



# **FIELD SERVICE WORKORDER OPTIMIZATION**

## Report

Prepared by  
Cheerla Vamshi  
[cheerlavamshi15@gmail.com](mailto:cheerlavamshi15@gmail.com)  
MallaReddy University

# **PROJECT ABSTRACT**

The Field Service Workorder Optimization project aims to enhance the efficiency and effectiveness of managing field service operations. By implementing automated scheduling systems, the project ensures work orders are prioritized and assigned based on technician availability, skills, and proximity, thereby reducing downtime and travel time. Real-time data integration and GPS tracking provide technicians with up-to-date information and directions, facilitating seamless communication with the back office. An intuitive user interface allows technicians to easily access and update job details, while managers benefit from dashboards displaying key performance metrics. This optimization not only increases operational efficiency and reduces costs but also improves customer satisfaction by ensuring timely and high-quality service delivery. Overall, the project leverages technology and data analytics to streamline field service management, resulting in significant improvements in resource utilization and service outcomes.

## **INTRODUCTION**

Efficient management of field service operations is crucial for organizations aiming to provide timely and high-quality service to their customers. The Field Service Workorder Optimization project addresses this need by leveraging advanced scheduling algorithms, real-time data integration, and intelligent resource allocation. In an industry where minimizing downtime, reducing travel time, and enhancing customer satisfaction are paramount, this project seeks to streamline the process of managing and executing work orders. By incorporating technology and data-driven strategies, the project aims to transform traditional field service management, ensuring optimal use of resources and improved service outcomes.

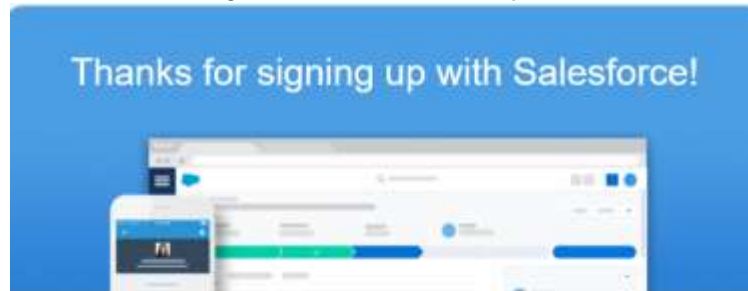
# CONTENTS

S.NO	TOPIC	Pg.No
1	SalesForce - Creating Developer Account - Account Activation	4
2	Object - Create Technician Object - Create WorkOrder Object - Create Assignment Object	4-5
3	Tabs - Create a Custom Tab	6
4	The Lightning App - Create Lightning App	6-7
5	Fields & Relationships - Creating a lookup field in Assignment Object - Manage your Picklist Values - Creating Formula field in WorkOrder Object	8-9
6	Profiles - Technician Profile	10
7	Users - Create User	10
8	Apex Trigger - Create Apex Classes - Create Triggers	11-13
9	Reports & Dashboards - Create Reports - Create Dashboards	13-14

# 1. Salesforce

-**Creating Developer Account** : Created a developer organization in salesforce platform by filling all the relevant details.

- **Account Activation** : Then I have got the mail, verified my account, and set up a password.

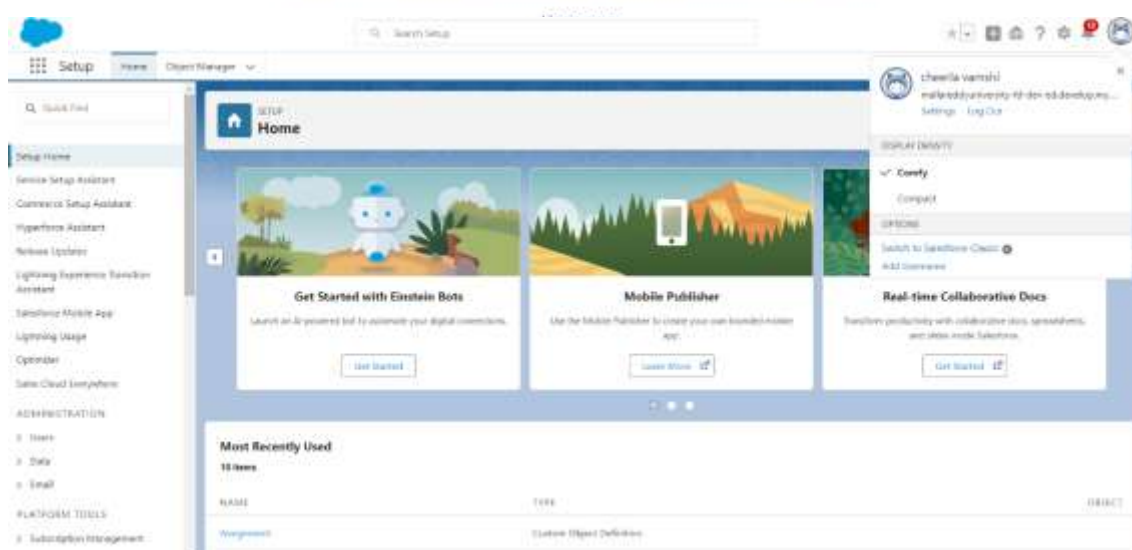


Click below to verify your account.

Verify Account

To easily log in later, save this URL:

<https://mallareddyuniversity-fd-dev-ed.develop.my.salesforce.com>



# 2. Object

-**Create Technician Object** : After downloading the given Technician spreadsheet, create custom object from spreadsheet, upload the technician.csv file and import the data as shown.

-**Create WorkOrder Object** : Same steps to be followed for work order object, here we no need to import the data as shown in the steps.

-**Create Assignment Object** : Creating a custom object with the label name as Assignment and enter the details, then save.

Create a custom object from a spreadsheet

Define object and fields

Choose the data source, map fields and their types, and select field data

CSV File Details

Encoding: **UTF-8** | Header: **Separated by** | **Comma** | First Line: **Source** | Rows: **Start with only** | **1** | Field: **Custom field** | Import: **5 rows of data** | No. data imports: **1** | Row: **Import data** | Last Selected: **Create a default record**

Record 7 of 7 to import | View mapped fields

IMPORT FILE FIELD NAME	MAPPING FIELD NAME	MAPPING FIELD TYPE	ADD TO LAYOUT	FIELD PREVIEW
✓ Technician ID	Technician ID	Text	<input type="checkbox"/>	72011
✓ Name	Name	Text	<input type="checkbox"/>	John
✓ Photo	Photo	Photo	<input type="checkbox"/>	Photo (URL)
✓ Email	Email	Email	<input type="checkbox"/>	john@peter.com
✓ Location	Location	Multiple	<input type="checkbox"/>	Hollywood
✓ Gender	Gender	Multiple	<input type="checkbox"/>	Female
✓ Role	Role	Multiple	<input type="checkbox"/>	Electrician Installation

Next

Create a custom object from a spreadsheet

### Define object and fields

Choose the data source, map fields to object types, and import their data

**CSV File Details**

Existing Name: 
 Select Source Type: 
 Data Load Source: 
 Data Load Size: 
 Import & Refresh on Click: ☒
 Refresh Name:

**Field 7 of 7 to Import** View Imported Fields

IMPORT FIELD NAME	SELECTED FIELD NAME	SELECTED FIELD TYPE	USE FOR LOOKUPS	FIELD POSITION
✓ WorkOrder ID	WorkOrder ID	Text	<input type="checkbox"/>	1 (ID)
✓ Email	Email	Email	<input checked="" type="checkbox"/>	2
✓ Service Type	Service Type	Text	<input type="checkbox"/>	3
✓ Description	Description	Text	<input type="checkbox"/>	4
✓ Location	Location	Phone	<input checked="" type="checkbox"/>	5
✓ Priority	Priority	Phone	<input checked="" type="checkbox"/>	6
✓ Status	Status	Phone	<input checked="" type="checkbox"/>	7

Back Next

## Assignment

Custom Object Definition Edit

Save

Save & New

Cancel

Custom Object Information

The **label** and **plural label** are used in tabs, page layouts, and reports. Be careful when changing the name or label as it may affect existing integrations and merge templates.

Label

Assignment

Example: Account

Plural Label

Assignments

Example: Accounts

Starts with a case record

☐

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

Object Name

Assignment

Example: Account

Description

Default Developer Help Linking

☒ Open the standard Salesforce.com Help & Training window

☐ Open a window using a Visualforce page

Custom Name

Account - 50%

Enter Record Name Label and Format

The **Record Name** appears in page layouts, key lists, related lists, lookups, and search results. For example, the **Record Name** for **Account** is "Account Name" and for **Case** it is "Case Number". Note that the **Record Name** field is always called "Name" when referenced via the API.

Record Name

Assignment

Example: Account Name

Date Type

Auto Number

Warning: If you plan to insert a high volume of records in this object, via the API for example, use the Text date type.

Display Format

A-0000

Example: A-0000 What's This?

### 3. Tabs

- **Creating a Custom Tab** : Select the Tabs option in Quick find box and create new tab named Assignment.

The screenshot shows the 'Edit Custom Object Tab' page for 'Assignments'. The page has a header with 'SETUP' and 'Tabs'. Below the header, it says 'Edit Custom Object Tab: Assignments' and 'Fill in the fields below to define the custom tab.' The main section is 'Custom Tab Definition Edit'. Under 'Custom Object Tab Information', there are fields for 'Tab Label' (Assignments), 'Object' (Assignment), and 'Tab Style' (Cell phone). Below this, there is an optional section for 'Choose a Home Page Custom Link to show as a splash page the first time your users click on this tab.' with a 'Splash Page Custom Link' dropdown set to '--None--'. At the bottom, there is a 'Description' field.

- By default, Technician and WorkOrder tabs will be created once the custom object is created.

#### Custom Tabs

You can create new custom tabs to extend Salesforce functionality or to build new application functionality.

Custom Object tabs look and behave like the standard tabs provided with Salesforce. Web tabs allow you to embed external web applications and content within the Salesforce window. Visualforce tabs allow you to embed Visualforce pages. Lightning Component tabs allow you to add Lightning components to the navigation menu in Lightning Experience and the mobile app. Lightning Page tabs allow you to add Lightning Pages to Lightning Experience and the mobile app.

The screenshot shows a table titled 'Custom Object Tabs' with columns: Action, Label, Tab Style, and Description. There are three rows of tabs: 'Assignments' (Cell phone style), 'Technician' (Box style), and 'WorkOrder' (Box style). Each row has 'Edit' and 'Del' links in the Action column.

Action	Label	Tab Style	Description
<a href="#">Edit</a>   <a href="#">Del</a>	<a href="#">Assignments</a>	Cell phone	
<a href="#">Edit</a>   <a href="#">Del</a>	<a href="#">Technician</a>	Box	
<a href="#">Edit</a>   <a href="#">Del</a>	<a href="#">WorkOrder</a>	Box	

### 4. The Lightning App

-**Create a Lightning App** : Again, in quick find box, go to app manager and create new lightning app with the name of project and some further details.

- Add Navigation Items (i.e, Home, WorkOrder, Assignments, Technician, Reports and Dashboards)
- Add User Profile (i.e, System Administrator)
- Then click save and finish

### 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 ⓘ  
Field Service WorkOrder Optimization

\*Developer Name ⓘ  
Field\_Service\_WorkOrder\_Optimization

Description ⓘ  
Give a meaningful description image

#### App Branding

Image ⓘ  




Primary Color Hex Value ⓘ  
 #0070C2

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

**FIG 4.1: Create Lightning App**

### Navigation Items

Choose the items to include in the app, and arrange the order in which they appear. Users can personalize the navigation to add or move items, but users can't remove or rename the items that you add. Some navigation items are available only for phone or only for desktop. These items are dropped from the navigation bar when the app is viewed in a format that the item doesn't support.

Available Items ⓘ   Create

Type to filter list...

- Accounts
- All Sites
- Alternative Payment Methods
- Analytics
- App Launcher
- Appointment Categories
- Appointment Invitations
- Archived Opportunities

Selected Items

- Home
- WorkOrder
- Assignments
- Technician
- Reports
- Dashboards

**FIG 4.2 : Add Navigation Items**

### User Profiles

Choose the user profiles that can access this app.

Available Profiles ⓘ

Type to filter list...

- Analytics Cloud Integration User
- Analytics Cloud Security User
- Authenticated Website

Selected Profiles ⓘ

- System Administrator

**FIG 4.3 Add User Profile**

## 5) Fields & Relationships

- **Creating Lookup Field In Assignment Object** : In Assignment go to Fields & Relationships and create a new field labeled as WorkOrder and datatype as Lookup.

The screenshot shows the 'Assignment' object configuration in SAP S/4HANA. The 'Fields & Relationships' tab is active. Under 'Custom Field Definition Detail', a new field 'WorkOrder ID' is being defined with a 'Lookup' data type. The 'Lookup Options' section shows the field is linked to the 'WorkOrder' object.

- **Manage your Picklist Values** : In Object Manager select WorkOrder object go to fields & relationships. In that location field add new values (i.e, Nasik, Warangal, Nand

The screenshot shows the 'WorkOrder' object configuration in SAP S/4HANA. The 'Fields & Relationships' tab is active. The 'Values' section shows a table with columns for Action, Value, API Name, Default, Chart Colors, and Modified By. The table contains three rows of values: 'Value1', 'High', and 'Nasik'.

- Add more values in the fields of priority(i.e, High) and Service type(i.e, Hardware repair, Troubleshoot/Debugging, Lane-Management).

Values					
<a href="#">New</a> <a href="#">Reorder</a> <a href="#">Replace</a> <a href="#">Printable View</a> <a href="#">Chart Colors</a>					
<a href="#">Delete Selected</a> <a href="#">Deactivate Selected</a> <a href="#">Reenable Selected</a>					
<input type="checkbox"/> Action	Values	API Name	Default	Chart Colors	Modified By
<input type="checkbox"/> Edit   Del   Deactivate	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 9:29 pm
<input type="checkbox"/> Edit   Del   Deactivate	High	High	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 10:43 pm

**FIG 5.1 Priority Field**



Values					
<a href="#">New</a> <a href="#">Reorder</a> <a href="#">Replace</a> <a href="#">Printable View</a> <a href="#">Chart Colors</a>					
<a href="#">Delete Selected</a> <a href="#">Deactivate Selected</a> <a href="#">Replace Selected</a>					
Action	Values	API Name	Default	Chart Colors	Modified By
<a href="#">Edit</a>   <a href="#">Del</a>   <a href="#">Deactivate</a>	Value1	Value1	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 9:29 pm
<a href="#">Edit</a>   <a href="#">Del</a>   <a href="#">Deactivate</a>	Hardware repair	Hardware repair	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 10:14 pm
<a href="#">Edit</a>   <a href="#">Del</a>   <a href="#">Deactivate</a>	Troubleshoot/Debugging	Troubleshoot/Debugging	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 10:14 pm
<a href="#">Edit</a>   <a href="#">Del</a>   <a href="#">Deactivate</a>	Lane-Management	Lane-Management	<input type="checkbox"/>	Assigned dynamically	cheerla.varada 19/10/2024, 10:14 pm

**FIG 5.2 Service Type Field**

**- Creating Formula Field in WorkOrder Object:** Now create a Formula Datatype and give the field label as "date". The formula is "CreateDate".

The screenshot shows the 'Field Definition' interface for a new field named 'Date'. The 'Field Name' is 'Date'. The 'Data Owner' is 'User'. The 'Field Type' is 'Date'. The 'Formula Options' section shows the 'Formula Return Type' as 'Date'. The 'Formula' field contains the text 'CreateDate'. The 'Available' and 'Chosen' lists show 'PII', 'HIPAA', 'GDPR', and 'PCI'.

- Now, in the Assignment object, create a Formula Datatype in Fields & relationships. Add Technician ID with return type Date.

The screenshot shows the 'Field Definition' interface for a new field named 'Technician ID'. The 'Field Name' is 'Technician ID'. The 'Data Owner' is 'User'. The 'Field Type' is 'Date'. The 'Formula Options' section shows the 'Formula Return Type' as 'Date'. The 'Formula' field contains the text 'WorkOrder\_ID\_r.CreatedDate'. The 'Available' and 'Chosen' lists show 'PII', 'HIPAA', 'GDPR', and 'PCI'.

- Add Assignment Date with Formula with return type date (WorkOrder\_ID\_r.Date\_c).
- Add Completion Date with Formula with return type date " IF(ISPICKVAL( WorkOrder\_ID\_r.Status\_c , 'Resolved'), WorkOrder\_ID\_r.LastModifiedDate , NULL)"

## 6. Profiles

- **Technician Profile** : To create a new profile in Salesforce, navigate to Setup, type "Profiles" in the Quick Find box, and select "Profiles." Click "New Profile," choose "Standard Platform User" as the existing profile, name it "Technician," and click "Save." On the profile page, click "Edit." Scroll to Custom Object Permissions and grant Read-only access for Technician, WorkOrder, and Assignment objects, then click "Save." On the profile detail page, scroll to Custom Field-Level Security, click "View" next to the

The screenshot shows the 'Profile Edit' page for the 'Standard Platform User' profile. The page title is 'Standard Platform User' with a subtitle 'Set the permissions and page layouts for this profile.' Below the title, there are buttons for 'Save', 'Save & New', and 'Cancel'. The 'Name' is 'Standard Platform User' and the 'User License' is 'Salesforce Platform'. There is a 'Custom Profile' checkbox which is currently unchecked. The 'Custom App Settings' section is visible, showing a table with columns for 'Visible' and 'Default' for various apps. The table includes rows for 'Analytics Studio (standard\_\_Insights)', 'App Launcher (standard\_\_AppLauncher)', 'Field Service WorkOrder Optimization (Field\_Service\_WorkOrder\_Optimization)', 'Platform (standard\_\_Platform)', and 'WDC (standard\_\_Work)'. The 'Platform' row has both 'Visible' and 'Default' checkboxes checked. A red banner at the bottom of the table indicates 'Required Information'.

## 7. Users

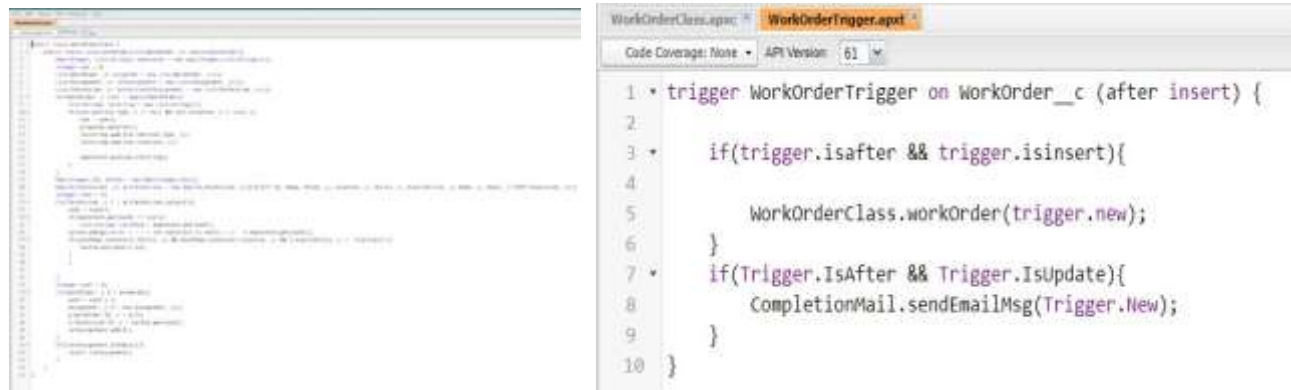
- **Create User** : Go to User and create a new one with new name and other details such as last-name, alias, email, username, nickname, user license, and profile.

The screenshot shows the 'User Edit' page for the user 'Elina Gilbert'. The page title is 'User Edit' with a subtitle 'Set the permissions and page layouts for this user.' Below the title, there are buttons for 'Save', 'Save & New', and 'Cancel'. The 'General Information' section is visible, showing a form with fields for 'First Name', 'Last Name', 'Alias', 'Email', 'Username', 'Nickname', 'Title', 'Company', 'Department', and 'Division'. The 'First Name' field is highlighted with a red box. To the right of the form, there are dropdown menus for 'Role' (set to '<None Specified>'), 'User License' (set to 'Salesforce Platform'), and 'Profile' (set to 'Technician'). There are also checkboxes for 'Active', 'Marketing User', 'Offline User', 'Knowledge User', 'Flow User', 'Service Cloud User', 'Site.com Contributor User', 'Site.com Publisher User', 'WDC User', and 'Data.com Monthly Addition User'. A red banner at the bottom of the form indicates 'Required Information'.

## 8. Apex Trigger

**-Create Apex Class :** To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "WorkOrderClass" and click "OK."

**-Create Apex Trigger :** To create a new Apex Trigger in Salesforce, open the Developer Console, click on "File," then "New," and select "Apex Trigger." Name the trigger "WorkOrderTrigger" and select "WorkOrder\_c" from the sObject dropdown. Click "Submit" to create the trigger.



**FIG 8.1 WorkOrder Apex Class and Trigger Code**

**-Create Apex Class :** To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "AssigningEmail" and click "OK."

**-Create Apex Trigger :** To create a new Apex Trigger in Salesforce, open the Developer Console, click on "File," then "New," and select "Apex Trigger." Name the trigger "AssignmentTrigger" and select "WorkOrder\_c" from the sObject dropdown. Click "Submit" to create the trigger.

```

1 //add the logMessage()
2 public void addEmailMsg(LogMessage__c email)
3 {
4     List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
5     List<String> sendTo = new List<String>();
6     for(LogMessage__c logMsg : email.logMsgs)
7     {
8         for(LogMessage__c con : logMsg.logMsgs)
9         {
10             messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
11             List<String> sendTo = new List<String>();
12             mail.setToAddresses(sendTo);
13             mail.setSubject(logMsg.subject);
14             mail.setBody(logMsg.body);
15             mail.setHTMLBody(logMsg.htmlBody);
16             myVar.add(mail);
17         }
18     }
19     Messaging.sendEmail(myVar);
20 }
21
22 //trigger on WorkOrder__c
23 trigger WorkOrder__c on WorkOrder__c (after insert) {
24     //trigger on WorkOrder__c
25 }

```

```

1 trigger AssignmentTrigger on Assignment__c (after insert) {
2     if(trigger.IsAfter && trigger.IsInsert){
3         AssigningEmail.sendEmailMsg(trigger.New);
4     }
5 }

```

**FIG 8.2 Assignment Apex Class and Trigger Code**

**- Create Apex Class :** To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "CompletionMail" and click "OK."

```

1 public class CompletionMail {
2     public static void sendEmailMsg(List<WorkOrder__c> workOrderList){
3         List<messaging.SingleEmailMessage> myVar = new List<messaging.SingleEmailMessage>();
4         for(WorkOrder__c con : workOrderList){
5             if(con.Status__c == 'Resolved'){
6                 messaging.SingleEmailMessage mail = new messaging.SingleEmailMessage();
7                 List<String> sendTo = new List<String>();
8                 sendTo.add(con.Email__c);
9                 mail.setToAddresses(sendTo);
10                string subject = 'Status Updated';
11                mail.setSubject(subject);
12                string body = 'email body';
13                mail.setHTMLBody(body);
14                myVar.add(mail);
15            }
16        }
17        Messaging.sendEmail(myVar);
18    }
19 }

```

**FIG 8.3 Completion Apex Class Code**

**- Create an Asynchronous Apex Class :** To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "Record Deletion" and click "OK."



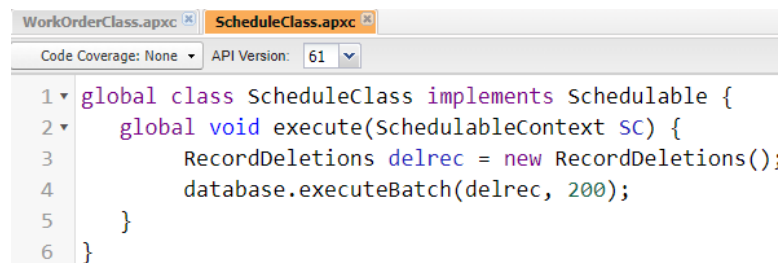
```

1 public class RecordDeletions implements Database.Batchable<SObject> {
2     public Database.QueryLocator start(Database.BatchableContext bc) {
3         string query = "SELECT Id, Name, WorkOrder_ID__c, Technician_ID__c, Assignment_Date__c, Completion_Date__c FROM Assignment__c WHERE Completion_Date__c < LAST_N_DAYS(30)";
4         return database.GetQueryLocator(query);
5     }
6     public void execute(Database.BatchableContext bc, List<Assignment__c> query){
7         if(!query.isEmpty()){
8             Delete Query;
9         }
10    }
11    public void finish(Database.BatchableContext bc){
12    }
13 }

```

**FIG 8.4 RecordDeletion Apex Class Code**

**- Create an Apex Schedule Class :** To create a new Apex Class in Salesforce, go to Setup, click the gear icon, and select "Developer Console." The Developer Console will open in a new window. Click on "File," then "New," and select "Apex Class." Name the class "Schedule" and click "OK."



```

1 global class ScheduleClass implements Schedulable {
2     global void execute(SchedulableContext sc) {
3         RecordDeletions delrec = new RecordDeletions();
4         database.executeBatch(delrec, 200);
5     }
6 }

```

**FIG 8.5 Schedule Apex Class Code**

**-Create A Schedule Apex :** To schedule an Apex class in Salesforce, go to Setup and search for "Apex Classes" in the Quick Find box. Click on "Schedule Apex." Enter the Job Name as "DeleteAssignmentSchedule," select "ScheduleClass" using the lookup icon for the Apex Class, set the Frequency to "Monthly," and choose a Preferred Start Time. Save the schedule to automate the Apex class execution.

## **9. Reports & Dashboards**

**-Create Reports :** To create a new report in Salesforce, go to the app and click on the Reports tab. Click "New Report." Select the report type from the category, report type panel, or search panel, then click "Start Report." Customize your report by adding fields from the left pane. Group the report by Work Order ID for better organization. Save and run the report to view the results.

Reports							Search recent reports...	New Report	New Folder	
Recent										
3 items										
REPORTS	Report Name	Description	Folder	Created By	Created On	Subscribed				
Recent	New Technician Report		Private Reports	cheerla varshi	21/10/2024, 7:16 pm					
Created by Me	New WorkOrder Report		Private Reports	cheerla varshi	21/10/2024, 7:17 pm					
Private Reports	New Assignments with WorkOrder ID Report		Private Reports	cheerla varshi	21/10/2024, 7:10 pm					

- Created a report type on "WorkOrders Status Reports", "Technician and Assignment Details Reports", "New Assignment with WorkOrder ID Report".

Report: Technician

New Technician Report

Enable Field Editing

Add Chart

Total Records

Total Phone

5

39,46,17,07,600

Technician	Technician ID	Name	Phone	Email	Location	Availability	Skills
<div>T-0001 (1)</div>		Raghu	7,86,23,41,560	cheerlavars11@gmail.com	Hyderabad	Available	Machine Installation
Subtotal			7,86,23,41,560				
<div>T-0002 (1)</div>		Raghu	7,86,23,41,560	cheerlavars11@gmail.com	Pune	Not Available	Hardware Repair

**FIG 9.1 Technician and Assignment Details Report**

**- Create Dashboards :** To create a dashboard in Salesforce, go to the app and click on the Dashboards tab. Click "New Dashboard," give it a name, and click "Create." Select "Add Component," choose the report you created previously, and click "Select." Click "Add," then "Save," and finally, click "Done" to complete the dashboard setup.

Dashboards							Search recent dashboards...	New Dashboard	New Folder	
Recent										
3 items										
DASHBOARDS	Dashboard Name	Description	Folder	Created By	Created On	Subscribed				
Recent	Dashboard1		Private Dashboards	cheerla varshi	21/10/2024, 7:21 pm					
Created by Me	Dashboard2		Private Dashboards	cheerla varshi	21/10/2024, 7:23 pm					
Private Dashboards	Dashboard1		Private Dashboards	cheerla varshi	21/10/2024, 7:17 pm					

- Created all three Dashboards on the above Reports.



**FIG 9.2 Technician and Assignment Details Report Dashboard**