with a 'Credit Card Master' object selected. Below it, there's a dropdown for 'Splash Page Custom Link' set to 'None'. A large text input field for 'Description' is empty. At the bottom right are 'Next' and 'Cancel' buttons.

The screenshot shows the Salesforce Setup interface with the 'New Custom Object' configuration page. The top navigation bar includes 'SETUP', 'Home', and 'Object Manager'. The main content area is titled 'Custom Object Definition Edit' and contains several sections: 'Custom Object Information' (with fields for Label, Plural Label, and Starts with vowel sound), 'Object Name' (with fields for Object Name and Example: Account), 'Description' (with a large text input field), 'Context-Sensitive Help Setting' (with options for standard Help & Training window or Visualforce page), 'Content Name' (with a dropdown set to 'None'), and 'Enter Record Name Label and Format' (with fields for Record Name and Example: Account Name). Buttons at the top right include 'Save', 'Save & New', and 'Cancel'.

The screenshot shows the Salesforce Setup interface with the 'Tabs' page selected. A search bar at the top right contains the text 'Search Setup'. The left sidebar has sections for Data (Picklist Settings, State and Country/Territory Picklists), Objects and Fields (Picklist Value Sets), and a global search bar. The main content area is titled 'New Custom Object Tab' and is divided into steps. Step 1, 'Enter the Details', asks to choose a custom object ('Billing Information' is selected) and a tab style ('Stack of Cash'). It also includes an optional field for a splash page custom link ('None'). A description field is present but empty. Navigation buttons 'Next' and 'Cancel' are at the bottom right.

The screenshot shows the Lightning App Builder interface with the 'App Settings' tab selected. The top navigation bar includes links for Lightning App Builder, App Settings, Pages, and Credit Card Billing, along with a Help icon. The left sidebar has sections for App Details & Branding, App Options, Utility Items (Desktop Only), and 'Navigation Items' (which is currently selected). Under 'Navigation Items', there are sections for User Profiles and Available Items. The 'Available Items' section contains a search bar and a list with one item: 'Mobile Home'. The 'Selected Items' section contains three items: 'Customers', 'Credit Card Master', and 'Billing Information'. Navigation arrows between the two lists allow items to be moved. At the bottom are 'Cancel' and 'Save' buttons.

Creating Fields:

In all custom objects, some custom fields are created according to the requirement.

Customer Object –

- Customer Name : Text
- Phone : Phone
- Email : Email
- SSN : Number (9,0)

Credit Card Master Object –

- Credit Card Master Name: Name
- Card Limit : Currency
- Charges Per Transaction: Currency
- Comments : Text Area
- Monthly Crad Fees : Currency

Billing Information Object –

- Billing Id : Auto Number
- Credit Card Number : Number (10, 0)
- Amount Swiped : Currency
- Cash Withdrawal : Currency
- Total Transactions : Number (18, 0)
- Months : Picklist
- Start Date : Formula (Date)
- End Date : Formula (Date)
- Due Date : Formula (Date)
- Total Outstanding Amount: Formula (Currency)
- Customer : Master-Detail (Customer)
- Credit Card Master : Master-Detail (Credit Card Master)

Object: Customer

Fields:

The screenshot shows the Salesforce Object Manager interface for the 'Customer' object. The left sidebar lists various configuration options: Details, Fields & Relationships (selected), Page Layouts, Lightning Record Pages, Buttons, Links, and Actions, Compact Layouts, Field Sets, Object Limits, Record Types, Related Lookup Filters, Search Layouts, List View Button Layout, Restriction Rules, and Scoping Rules. The main pane displays a list of field types with their descriptions:

- Checkbox: Allows users to select a true (checkbox) or false (checkbox) value.
- Currency: Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.
- Date: Allows users to enter a date or pick a date from a popup calendar.
- Date/Time: Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
- Email: Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
- Geolocation: Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
- Number: Allows users to enter any number. Leading zeros are removed.
- Percent: Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
- Phone: (Selected) Allows users to enter any phone number. Automatically formats it as a phone number.
- Picklist: Allows users to select a value from a list you define.
- Picklist (Multi Select): Allows users to select multiple values from a list you define.
- Text: Allows users to enter any combination of letters and numbers.
- Text Area: Allows users to enter up to 255 characters on separate lines.
- Text Area (Long): Allows users to enter up to 131,072 characters on separate lines.
- Text Area (Rich): Allows users to enter formatted text, add images and links. Up to 131,072 characters on separate lines.
- Text (Encrypted): Allows users to enter any combination of letters and numbers and store them in encrypted form.
- Time: Allows users to enter a local time. For example, "2:40 PM", "14:40", "14:40 00", and "14:40 50 600" are all valid times for this field.
- URL: Allows users to enter any valid website address. When users click on the field, the URL will open in a separate browser window.

The screenshot shows the 'New Custom Field' wizard, Step 2: Enter the details. The left sidebar is identical to the previous screenshot. The main pane shows the following fields:

- Field Label:** Phone
- Field Name:** Phone
- Description:** (Empty text area)
- Help Text:** (Empty text area)
- Required:** Always require a value in this field in order to save a record
- Auto add to custom report type:** Add this field to existing custom report types that contain this entry
- Default Value:** Show Formula Editor

A note at the bottom of the 'Default Value' section states: "Use formula syntax. Enclose text and picklist value API names in double quotes: 'the_Value', include numbers without quotes (12), show percentages as decimal (.12), and express date calculations in the standard format '(Today() + 7)'. To reference a field from a custom Metadata type, use <CustomMetadata>[field_name]> and <CustomMetadata>[field_name]</>".

The screenshot shows the Salesforce Object Manager interface for the 'Customer' object. The left sidebar lists various setup options like Details, Page Layouts, Lightning Record Pages, etc. The main content area is titled 'Customer' and shows the 'Fields & Relationships' section. A table lists field types with their descriptions:

Field Type	Description
External Lookup Relationship	The relationship field is required on all detail records. It's owned by and visible on all detail records. Values are determined by the master record.
Checkbox	Allows users to select a True (checked) or False (unchecked) value.
Currency	Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.
Date	Allows users to enter a date or pick a date from a popup calendar.
DateTime	Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
Email	Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
Geolocation	Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
Number	Allows users to enter any number. Leading zeros are removed.
Percent	Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
Phone	Allows users to enter any phone number. Automatically formats it as a phone number.
Picklist	Allows users to select a value from a list you define.
Picklist (Multi-Select)	Allows users to select multiple values from a list you define.
Text	Allows users to enter any combination of letters and numbers.
Text Area	Allows users to enter up to 255 characters on separate lines.
Text Area (Long)	Allows users to enter up to 131,072 characters on separate lines.

The screenshot shows the process of creating a new custom field for the 'Customer' object. The left sidebar is identical to the previous screenshot. The main content area is titled 'Customer New Custom Field' and shows 'Step 2. Enter the details'. The form fields are as follows:

Field Label	Email
Field Name	Email
Description	(empty)
Help Text	(empty)
Required	<input type="checkbox"/> Always require a value in this field in order to save a record
Unique	<input type="checkbox"/> Do not allow duplicate values
External ID	<input type="checkbox"/> Set this field as the unique record identifier from an external system
Auto add to custom report type	<input checked="" type="checkbox"/> Add this field to existing custom report types that contain this entry
Default Value	Show Formula Editor

A note at the bottom of the form states: "Use formula syntax. Enclose text and quoted values in double quotes ("Text_Value"). Include numbers without quotes ('123'). Always enclose numbers as decimal (.123) and express date calculations in the standard format (Today() - 7). To reference a field from a Custom Metadata type record use \$CustomMetadataType__mdt RecordName.FieldName".

SETUP > OBJECT MANAGER
Customer

Details

Fields & Relationships

Date

Allows users to enter a date or pick a date from a popup calendar.

Date/Time

Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.

Email

Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.

Geolocation

Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.

Number

Allows users to enter any number. Leading zeros are removed.

Percent

Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.

Phone

Allows users to enter any phone number. Automatically formats it as a phone number.

Picklist

Allows users to select a value from a list you define.

Picklist (Multi-Select)

Allows users to select multiple values from a list you define.

Text

Allows users to enter any combination of letters and numbers.

Text Area

Allows users to enter up to 255 characters on separate lines.

Text Area (Long)

Allows users to enter up to 131,072 characters on separate lines.

Text Area (Rich)

Allows users to enter formatted text, add images and links. Up to 131,072 characters on separate lines.

Text (Encrypted) (1)

Allows users to enter any combination of letters and numbers and store them in encrypted form.

Time

Allows users to enter a local time. For example, "2:45 PM", "14:40", "14:40:00", and "14:40:50:60" are all valid times for this field.

URL

Allows users to enter any valid website address. When users click on the field, the URL will open in a separate browser window.

Next | Cancel

SETUP > OBJECT MANAGER
Customer

New Custom Field

Step 2. Enter the details Step 2 of 4

Previous | Next | Cancel

Field Label **SSN**

Please enter the length of the number and the number of decimal places. For example, a number with a length of 8 and 2 decimal places can accept values up to "12345678.90".

Length **9**

Number of digits to the left of the decimal point

Decimal Places **0**

Number of digits to the right of the decimal point

Field Name **SSN**

Description

Help Text

Required Always require a value in this field in order to save a record

Unique Do not allow duplicate values

External ID Set this field as the unique record identifier from an external system

AI Prediction Use this field to store AI prediction scores

Auto add to custom report type Add this field to existing custom report types that contain this entity (1)

The screenshot shows the Salesforce Object Manager interface for the 'Customer' object. The left sidebar lists various setup options like Page Layouts, Lightning Record Pages, and Field Sets. The main content area is titled 'Fields & Relationships' and displays a table of fields:

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Created By	CreatedById	Lookup(User)		
Customer Name	Name	Text(80)		✓
Email	Email__c	Email		
Last Modified By	LastModifiedById	Lookup(User)		
Owner	OwnerId	Lookup(User,Group)		✓
Phone	Phone__c	Phone		
SSN	SSN__c	Number(9, 0)		

Object – Credit card master

Fields:

The screenshot shows the Salesforce Object Manager interface for the 'Credit Card Master' object. The left sidebar lists various setup options. The main content area is titled 'Fields & Relationships' and shows a list of field types with their descriptions:

- Date: Allows users to enter a date or pick a date from a popup calendar.
- Date/Time: Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
- Email: Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
- Geolocation: Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
- Number: Allows users to enter any number. Leading zeros are removed.
- Percent: Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
- Phone: Allows users to enter any phone number. Automatically formats it as a phone number.
- Picklist**: Allows users to select a value from a list you define.
- Picklist (Multi-Select): Allows users to select multiple values from a list you define.
- Text: Allows users to enter any combination of letters and numbers.
- Text Area: Allows users to enter up to 255 characters on separate lines.
- Text Area (Long): Allows users to enter up to 131,072 characters on separate lines.
- Text Area (Rich): Allows users to enter formatted text, add images and links. Up to 131,072 characters on separate lines.
- Text (Encrypted): Allows users to enter any combination of letters and numbers and store them in encrypted form.
- Time: Allows users to enter a local time. For example, '2:40 PM', '14:40', '14:40:00', and '14:40:50:600' are all valid times for this field.
- URL: Allows users to enter any valid website address. When users click on the field, the URL will open in a separate browser window.

Setup | Home | Object Manager

Credit Card Master

New Custom Field

Step 2. Enter the details

Field Label: Card Type

Values: Use global picklist value set
 Enter values, with each value separated by a new line
 Card Type

Field Name: Card_Type

Description:

Help Text:

Required: Always require a value in this field in order to save a record

Step 2 of 4

Previous Next Cancel

Setup | Home | Object Manager

Credit Card Master

Fields & Relationships

- Details
- Fields & Relationships
- Page Layouts
- Lightning Record Pages
- Buttons, Links, and Actions
- Compact Layouts
- Field Sets
- Object Limits
- Record Types
- Related Lookup Filters
- Search Layouts
- List View Button Layout
- Restriction Rules
- Scoping Rules

Lookup Relationship

Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Master-Detail Relationship

Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records
- The master record is required to determine which detail records are associated with it
- When a user deletes the master record, all detail records are deleted
- You can create rollup summary fields on the master record to summarize the detail records

External Lookup Relationship

Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.

Currency

Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.

Date

Allows users to enter a date or pick a date from a popup calendar.

Date/Time

Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.

Email

Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.

Geolocation

Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.

Number

Allows users to enter any number. Leading zeros are removed.

Percent

Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.

Phone

Allows users to enter any phone number. Automatically formats it as a phone number.

Picklist

Allows users to select a value from a list you define.

Picklist (Multi-Select)

Allows users to select multiple values from a list you define.

Setup > Object Manager Credit Card Master

New Custom Field

Step 2. Enter the details

Field Label: Monthly Card Fees

Length: 18
Number of digits to the left of the decimal point

Decimal Places: 0
Number of digits to the right of the decimal point

Field Name: Monthly_Card_Fees

Description:

Help Text:

Required: Always require a value in this field in order to save a record

Auto add to custom report type: Add this field to existing custom report types that contain this entity

Default Value: Show Formula Editor

Use formula syntax: Enclose text and picklist value API names in double quotes ("The Text"), include numbers without quotes

Setup > Object Manager Credit Card Master

Fields & Relationships

- Lookup Relationship
- Master-Detail Relationship
- External Lookup Relationship
- Checkbox
- Currency
- Date
- DateTime
- Email
- Geolocation
- Number
- Percent
- Phone
- Picklist
- Picklist (Multi-Select)
- Text

Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes the master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.

The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.

Allows users to select a True (checked) or False (unchecked) value.

Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.

Allows users to enter a date or pick a date from a pop-up calendar.

Allows users to enter a date and time, or pick a date from a pop-up calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.

Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.

Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.

Allows users to enter any number. Leading zeros are removed.

Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.

Allows users to enter any phone number. Automatically formats it as a phone number.

Allows users to select a value from a list you define.

Allows users to select multiple values from a list you define.

Allows users to enter any combination of letters and numbers.

Credit Card Master

New Custom Field

Step 2. Enter the details

Field Label: **Card Limit**

Please enter the length of the number and the number of decimal places. For example, a number with a length of 8 and 2 decimal places can accept values up to "12345678.90".

Length: **18** Number of digits to the left of the decimal point

Decimal Places: **0** Number of digits to the right of the decimal point

Field Name: **Card_Limit**

Description:

Help Text:

Required: Always require a value in this field in order to save a record

Auto add to custom report type: Add this field to existing custom report types that contain this entity

Default Value: **Show Formula Editor**

Use formula syntax: Enclose text and picklist value API names in double quotes ("The_Label"), include numbers without quotes.

Credit Card Master

Fields & Relationships

- Lookup Relationship
- Master-Detail Relationship
- External Lookup Relationship
- Checkbox
- Currency**
- Date
- Date/Time
- Email
- Geolocation
- Number
- Percent
- Phone
- Picklist
- Picklist (Multi-Select)
- Text

Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes the master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.

The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.

Allows users to select a True (checked) or False (unchecked) value.

Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.

Allows users to enter a date or pick a date from a pop-up calendar.

Allows users to enter a date and time, or pick a date from a pop-up calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.

Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.

Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.

Allows users to enter any number. Leading zeros are removed.

Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.

Allows users to enter any phone number. Automatically formats it as a phone number.

Allows users to select a value from a list you define.

Allows users to select multiple values from a list you define.

Allows users to enter any combination of letters and numbers.

The screenshot shows the Salesforce Setup interface with the following details:

- Object Manager:** Credit Card Master
- Step 2: Enter the details**
- Field Label:** Charges Per Transaction
- Length:** 18
- Decimal Places:** 0
- Field Name:** Charges_Per_Transaction
- Description:** (empty)
- Help Text:** (empty)
- Required:** Always require a value in this field in order to save a record
- Auto add to custom report type:** Add this field to existing custom report types that contain this entity
- Default Value:** Show Formula Editor
Use formula syntax. Enclose text and picklist value API names in double quotes: `("the_text")`, include numbers without quotes

The screenshot shows the Salesforce Setup interface with the following details:

- Object Manager:** Credit Card Master
- Fields & Relationships**
- Table Headers:** FIELD LABEL, FIELD NAME, DATA TYPE, CONTROLLING FIELD, INDEXED
- Table Data:**

FIELD LABEL	FIELD NAME	DATA TYPE	CONTROLLING FIELD	INDEXED
Card Limit	Card_Limit__c	Currency(18, 0)		
Card Type	Card_Type__c	Picklist		
Charges Per Transaction	Charges_Per_Transaction__c	Currency(18, 0)		
Created By	CreatedById	Lookup(User)		
Credit Card Master Name	Name	Text(80)		✓
Last Modified By	LastModifiedById	Lookup(User)		
Monthly Card Fees	Monthly_Card_Fees__c	Currency(18, 0)		
Owner	OwnerId	Lookup(User,Group)		✓

Object – Billing Information

Fields:

The screenshot shows the Salesforce Setup interface with the following details:

- Header:** SETUP > OBJECT MANAGER
- Section:** Billing Information
- Left sidebar:** Details, Fields & Relationships (selected), Page Layouts, Lightning Record Pages, Buttons, Links, and Actions, Compact Layouts, Field Sets, Object Limits, Record Types, Related Lookup Filters, Search Layouts, List View Button Layout, Restriction Rules, Scoping Rules.
- Content Area:** A large list of field types:
 - Formula:** A read-only field that displays the sum, minimum, or maximum value of a field in a related list or the record count of all records listed in a related list.
 - Roll-Up Summary:** A relationship field that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a pop-up list. The other object is the source of the values in the list.
 - Lookup Relationship:** Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:
 - The relationship field is required on all detail records.
 - The ownership and sharing of a detail record are determined by the master record.
 - When a user deletes a master record, all detail records are deleted.
 - You can add roll-up summary fields on the master record to summarize the detail records.
 - Master-Detail Relationship:** The relationship field allows users to click on a lookup icon to select a value from a pop-up list. The master object is the source of the values in the list.
 - External Lookup Relationship:** Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.
 - Checkbox:** Allows users to select a True (checked) or False (unchecked) value.
 - Currency:** Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.
 - Date:** Allows users to enter a date or pick a date from a pop-up calendar.
 - DateTime:** Allows users to enter a date and time, or pick a date from a pop-up calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
 - Email:** Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
 - Geolocation:** Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
 - Number:** Allows users to enter any number. Leading zeros are removed.
 - Percent:** Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
 - Phone:** Allows users to enter any phone number. Automatically formats it as a phone number.
 - Picklist:** Allows users to select a value from a list you define.

The screenshot shows the Salesforce Setup interface during the creation of a new field:

- Header:** SETUP > OBJECT MANAGER
- Section:** Billing Information
- Left sidebar:** Details, Fields & Relationships (selected), Page Layouts, Lightning Record Pages, Buttons, Links, and Actions, Compact Layouts, Field Sets, Object Limits, Record Types, Related Lookup Filters, Search Layouts, List View Button Layout, Restriction Rules, Scoping Rules.
- Content Area:** Step 2. Enter the details (Step 2 of 4).
 - Field Label:** Amount Swiped
 - Description:** Please enter the length of the number and the number of decimal places. For example, a number with a length of 8 and 2 decimal places can accept values up to "12345678.90".
 - Length:** 18 (Number of digits to the left of the decimal point)
 - Decimal Places:** 0 (Number of digits to the right of the decimal point)
 - Field Name:** Amount_Swiped
 - Help Text:** (empty)
 - Required:** Always require a value in this field in order to save a record
 - Auto add to custom report type:** Add this field to existing custom report types that contain this entry
 - Default Value:** Show Formula Editor
 - Formula Syntax:** Use formula syntax. Enclose text and picklist value API names in double quotes ("the_label"). Include numbers without quotes (21), show percentages as decimals (.01), and express date calculations in the standard format (Today() + 7). To reference a field from a Custom Metadata type record use \$CustomMetadataType__RecordName.FieldName

The screenshot shows the Salesforce Setup interface under Object Manager for the Billing Information object. The left sidebar lists various configuration options like Details, Fields & Relationships, Page Layouts, and Buttons, Links, and Actions. The main content area is titled 'Fields & Relationships' and displays a list of field types with their descriptions:

- Checkbox: Allows users to select a True (checked) or False (unchecked) value.
- Currency: Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.
- Date: Allows users to enter a date or pick a date from a pop-up calendar.
- DateTime: Allows users to enter a date and time, or pick a date from a pop-up calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
- Email: Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
- Geolocation: Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
- Number: Allows users to enter any number. Leading zeros are removed.
Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
- Percent: Allows users to enter any combination of letters and numbers.
- Phone: Allows users to enter any phone number. Automatically formats it as a phone number.
- Picklist: Allows users to select a value from a list you define.
- Picklist (Multi-Select): Allows users to select multiple values from a list you define.
- Text: Allows users to enter up to 255 characters on separate lines.
- Text Area (Long): Allows users to enter up to 131,072 characters on separate lines.
- Text Area (Rich): Allows users to enter formatted text, add images and links. Up to 131,072 characters on separate lines.
- Text (Encrypted): Allows users to enter any combination of letters and numbers and store them in encrypted form.
- Time: Allows users to enter a local time. For example, '-2:40 PM", "14:40", "14:40 00", and "14:40 50 600" are all valid times for this field.
- URL: Allows users to enter any valid website address. When users click on the field, the URL will open in a separate browser window.

The screenshot shows the Salesforce Setup interface under Object Manager for the Billing Information object. A new custom field is being created, with the name 'Total Transactions'. The field details are as follows:

- Field Label:** Total Transactions
- Length:** 18
- Decimal Places:** 0
- Field Name:** Total_Transactions
- Description:** (empty)
- Help Text:** (empty)
- Required:** Always require a value in this field in order to save a record
- Unique:** Do not allow duplicate values
- External ID:** Set this field as the unique record identifier from an external system
- AI Prediction:** Use this field to store AI prediction scores
- Auto add to custom report type:** Add this field to existing custom report types that contain this entry

The screenshot shows the Salesforce Object Manager interface. The left sidebar lists various setup categories like Details, Fields & Relationships, Page Layouts, etc. The main content area is titled "Billing Information" and shows the "Fields & Relationships" tab selected. A large table lists different field types with their descriptions:

Type	Description
Formula	A read-only field that displays the sum, minimum, or maximum value of a field in a related list or the record count of all records listed in a related list.
Roll-Up Summary	Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.
Lookup Relationship	Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where: <ul style="list-style-type: none">The relationship field is required on all detail records.The ownership and sharing of a detail record are determined by the master record.When a user deletes a master record, all detail records are deleted.You can add roll-up summary fields on the master record to summarize the detail records.
Master-Detail Relationship	The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.
External Lookup Relationship	Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.
Checkbox	Allows users to select a True (checked) or False (unchecked) value.
Currency	Allows users to enter a dollar or other currency amount and automatically formats the field as a currency amount. This can be useful if you export data to Excel or another spreadsheet.
Date	Allows users to enter a date or pick a date from a popup calendar.
DateTime	Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
Email	Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
Geolocation	Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
Number	Allows users to enter any number. Leading zeros are removed.
Percent	Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
Phone	Allows users to enter any phone number. Automatically formats it as a phone number.
Picklist	Allows users to select a value from a list you define.

The screenshot shows the "New Custom Field" step in the Salesforce Object Manager. The left sidebar is visible with various setup categories. The main content area is titled "Billing Information" and shows "Step 2. Enter the details". The field is named "Cash Withdrawal" with a length of 18 and 0 decimal places. The "Field Name" is "Cash_Withdrawal". The "Description" and "Help Text" fields are empty. Under "Required", there is a checkbox for "Always require a value in this field in order to save a record". Under "Auto add to custom report type", there is a checkbox for "Add this field to existing custom report types that contain this entity". The "Default Value" field contains the formula editor button "Show Formula Editor".

Formula Fields:

Formula Fields are read only fields. Formula Fields are created to calculate the value of a field based on the data present in other fields.

In this application, In Billing Information object, For the following scenarios, formula field needs to be created:

- Start Date and End Date of the bill should be the start and end date of the month selected from Months picklist.
- Due Date should be bill End Date + 10 days.
- Total Outstanding Amount should be summation of Monthly Card Fees, Charges per transaction*Total Transaction per month, Amount Swiped and Cash Withdrawal.

SETUP > OBJECT MANAGER

Billing Information

Fields & Relationships

Step 1. Choose the field type

Specify the type of information that the custom field will contain.

Data Type

None Selected Select one of the data types below.

Auto Number A system-generated sequence number that uses a display format you define. The number is automatically incremented for each new record.

Formula A read-only field that derives its value from a formula expression you define. The formula field is updated when any of the source fields change.

Roll-Up Summary A read-only field that displays the sum, minimum, or maximum value of a field in a related list or the record count of all records listed in a related list.

Lookup Relationship Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Master-Detail Relationship Creates a specific type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The master field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes the master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.

External Object Creates a relationship that links this object to an external object whose data is stored outside the Salesforce.com.

Step 1 of 5 | **Next** | **Cancel**

SETUP > OBJECT MANAGER

Billing Information

Fields & Relationships

Step 2. Choose output type

Field Label: **Total Outstanding Amount**

Field Name: **Total_Outstanding_Amount**

Auto add to custom report type: Add this field to existing custom report types that contain this entry

Formula Return Type

None Selected Select one of the data types below.

Checkbox Calculate a boolean value
Example: [TODAY() > CloseDate]

Currency Calculate a dollar or other currency amount and automatically format the field as a currency amount.
Example: [Gross Margin = Amount - Cost__c]

Date Calculate a date, for example, by adding or subtracting days to other dates.
Example: [Reminder Date = CloseDate - 7]

Date/Time Calculate a datetime, for example, by adding a number of hours or days to another date/time.
Example: [Next = NOW() + 1]

Number Calculate a numeric value
Example: [Fahrenheit = 1.8 * Celsius + 32]

Percent Calculate a percent and automatically add the percent sign to the number
Example: [Discount = Amount - (Amount * Percentage / 100)]

Step 2 of 5 | **Previous** | **Next** | **Cancel**

Setup | Home | Object Manager

Billing Information

New Custom Field

Step 1. Choose the field type

Specify the type of information that the custom field will contain.

Data Type

None Selected Select one of the data types below.

Auto Number A system-generated sequence number that uses a display format you define. The number is automatically incremented for each new record.

Formula A read-only field that derives its value from a formula expression you define. The formula field is updated when any of the source fields change.

Roll-Up Summary A read-only field that displays the sum, minimum, or maximum value of a field in a related list or the record count of all records listed in a related list.

Lookup Relationship Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Master-Detail Relationship Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes the master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.

External Lookup Relationship The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

Help for this Page

Next | Cancel

Setup | Home | Object Manager

Billing Information

New Custom Field

Step 2. Choose output type

Field Label: Step 2 of 5

Field Name: Previous | Next | Cancel

Add to custom report type Add this field to existing custom report types that contain this entity

Formula Return Type

None Selected Select one of the data types below.

Checkbox Calculate a boolean value
Example: `|TODAY| > CloseDate`

Currency Calculate a dollar or other currency amount and automatically format the field as a currency amount.
Example: `|Gross Margin = Amount - Cost|`

Date Calculate a date, for example, by adding or subtracting days to other dates.
Example: `|Reminder Date = CloseDate - 7|`

Date/Time Calculate a datetime, for example, by adding a number of hours or days to another date/time.
Example: `|Next = NOW| + 1|`

Number Calculate a numeric value
Example: `|Fahrenheit = 1.8 * Celsius_C + 32|`

Percent Calculate a percent and automatically add the percent sign to the number.
Example: `|Commission = (Commission_Amount / TotalAmount) * 100|`

Help for this Page

Step 3. Enter formula

Enter your formula and click Check Syntax to check for errors. Click the Advanced Formula subtab to use additional fields, operators, and functions.

Example: ReminderDate = CloseDate - 7 | [More Examples](#)

Simple Formulas | **Advanced Formula**

Select Field Type: **Insert Field**
Billing Information **Insert Merge Field** | Insert Operator

Start Date (Date) =

```
CALENDAR('January', DATE(YEAR(TODAY())), 1, 1),
"February", DATE(YEAR(TODAY())), 2, 1),
"March", DATE(YEAR(TODAY())), 3, 1),
"April", DATE(YEAR(TODAY())), 4, 1),
"May", DATE(YEAR(TODAY())), 5, 1),
"June", DATE(YEAR(TODAY())), 6, 1),
"July", DATE(YEAR(TODAY())), 7, 1),
"August", DATE(YEAR(TODAY())), 8, 1),
"September", DATE(YEAR(TODAY())), 9, 1),
"October", DATE(YEAR(TODAY())), 10, 1),
"November", DATE(YEAR(TODAY())), 11, 1),
"December", DATE(YEAR(TODAY())), 12, 1),
NULL
```

Quick Tips

- Getting Started
- Operators & Functions

Billing Information

New Custom Field

Step 1. Choose the field type

Specify the type of information that the custom field will contain.

Data Type

None Selected Select one of the data types below.

Formula

Auto Number A system-generated sequence number that uses a display format you define. The number is automatically incremented for each new record.

Roll-Up Summary A read-only field that derives its value from a formula expression you define. The formula field is updated when any of the source fields change.

Lookup Relationship Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Master-Detail Relationship Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user edits the master record, all detail records are deleted.
- You can create roll-up summary fields on the master record to summarize the detail records.

The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

External Lookup Relationship Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.

Help for this Page

Billing Information

New Custom Field

Step 2. Choose output type

Field Label: **End Date**

Field Name: **End_Date**

Add to custom report type: Add this field to existing custom report types that contain this entity.

Formula Return Type

None Selected

Checkbox

Currency

Date

Date/Time

Number

Percent

Calculate a boolean value
Example: `|TODAY| > CloseDate`

Calculate a dollar or other currency amount and automatically format the field as a currency amount.
Example: `Gross Margin = Amount - Cost__c`

Calculate a date, for example, by adding or subtracting days to other dates.
Example: `Reminder Date = CloseDate - 7`

Calculate a datetime, for example, by adding a number of hours or days to another date/time.
Example: `Next = NOW() + 1`

Calculate a numeric value
Example: `Fahrenheit = 1.8 * Celsius__c + 32`

Calculate a percent and automatically add the percent sign to the number
Example: `Percent = (Revenue__c / Revenue__c) * 100`

Billing Information

Enter your formula and click Check Syntax to check for errors. Click the Advanced Formula subtab to use additional fields, operators, and functions.

Example: `Reminder Date = CloseDate - 7` [More Examples](#)

Simple Formula **Advanced Formula**

Select Field Type: **Insert Field**

Insert Operator: **Billing Information**

End Date (Date) =

```
CASE(Months__c,
    "January", DATE(YEAR(TODAY()), 1, 31),
    "February", DATE(YEAR(TODAY()), 2, 28), CASE(MOD(YEAR(TODAY())), 4, 0, 29, 28),
    "March", DATE(YEAR(TODAY()), 3, 31),
    "April", DATE(YEAR(TODAY()), 4, 30),
    "May", DATE(YEAR(TODAY()), 5, 31),
    "June", DATE(YEAR(TODAY()), 6, 30),
    "July", DATE(YEAR(TODAY()), 7, 31),
    "August", DATE(YEAR(TODAY()), 8, 31),
    "September", DATE(YEAR(TODAY()), 9, 30),
    "October", DATE(YEAR(TODAY()), 10, 31),
    "November", DATE(YEAR(TODAY()), 11, 30),
    "December", DATE(YEAR(TODAY()), 12, 31),
    NULL
)
```

Quick Tips

- Getting Started
- Operators & Functions

Billing Information

New Custom Field

Step 1. Choose the field type

Specify the type of information that the custom field will contain.

Data Type

Formula

Select one of the data types below.

- None Selected
- Auto Number
- Formula
- Roll-Up Summary
- Lookup Relationship
- Master-Detail Relationship
- External Lookup Relationship

A system-generated sequence number that uses a display format you define. The number is automatically incremented for each new record.

A read-only field that derives its value from a formula expression you define. The formula field is updated when any of the source fields change.

Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes the master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.

The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

Creates a relationship that links this object to an external object whose data is stored outside the Salesforce org.

Step 1 of 5

Next **Cancel**

Billing Information

New Custom Field

Step 2. Choose output type

Field Label: **Due Date**

Field Name: **Due_Date**

Auto add to custom report type: Add this field to existing custom report types that contain this entity

Formula Return Type

Date

Select one of the data types below.

- None Selected
- Checkbox
- Currency
- Date
- Date/Time
- Number
- Percent

Calculate a boolean value
Example: [TODAY()] > CloseDate

Calculate a dollar or other currency amount and automatically format the field as a currency amount.
Example: [Gross Margin = Amount - Cost_c]

Calculate a date, for example, by adding or subtracting days to other dates.
Example: [Reminder Date = CloseDate - 7]

Calculate a datetime, for example, by adding a number of hours or days to another datetime.
Example: [Next = NOW() + 1]

Calculate a numeric value
Example: [Fahrenheit = 1.8 * Celsius_c + 32]

Calculate a percent and automatically add the percent sign to the number.
Example: [Percentage = (Revenue - TotalCost) / TotalCost * 100]

Step 2 of 5

Previous **Next** **Cancel**

Relationships:

In Credit Card Billing Application, One Customer can have multiple cards and one Card Type (gold, diamond, platinum) can have multiple customers. For this type of scenario, I need to create many to many relationships. In Salesforce, many to many relationships can be achieved by creating a **Junction Object**. In this application, Billing Information is the junction object.

Customer and **Credit Card Master** are **One** sided objects.

Billing Information is the **Many** side object (Junction Object).

Customer and Credit Card **Master Detail Relationship** field will be created Billing Information object.

Billing Information

New Relationship

Step 2. Choose the related object

Select the other object to which this object is related.

Related To: Customer

Help for this Page

Step 2 of 6

Previous Next Cancel

Setup Home Object Manager

SETUP > OBJECT MANAGER

Details Fields & Relationships Page Layouts Lightning Record Pages Buttons, Links, and Actions Compact Layouts Field Sets Object Limits Record Types Related Lookup Filters Search Layouts List View Button Layout Restriction Rules Scoping Rules

Billing Information

New Relationship

Step 3. Enter the label and name for the lookup field

Field Label: Customer

Field Name: Customer

Description:

Help Text:

Child Relationship Name: Billing_Information

Sharing Setting: Select the minimum access level required on the Master record to create, edit, or delete related Detail records.
○ Read Only: Allows users with at least Read access to the Master record to create, edit, or delete related Detail records.
● Read/Write: Allows users with at least Read/Write access to the Master record to create, edit, or delete related Detail records.

Allow reparenting: Child records can be reparented to other parent records after they are created

Auto add to custom report type: Add this field to existing custom report types that contain this entity

Help for this Page

Step 3 of 6

Previous Next Cancel

Setup Home Object Manager

SETUP > OBJECT MANAGER

Details Fields & Relationships Page Layouts Lightning Record Pages Buttons, Links, and Actions Compact Layouts Field Sets Object Limits Record Types Related Lookup Filters Search Layouts List View Button Layout Restriction Rules Scoping Rules

Billing Information

New Custom Field

Step 1. Choose the field type

Specify the type of information that the custom field will contain.

Data Type

Select one of the data types below:

- None Selected
- Auto Number
- Formula
- Roll-Up Summary
- Lookup Relationship
- Master-Detail Relationship
- External Object

A system-generated sequence number that uses a display format you define. The number is automatically incremented for each new record.

A read-only field that derives its value from a formula expression you define. The formula field is updated when any of the source fields change.

A read-only field that displays the sum, minimum, or maximum value of a field in a related list or the record count of all records listed in a related list.

Creates a relationship that links this object to another object. The relationship field allows users to click on a lookup icon to select a value from a popup list. The other object is the source of the values in the list.

Creates a special type of parent-child relationship between this object (the child, or "detail") and another object (the parent, or "master") where:

- The relationship field is required on all detail records.
- The ownership and sharing of a detail record are determined by the master record.
- When a user deletes a master record, all detail records are deleted.
- You can create rollup summary fields on the master record to summarize the detail records.
- The relationship field allows users to click on a lookup icon to select a value from a popup list. The master object is the source of the values in the list.

Creates a relationship that links this object to an external object whose data is stored outside the Salesforce.com

Step 1

Next | Cancel

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Billing Information

New Relationship

Step 2. Choose the related object

Select the other object to which this object is related.

Related To: Credit Card Master

Step 2 of 6

Previous | Next | Cancel

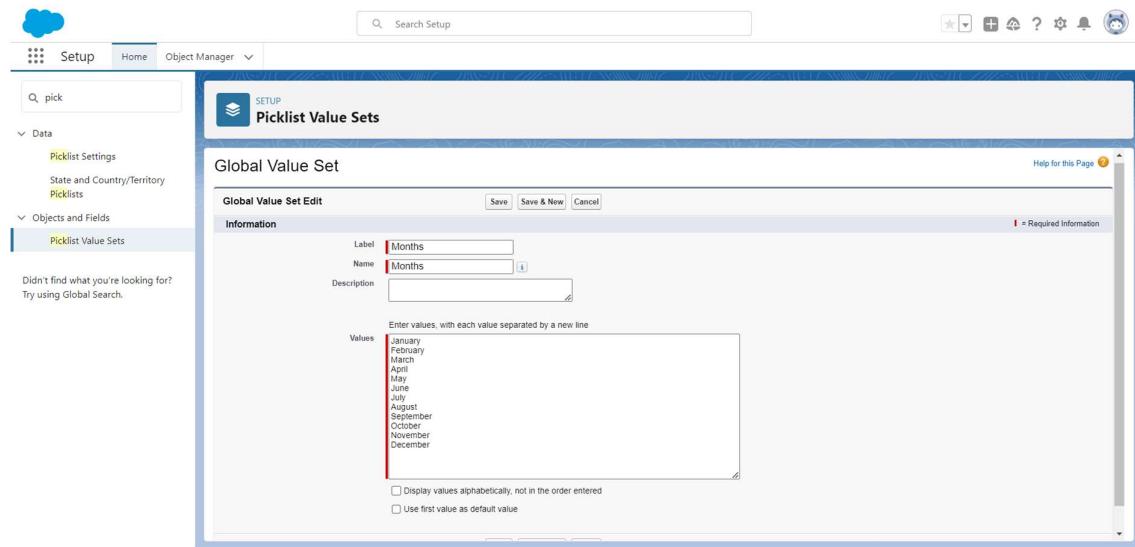
Help for this Page

The screenshot shows the Salesforce Setup interface under the Object Manager. A new relationship is being created between the Billing Information object and the Credit Card Master object. Step 3 of 6 is shown, where the user is entering the label and name for the lookup field. The Field Label is set to "Credit Card Master" and the Field Name is "Credit_Card_Master". The Child Relationship Name is "Billing_Information". Sharing Setting is set to Read/Write. The Values section contains "Gold", "Diamond", and "Platinum".

Global Picklist:

Picklist value sets:

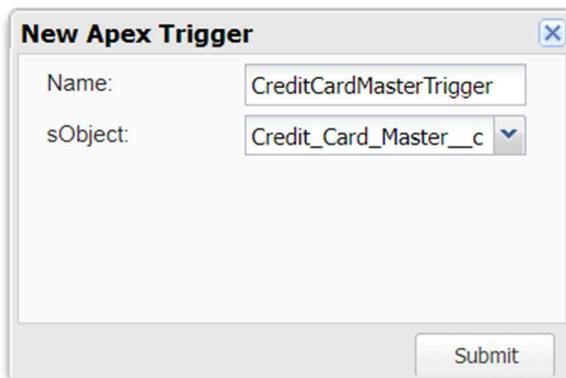
The screenshot shows the Salesforce Setup interface under the Data category. A new Global Value Set is being created, named "Card Type". The Label is "Card Type" and the Name is "Card_Type". The Values section contains "Gold", "Diamond", and "Platinum".



Apex Trigger Implementation:

Apex trigger is a set of Apex code that runs before or after data manipulation language (DML) events.

CreditCardMasterTrigger and **CreditCardMasterTriggerHandler** is created for the scenario: 'If the Credit Card Master - Monthly Card Fees field data is changed by the administrator, comments field on the Credit Card Master object should capture the old monthly fees, before the new value is updated on the record'.

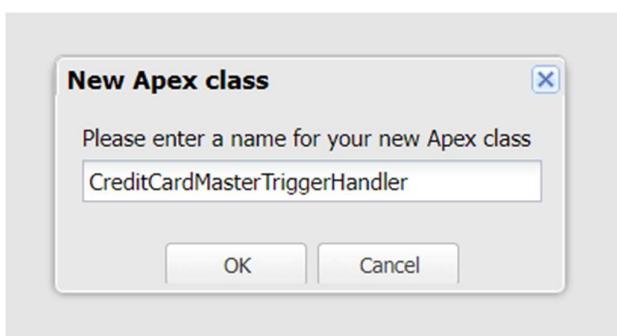


Developer Console - Google Chrome
 https://college13-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

```

trigger CreditCardMasterTrigger on Credit_Card_Master__c (before insert, before update, before delete, after insert,after update, after delete, af
2
3   if(Trigger.isBefore){
4     if(Trigger.isInsert){
5
6     }
7     if(Trigger.isUpdate){
8       system.debug('Field update occurred!');
9       CreditCardMasterTriggerHandler.updateMonthlyCardFeesComments(Trigger.new, Trigger.oldMap);
10    }
11   if(Trigger.isDelete){
12
13   }
14
15   if(Trigger.isAfter){
16     if(Trigger.isInsert){
17
18     }
19     if(Trigger.isUpdate){
20
21     }
22     if(Trigger.isDelete){
23
24
25   }
26
  
```

Logs Tests Checkpoints Query Editor View State Progress Problems



Developer Console - Google Chrome
 https://college13-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

```

public class CreditCardMasterTriggerHandler {
2
3   public static void updateMonthlyCardFeesComments(List<Credit_Card_Master__c> newCards, map<Id, Credit_Card_Master__c> oldCardsMap){
4
5     for(Integer i=0; i<newCards.size(); i++){
6       if(newCards[i].Monthly_Card_Fees__c != oldCardsMap.get(newCards[i].Id).Monthly_Card_Fees__c){
7         if(newCards[i].Comments__c != null){
8           newCards[i].Comments__c = newCards[i].Comments__c + '\nOld Monthly Card Fees: ' + oldCardsMap.get(newCards[i].Id).Monthly_Card_
9         }
10        else{
11          newCards[i].Comments__c = 'Old Monthly Card Fees: '+oldCardsMap.get(newCards[i].Id).Monthly_Card_Fees__c;
12        }
13      }
14    }
15  }
16
  
```

Logs Tests Checkpoints Query Editor View State Progress Problems

Added comments field in Credit Card Master object:

The screenshot shows the Salesforce Setup interface under the Object Manager for the Credit Card Master object. The 'Fields & Relationships' tab is selected. On the left, a sidebar lists various setup categories. The main pane displays a list of field types with their descriptions. The 'Text Area' type is highlighted with a blue selection bar.

Field Type	Description
Date	Allows users to enter a date or pick a date from a popup calendar.
Date/Time	Allows users to enter a date and time, or pick a date from a popup calendar. When users click a date in the pop-up, that date and the current time are entered into the Date/Time field.
Email	Allows users to enter an email address, which is validated to ensure proper format. If this field is specified for a contact or lead, users can choose the address when clicking Send an Email. Note that custom email addresses cannot be used for mass emails.
Geolocation	Allows users to define locations. Includes latitude and longitude components, and can be used to calculate distance.
Number	Allows users to enter any number. Leading zeros are removed.
Percent	Allows users to enter a percentage number, for example, '10' and automatically adds the percent sign to the number.
Phone	Allows users to enter any phone number. Automatically formats it as a phone number.
Picklist	Allows users to select a value from a list you define.
Picklist (Multi-Select)	Allows users to select multiple values from a list you define.
Text	Allows users to enter any combination of letters and numbers.
Text Area	Allows users to enter up to 255 characters on separate lines.
Text Area (Long)	Allows users to enter up to 131,072 characters on separate lines.
Text Area (Rich)	Allows users to enter formatted text, add images and links. Up to 131,072 characters on separate lines.
Text (Encrypted)	Allows users to enter any combination of letters and numbers and store them in encrypted form.
Time	Allows users to enter a local time. For example, "2:40 PM", "14:40", "14:40:00", and "14:40:50.600" are all valid times for this field.
URL	Allows users to enter any valid website address. When users click on the field, the URL will open in a separate browser window.

The screenshot shows the Salesforce Setup interface for creating a new custom field named 'Comments' on the Credit Card Master object. The 'Fields & Relationships' tab is selected. The 'New Custom Field' wizard is open, showing Step 2: Enter the details. The field label and name are both set to 'Comments'. The 'Required' checkbox is unchecked. The 'Default Value' section shows a formula editor with the placeholder: 'Use formula syntax. Enclose text and picklist value API names in double quotes ("The_Text"), include numbers without quotes (12), and percentages decimal (.12). To reference a field from another object, use the field's API name (e.g., Account.Name) or to reference a field from a Custom Metadata type record use :SCustomMetadataType__mdt.RecordName.FieldName'.

The screenshot shows a CRM application interface for 'Credit Card Billing'. The main title bar includes 'Credit Card Billing', 'Customers', 'Credit Card Master', and 'Billing Information'. A search bar at the top right contains the placeholder 'Search...'. The top navigation bar features icons for star, plus, document, question, gear, and bell.

The main content area displays a record for a 'Credit Card Master' named 'Diamond'. The 'Details' tab is selected. Key fields shown include:

- Credit Card Master Name: Diamond
- Monthly Card Fees: ₹300
- Card Limit: ₹10,000.00
- Charges Per Transaction: ₹200
- Comments: (empty)

Below these fields are 'Created By' (Sanchi Garg, 09/12/2023, 7:36 pm) and 'Last Modified By' (Sanchi Garg, 09/12/2023, 8:58 pm).

To the right of the details is an 'Activity' section with a toolbar for filtering and viewing. It shows a message: 'No activities to show. Get started by sending an email, scheduling a task, and more.' Below this is another message: 'No past activity. Past meetings and tasks marked as done show up here.'

This screenshot is identical to the one above, except for the value in the 'Monthly Card Fees' field, which has been changed to ₹350.

This screenshot is identical to the previous ones, except for the values in the 'Monthly Card Fees' and 'Old Monthly Card Fees' fields, which have been updated to ₹400.

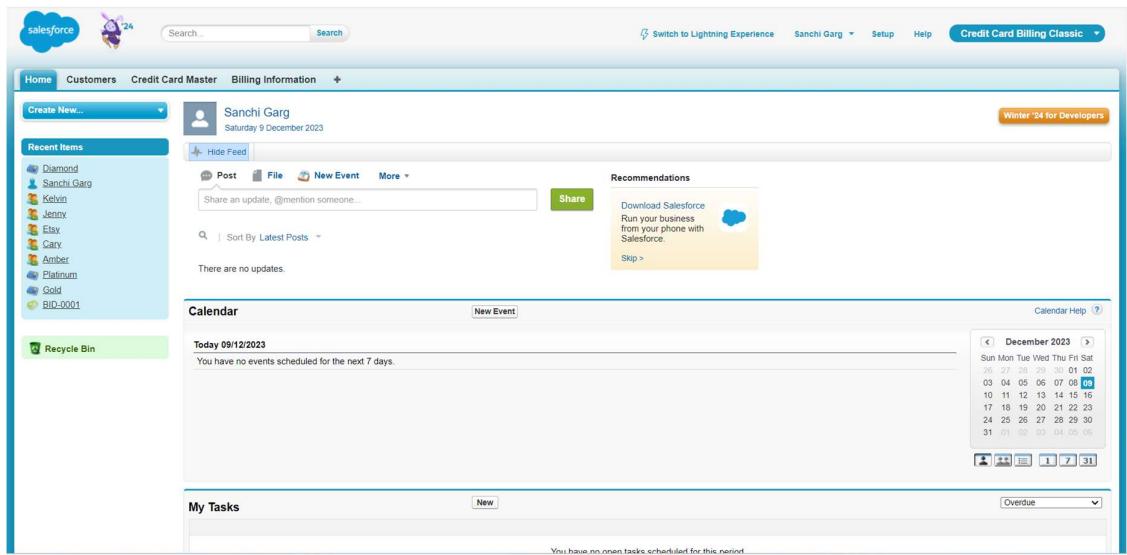
Visualforce Page Creation:

Visualforce is Markup language that allows you to describe the User Interface which can live on your Salesforce Platform. Visualforce pages consist of two elements: Visualforce markup, and a controller. It is also used to create VF Tabs.

To create the Visualforce tab, firstly, I need to create a classic custom application **Credit Card Billing Classic** by switching to Salesforce Classic platform.

This screenshot shows the 'Step 2. Enter the Details' page of the 'New Custom App' wizard. The page title is 'New Custom App' and the sub-section title is 'Step 2 of 5'. The left sidebar includes links for Lightning Experience Transition Assistant, Salesforce Mobile Quick Start, Home, and Administer (with sub-links like Release Updates, Manage Users, Manage Apps, etc.). The main form has sections for 'Custom App Information' and 'Step 2 of 5'. In the 'Custom App Information' section, there are fields for 'App Label' (set to 'Credit Card Billing Classic'), 'App Name' (set to 'Credit_Card_Billing_Classic'), and 'Description' (empty). A note at the bottom right indicates that 'I = Required Information'. Navigation buttons at the bottom right include 'Previous', 'Next', and 'Cancel'.

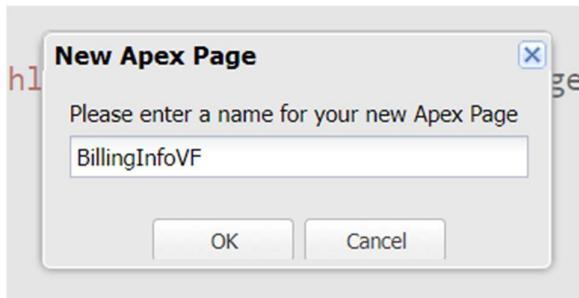
This screenshot shows the 'Step 4. Choose the Tabs' page of the 'New Custom App' wizard. The page title is 'New Custom App' and the sub-section title is 'Step 4 of 5'. The left sidebar is identical to the previous screenshot. The main form has sections for 'Available Tabs' (listing items like Web Store Inventory Sources, Work Orders, etc.) and 'Selected Tabs' (listing items like Home, Customers, Credit Card Master, Billing Information). Between these lists are 'Add' and 'Remove' buttons. Below the tabs is a 'Default Landing Tab' dropdown set to 'Home'. Navigation buttons at the bottom right include 'Previous', 'Next', and 'Cancel'.



Created Visualforce page and the Controller apex class for the following scenarios:

Scenario 1:

Create a Visualforce page AND Apex Class with input of credit card number and output of the corresponding bills for various months.



The screenshot shows the Salesforce Lightning Experience Transition Assistant interface. On the left, there's a sidebar with links like 'Home', 'Customers', 'Credit Card Master', 'Billing Information', and 'Get Started'. The main area is titled 'New Visualforce Tab' and contains a form for 'Step 1. Enter the Details'. It asks to choose a page for the new tab and provides fields for 'Visualforce Page' (set to 'BillingInfoVF [BillingInfoVF]'), 'Tab Label' ('Billing Info VF'), 'Tab Name' ('Billing_Info_VF'), and 'Tab Style' (set to 'Mail'). Below these, there's a note about a splash page custom link and a 'Description' field with a placeholder box. At the bottom right are 'Next' and 'Cancel' buttons.

The screenshot shows the Developer Console in Google Chrome. The URL is https://college13-dev-ed-develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage. The code editor displays the following Apex code for 'BillingInfoVF.vfp':

```
1 <apex:page sidebar="false">
2   <div style='border: 5px solid black; font-size:20px; text-align:center; padding: 10px'>
3     Welcome to the Billling Info VisualForce Page!!
4   </div>
5 </apex:page>
```

The screenshot shows the Salesforce Lightning Experience. The top navigation bar includes 'Switch to Lightning Experience', 'Sanchi Garg', 'Setup', 'Help', and 'Credit Card Billing Classic'. The main content area has tabs for 'Home', 'Customers', 'Credit Card Master', 'Billing Information', and the newly created 'Billing Info VF'. A large message box in the center says 'Welcome to the Billing Info VisualForce Page!!'. At the bottom, there's a copyright notice: 'Copyright © 2000-2023 salesforce.com, inc. All rights reserved | Privacy Statement | Security Statement | Terms of Use | 508 Compliance | Go to Salesforce mobile app'.

The screenshot shows the Salesforce Developer Console in Google Chrome. The URL is https://college13-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage. The tab bar includes courseTriggerHandler.apxc, HelloWorldVf.vfp, HelloWorldController.apxc, CreditCardMasterTrigger.apxc, CreditCardMasterTriggerHandler.apxc, BillingInfoVF.vfp (selected), BillingInfoController.apxc, ListOfBills.vfp, and ListOfBillsController.apxc. The API Version is set to 59. The code editor displays the following Apex Visualforce page code:

```
1 <apex:page sidebar="false" controller="BillingInfoController">
2
3     <div style='border: 2px solid black; font-size:20px; text-align:center; padding: 10px; margin-bottom: 2px'>
4         Welcome to the Billing Info VisualForce Page!!
5     </div>
6
7     <apex:form>
8         <apex:pageBlock title="Bill Information">
9             <apex:pageBlockSection title="Credit Card Bill Info" columns="1">
10                <label>Credit Card Number:</label>
11                <apex:inputText value="{!creditCardNo}"></apex:inputText>
12            </apex:pageBlockSection>
13
14            <apex:pageBlockButtons >
15                <apex:commandButton value="Search" action="{!generateBills}"></apex:commandButton>
16            </apex:pageBlockButtons>
17        </apex:pageBlock>
18    </apex:form>
19
20    <apex:pageBlock rendered="{!!showBills}">
21        <apex:pageBlockTable value="{!!Records}" var="Record">
22            <apex:column value="{!!Record.Name}"></apex:column>
23            <apex:column value="{!!Record.Customer__c}"></apex:column>
24            <apex:column value="{!!Record.Credit_Card_Master__c}"></apex:column>
25            <apex:column value="{!!Record.Credit_Card_Number__c}"></apex:column>
26            <apex:column value="{!!Record.Months__c}"></apex:column>
27            <apex:column value="{!!Record.Total_Outstanding_Amount__c}"></apex:column>
28            <apex:column value="{!!Record.Due_Date__c}"></apex:column>
29        </apex:pageBlockTable>
30    </apex:pageBlock>
31
32 </apex:page>
33
34
35
```

The tabs at the bottom of the developer console are Logs, Tests, Checkpoints, Query Editor, View State, Progress, and Problems (selected). The Problems tab shows no errors.

This screenshot shows the same developer console environment as the first one, but with additional code added to the BillingInfoVF.vfp page. The code now includes a pageBlock rendered condition and a pageBlockTable section. The tabs at the bottom remain the same, with Problems selected.

```
14
15     <apex:pageBlockButtons >
16         <apex:commandButton value="Search" action="{!generateBills}"></apex:commandButton>
17     </apex:pageBlockButtons>
18
19     <apex:pageBlock>
20
21         <apex:pageBlock rendered="{!!showBills}">
22             <apex:pageBlockTable value="{!!Records}" var="Record">
23                 <apex:column value="{!!Record.Name}"></apex:column>
24                 <apex:column value="{!!Record.Customer__c}"></apex:column>
25                 <apex:column value="{!!Record.Credit_Card_Master__c}"></apex:column>
26                 <apex:column value="{!!Record.Credit_Card_Number__c}"></apex:column>
27                 <apex:column value="{!!Record.Months__c}"></apex:column>
28                 <apex:column value="{!!Record.Total_Outstanding_Amount__c}"></apex:column>
29                 <apex:column value="{!!Record.Due_Date__c}"></apex:column>
30             </apex:pageBlockTable>
31         </apex:pageBlock>
32     </apex:pageBlock>
33
34 </apex:page>
35
```



Developer Console - Google Chrome

File • Edit • Debug • Test • Workspace • Help • < >

courseTriggerHandler.apxc | HelloWorldVF.vfp | HelloWorldController.apxc | CreditCardMasterTrigger.apxc | CreditCardMasterTriggerHandler.apxc | BillingInfoVF.vfp | **BillingInfoController.apxc** | ListOfBills.vfp | ListOfBillsController.apxc

Code Coverage: None • API Version: 59

```

1 public class BillingInfoController {
2
3     public Decimal creditCardNo {get;set;}
4     public List<Billing_Information__c> Records {get;set;}
5     public Boolean showBills { get; set; }
6
7     public BillingInfoController(){
8         Records = new List<Billing_Information__c>();
9         showBills = false;
10    }
11
12    public void generateBills(){
13        Records = [SELECT Name, Credit_Card_Number__c, Customer__c, Credit_Card_Master__c, Total_Outstanding_Amount__c, Months__c,
14                    Due_Date__c FROM Billing_Information__c WHERE Credit_Card_Number__c = :creditCardNo];
15
16        showBills = true;
17    }
18 }
```

Logs Tests Checkpoints Query Editor View State Progress **Problems**

Name Line Problem

Welcome to the Billing Info VisualForce Page!!

Bill Information

Credit Card Bill Info

Credit Card Number:

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Welcome to the Billing Info VisualForce Page!!

Bill Information

Credit Card Bill Info

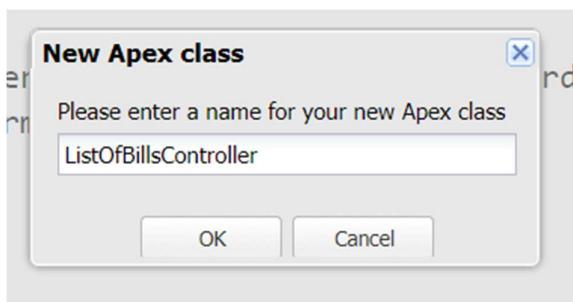
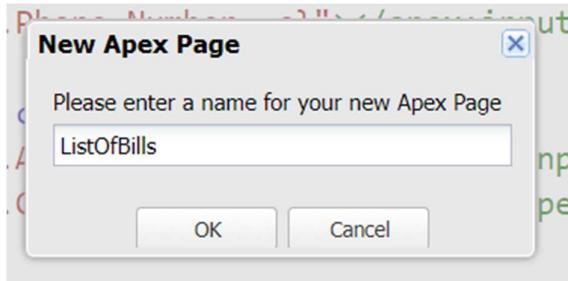
Credit Card Number:

Billing ID	Customer	Credit Card Master	Credit Card Number	Months	Total Outstanding Amount	Due Date
BID-0002	Cary	Diamond	2244335544	February	\$1,010	10/03/2023
BID-0008	Cary	Gold	2244335544	March	\$7,920	10/04/2023

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Scenario 2:

Display all the Billing information (List of Bills) in a tabular format via a VF Page a. Create a custom visualforce tab to view the VF page.



New Visualforce Tab

Step 1. Enter the Details

Choose the page for this new tab. Fill in other details.

Select an existing page or [create a new page now](#)

Visualforce Page: ListOfBills [ListOfBills]

Tab Label: List Of Bills VF

Tab Name: List_Of_Bills_VF

Tab Style: Bridge

(Optional) Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.

Splash Page Custom Link:

Enter a short description.

Description:

Help for this Page

Step 1 of 3

Next Cancel

Developer Console - Google Chrome

https://college13-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

```

1 <apex:page sidebar="false" controller="ListOfBillsController">
2   <div style='border: 2px solid black; font-size:20px; text-align:center; padding: 10px; margin-bottom: 2px'>
3     Welcome to the Billing Info VisualForce Page!!
4   </div>
5   <apex:pageBlock title="List of Bills">
6     <apex:pageBlockTable value="{!billingRecords}" var="Record">
7       <apex:column value="{!Record.Name}"></apex:column>
8       <apex:column value="{!Record.Customer__c}"></apex:column>
9       <apex:column value="{!Record.Credit_Card_Master__c}"></apex:column>
10      <apex:column value="{!Record.Credit_Card_Number__c}"></apex:column>
11      <apex:column value="{!Record.Months__c}"></apex:column>
12      <apex:column value="{!Record.Total_Outstanding_Amount__c}"></apex:column>
13      <apex:column value="{!Record.Due_Date__c}"></apex:column>
14   </apex:pageBlockTable>
15 </apex:pageBlock>
16
17 </apex:page>

```

Logs Tests Checkpoints Query Editor View State Progress Problems

Name Line Problem

Developer Console - Google Chrome

https://college13-dev-ed.develop.my.salesforce.com/_ui/common/apex/debug/ApexCSIPage

```

File Edit Debug Test Workspace Help < >
courseTriggerHandler.apxc HelloWorldVF.vfp HelloWorldController.apxc CreditCardMasterTriggerHandler.apxc CreditCardMasterTriggerHandler.apxc BillingInfoVF.vfp BillingInfoController.apxc * ListOfBills.vfp ListOfBillsController.apxc
Code Coverage: None API Version: 59 Go To
1 public class ListOfBillsController {
2
3   public List<Billing_Information__c> billingRecords {get;set;}
4
5   public ListOfBillsController(){
6     billingRecords = new List<Billing_Information__c>();
7     getRecords();
8   }
9
10  public void getRecords(){
11    billingRecords = [SELECT Name, Credit_Card_Number__c, Customer__c, Credit_Card_Master__c, Total_Outstanding_Amount__c, Months__c,
12                      Due_Date__c FROM Billing_Information__c];
13
14  }
15
16 }

```

Logs Tests Checkpoints Query Editor View State Progress Problems

Name Line Problem

salesforce 24 Search... Search Switch to Lightning Experience Sanchi Garg Setup Help Credit Card Billing Classic

Home Customers Credit Card Master Billing Information Billing Info VF List Of Bills VF +

Welcome to the VisualForce Page!!						
List of Bills						
Billing ID	Customer	Credit Card Master	Credit Card Number	Months	Total Outstanding Amount	Due Date
BID-0002	Cary	Diamond	2,24,43,35,544	February	\$1,010	10/03/2023
BID-0003	Elsy	Platinum	1,12,23,34,455	April	\$1,708	10/05/2023
BID-0001	John	Gold		January	\$702	10/02/2023
BID-0006	Cary	Platinum	2,23,34,45,566	December	\$6,760	10/01/2024
BID-0009	Kelvin	Gold	2,24,43,35,544	March	\$1,408	10/04/2023
BID-0004	Amber	Diamond	2,23,34,45,566	October	\$8,010	10/11/2023
BID-0005	Kelvin	Gold	1,12,23,34,455	June	\$6,910	10/07/2023
BID-0007	Jenny	Diamond	2,24,43,35,544	August	\$5,510	10/09/2023
BID-0008	Cary	Gold	2,24,43,35,544	March	\$7,920	10/04/2023

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