

Contents

Creating an App from a Spreadsheet.....	2
Introduction	2
Task 2: Creating an application	4
Task 3: Running and exploring the new app	8
Summary	11
Improving the Faceted Search	12
Introduction	12
Task 1: Enhancing the Safe Facet	12
Task 2: Collapsing Facets	17
Task 3: Filtering Facets	18
Summary	19
Improving the Report and Form.....	20
Introduction	20
Task 1: Enhancing the Interactive Report	20
Task 2: Enhancing the Form	33
Task 3: (OPTIONAL) Enhancing the UX of the Form	39
Summary	45
Using Maps and Progressive Web App	47
Introduction	47
Task 1: Creating a Copy of an Existing Page	47
Task 2: Adding a Map Region	51
Task 3: Enhancing the Map Region	57
Task 4: Installing a Progressive Web App (PWA)	68
Summary	70

Creating an App from a Spreadsheet

In this lab, you learn to create an APEX application using the data imported from a spreadsheet. You will learn to import a spreadsheet which consists of a list of High Schools in New York City. [Click here](#) to download the spreadsheet for this lab.

Introduction

Now that you are logged into your workspace, you can start creating APEX applications. In this lab, you build a simple application based on a spreadsheet. Keep in mind that APEX is great for a variety of apps, from simple ones like this to large, sophisticated apps based on local database objects, REST enabled SQL objects, and even REST APIs.

While APEX developers spend the majority of their time in the **App Builder**, you should also investigate the following:

- **SQL Workshop**: where you can create and maintain database objects.
- **Team Development**: where you can track large APEX development projects.
- **Gallery**: which contains numerous productivity and sample apps that can be installed within minutes.

Note: The screenshots in this workshop are taken using Dark Mode in APEX 22.1.

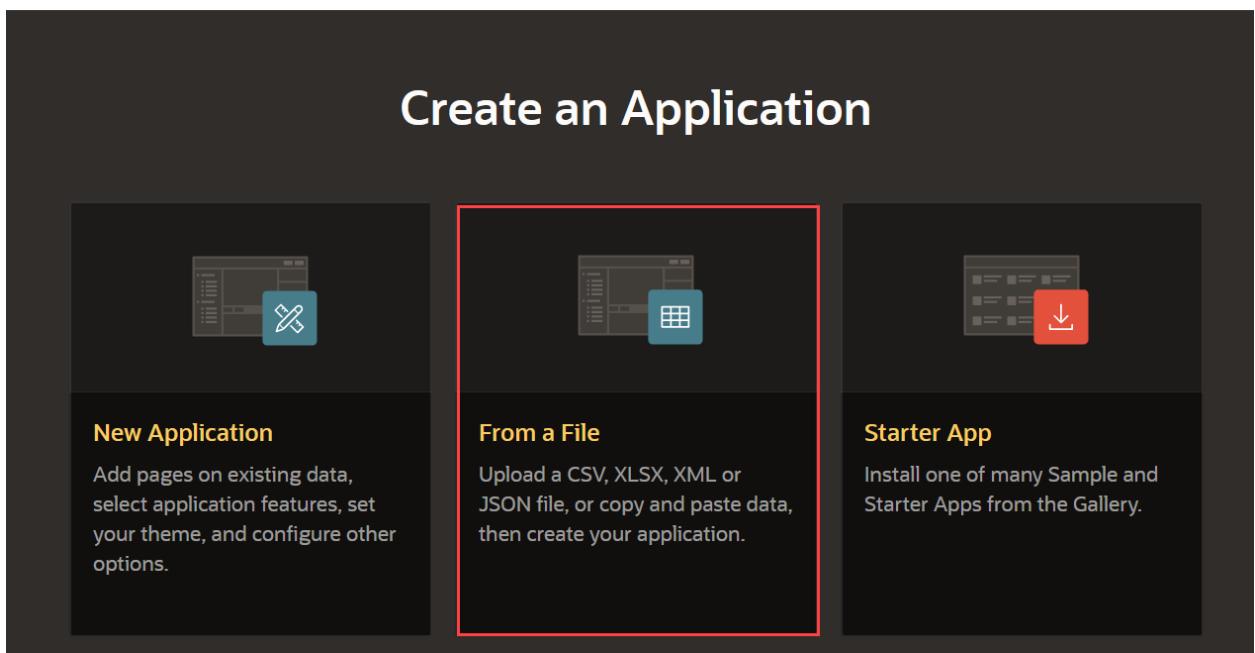
Estimated Time: 5 minutes

Collapse All Tasks

Task 1: Loading the Highschool data

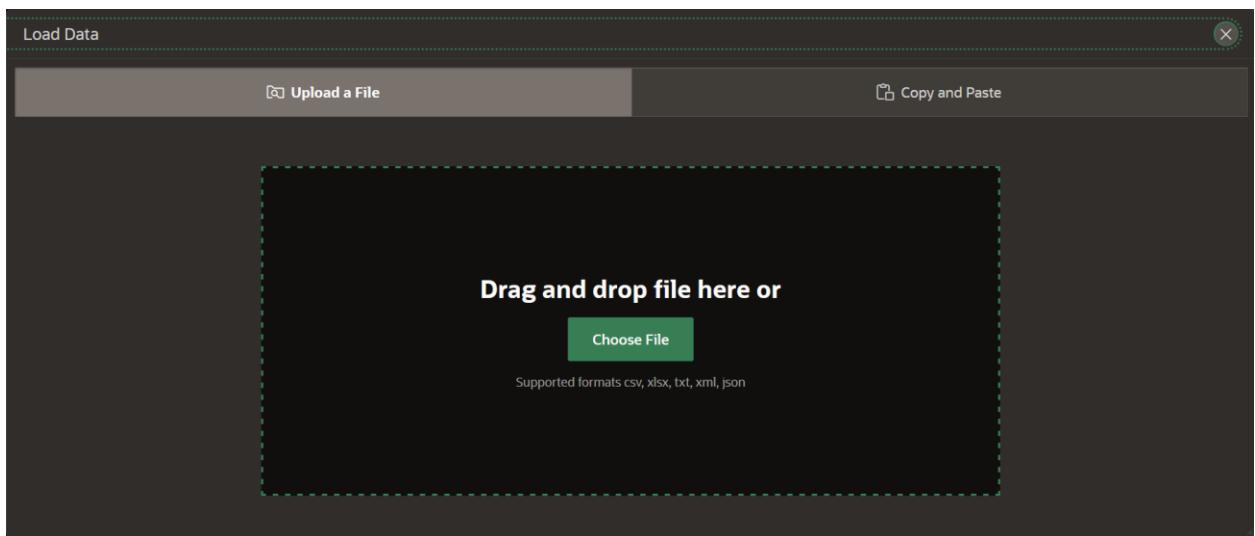
1. From your APEX workspace home page, click **App Builder**.
2. Click **Create a New App**.
3. Click **From a File**.

Create an Application

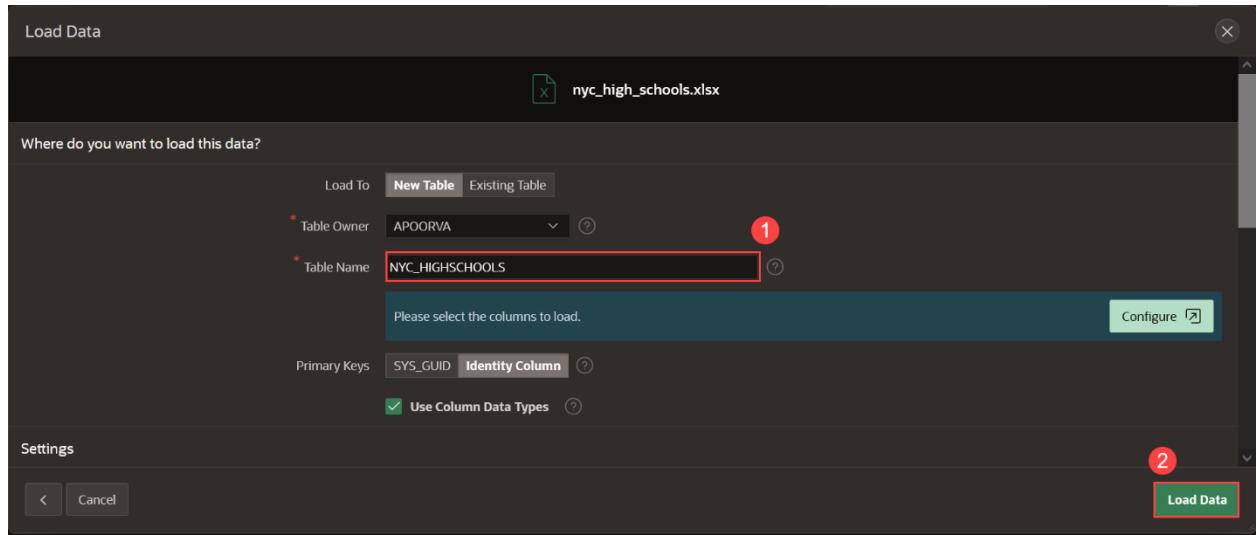


When creating an application from a file, APEX allows you to upload CSV, XLSX, XML, or JSON files and then build apps based on their data. Alternatively, you can also copy and paste CSV data or load sample data.

4. Within the Load Data wizard, click the **Choose File** option or drag and drop the [nyc_high_schools.csv](#) file on to the dialog window.



5. Review the parsed data. Set Table Name to **NYC_HIGHSCHOOLS** and click **Load Data**. Note: You can configure what columns to load from the spreadsheet by clicking the **Configure** button.

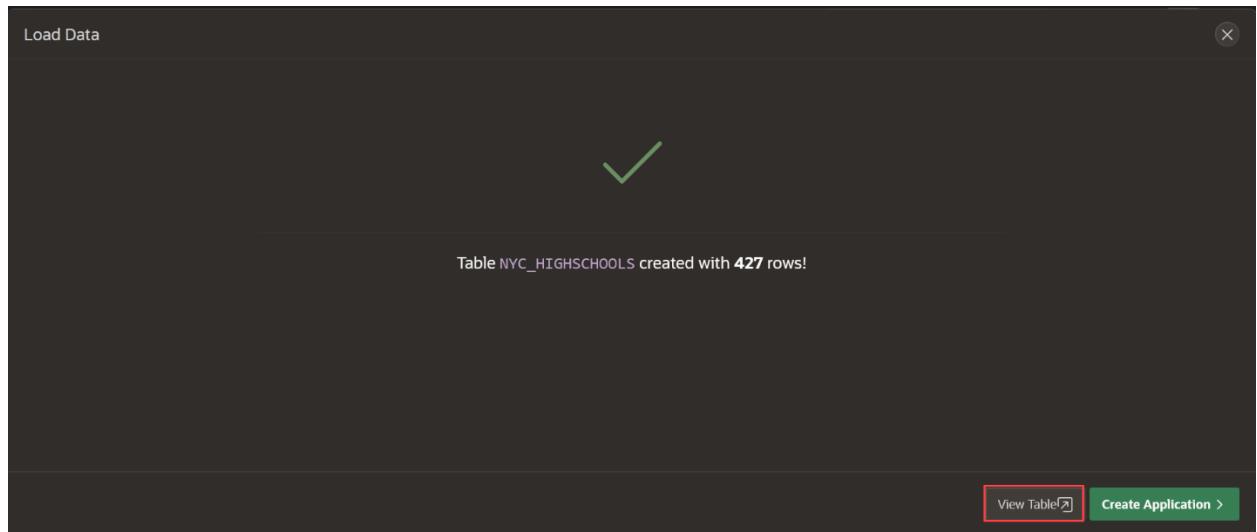


After clicking **Load Data**, you will see a spinner until the wizard finishes loading the data. Continue to Task 2 at that point.

Task 2: Creating an application

The Data Load wizard has created a new table and populated that table with the records from the sample data. Now you can create an app based on this new table.

1. In the Load Data dialog, verify that 427 rows have been loaded into the **NYC_HIGHSCHOOLS** table, then click **View Table**.



2. In the Object Browser, review the table structure.
In the Table toolbar, click **Create App**.

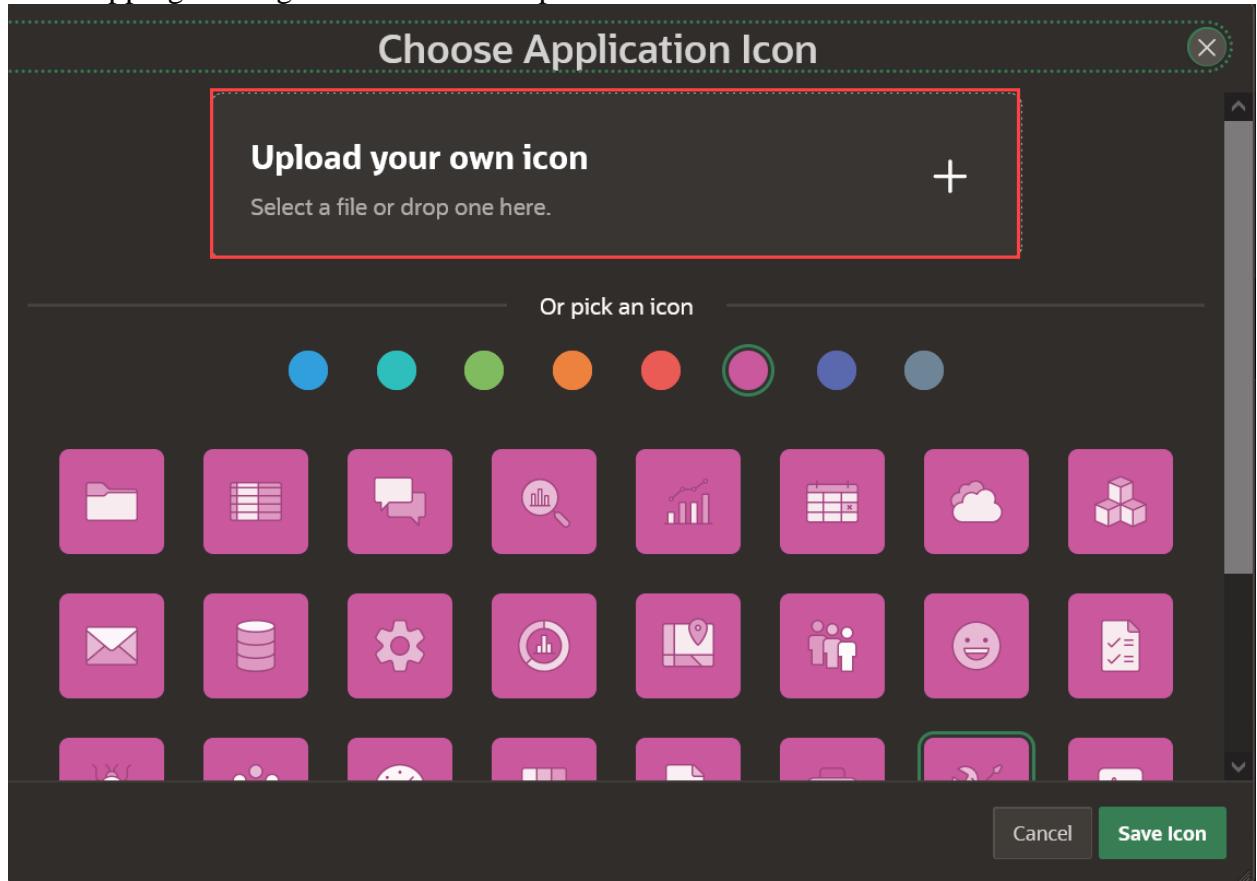
The screenshot shows the Oracle APEX SQL Workshop interface. In the top navigation bar, the 'APEX' logo, 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery' are visible. On the right, there's a search bar, a user icon for 'apoorna', and a schema dropdown set to 'APOORVA'. The main area is titled 'Object Browser' and shows a tree view with 'Tables' selected. Under 'Tables', 'NYC_HIGHSCHOOLS' is expanded, revealing its columns: ID, BOROUGH, SCHOOL_NAME, NEIGHBORHOOD, INTEREST, METHOD, and TOTAL_STUDENTS. The table structure is displayed in a grid format with columns for 'Column Name', 'Data Type', 'Nullable', 'Default', and 'Primary Key'. The 'Create App' button in the toolbar is highlighted with a red box.

NYC_HIGHSCHOOLS				
Table	Data	Indexes	Model	Constraints
Add Column	Modify Column	Rename Column	Drop Column	Rename
Create App				
ID	NUMBER	No	"APOORVA"."ISEQ\$\$_94418".nextval	1
BOROUGH	VARCHAR2(50)	Yes	-	-
SCHOOL_NAME	VARCHAR2(255)	Yes	-	-
NEIGHBORHOOD	VARCHAR2(50)	Yes	-	-
INTEREST	VARCHAR2(255)	Yes	-	-
METHOD	VARCHAR2(50)	Yes	-	-
TOTAL_STUDENTS	NUMBER	Yes	-	-

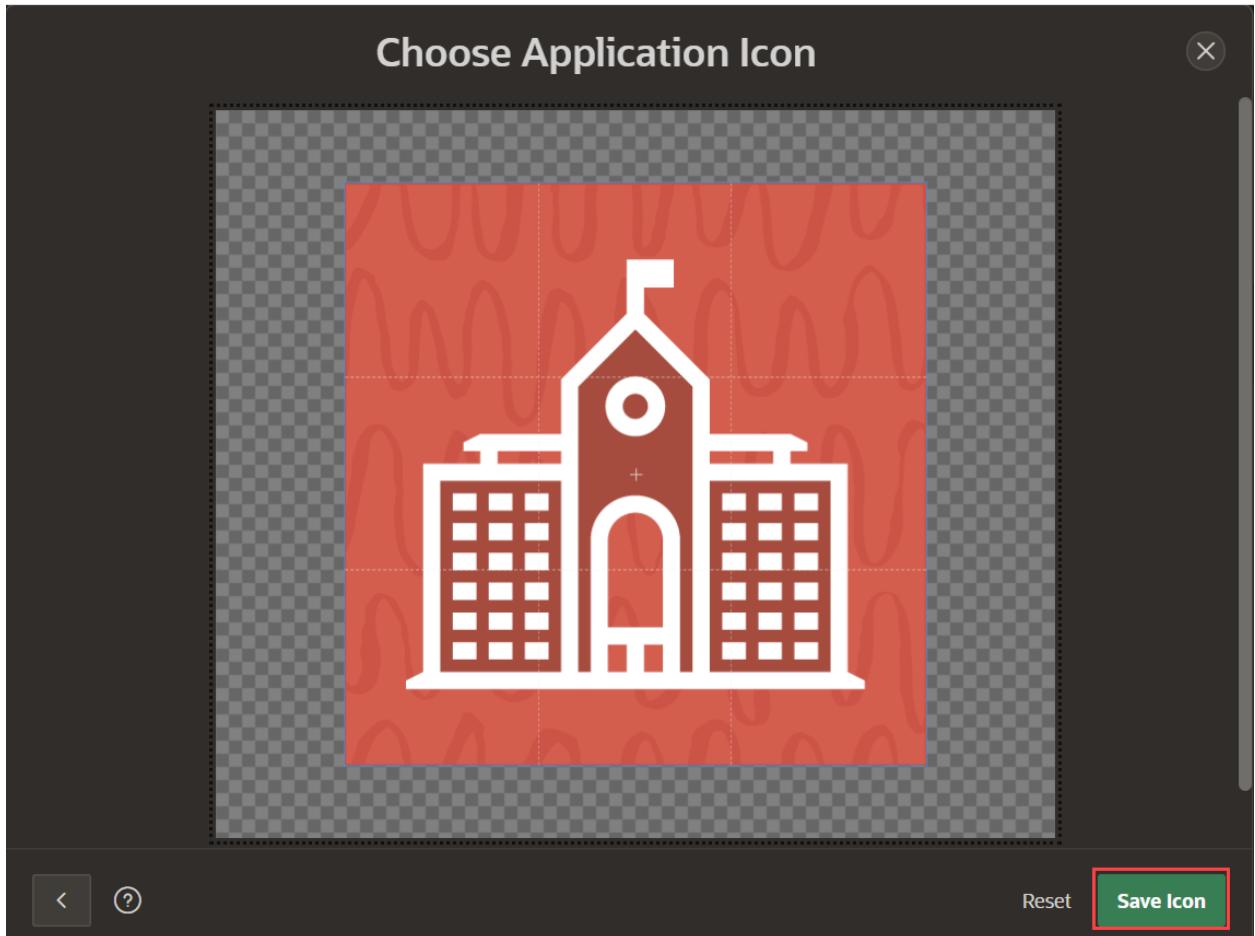
3. On the Create Application page, click **Create App**.
4. On the Create Application page, enter the Name as **NYC Highschools** and click the application icon.

The screenshot shows the Oracle APEX App Builder 'Create an Application' page. At the top, there are links for 'View Blueprint' and 'Load Blueprint'. Below that is the title 'Create an Application'. On the left, there's a sidebar with a database icon and the name 'NYC Highschools'. To the right, there's a section for 'Appearance' with the setting 'Vita, Side Menu'. Below this, there's a 'Pages' section with a '+ Add Page' button and a list of pages: 'Home' (Blank) and another unnamed page. At the bottom, there are 'Cancel' and 'Create Application' buttons, with the 'Create Application' button highlighted with a red box.

5. In the Choose Application Icon wizard, upload your own icon by selecting or dragging and dropping an image. Download a sample icon from [here](#).



6. Once you select an image, the wizard allows you to crop or resize the image. Click **Save Icon**.



7. In the Create Application page, review the pages listed. Click the **Edit** button for **Nyc Highschools Search** and **Nyc Highschools Report** pages to review more details and update the names to the following:

- NYC Highschools Search
- NYC Highschools Report

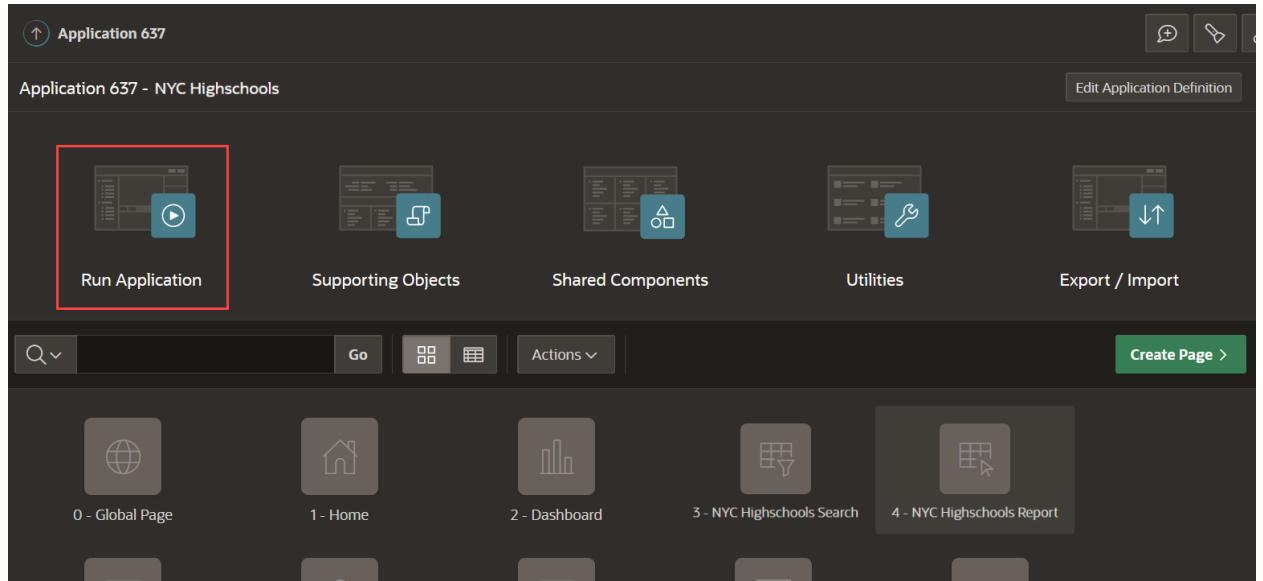
Click the checkbox for **Install Progressive Web App** for Features, and then click **Create Application**. You will learn about Progressive Web App in *Lab 4* of this workshop.

The screenshot shows the 'Create an Application' wizard in Oracle APEX. The application name is 'NYC Highschools'. The appearance is set to 'Vita, Side Menu'. The 'Pages' section lists four pages: 'Home' (Blank), 'Dashboard' (Dashboard), 'NYC Highschools Search' (Faceted Search), and 'NYC Highschools Report' (Interactive Report with Form). The 'Features' section has five options: 'Install Progressive Web App' (selected), 'About Page', 'Access Control', 'Activity Reporting', 'Configuration Options', 'Feedback', and 'Theme Style Selection'. The 'Settings' section includes fields for Application ID (637), Schema (APOORVA), Authentication (Oracle APEX Accounts), Language (English (en)), Advanced Settings, and User Interface Defaults. The 'Create Application' button is highlighted.

When the wizard finishes creating the application, you will be redirected to the application's home page in the App Builder.

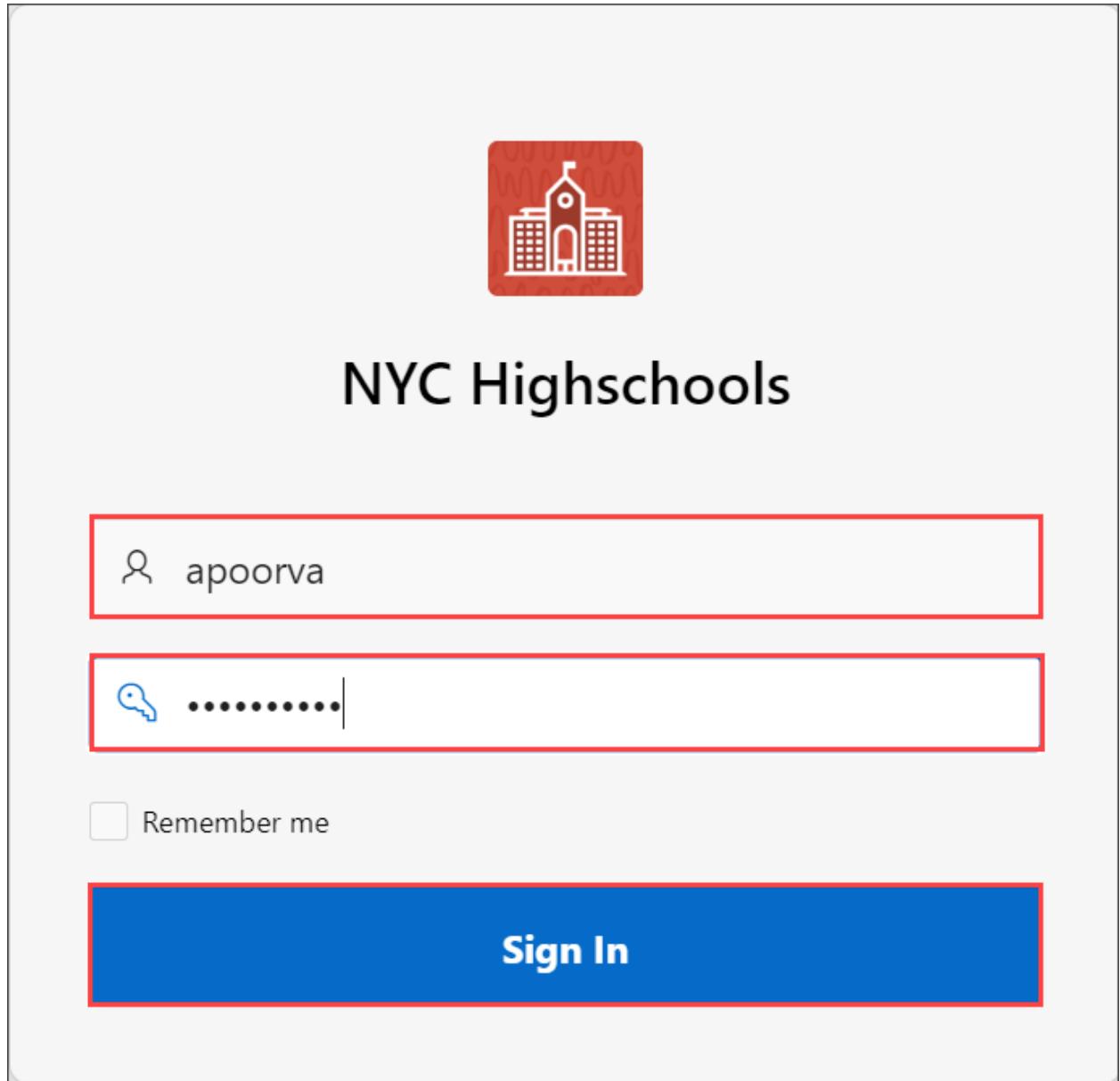
Task 3: Running and exploring the new app

1. Click **Run Application**. This will open the runtime application in a new browser tab, allowing you to see how end users will view the app.

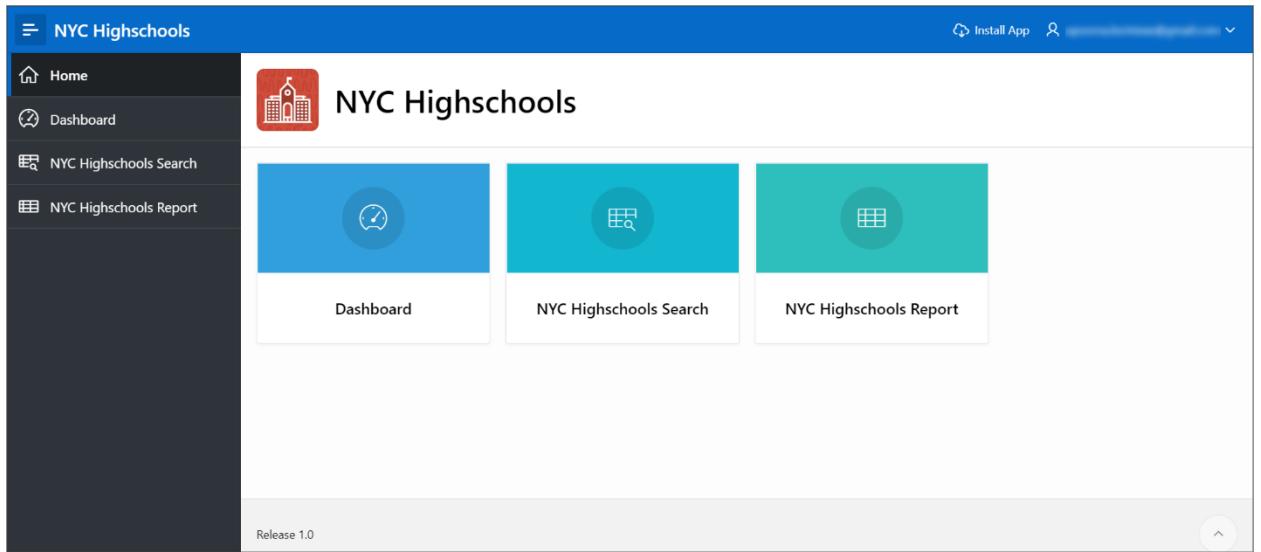


2. Enter your user credentials and click **Sign In**. Notice the custom application icon displayed at the top.

Note: Use the same Username and Password you used to sign into the APEX Workspace.



3. Explore the application a little.
 - Click **Dashboard** (in the home menu or the navigation menu) to view the charts created.
 - Click **NYC Highschools Search**, in the navigation menu, to play with the faceted search.
 - Click **NYC Highschools Report** to view an interactive report, then click the edit icon for a record to display the details in an editable "form" page. Finally, review the options available under **Administration**.



Summary

You now know how to create an application from a spreadsheet by dragging and dropping a file.

Improving the Faceted Search

Introduction

In this lab, you will get a first-hand experience with enhancing the application by improving the faceted search page for better clarity and improved usability. The search page includes facets on the left which can readily be used to limit the data shown in the report on the right.

If you review the **NYC Highschools Search** page, you can check and uncheck various facets. When you check a facet, the counts on all of the remaining facets will be updated to show the number of records that meet the new criteria.

Estimated Time: 10 minutes

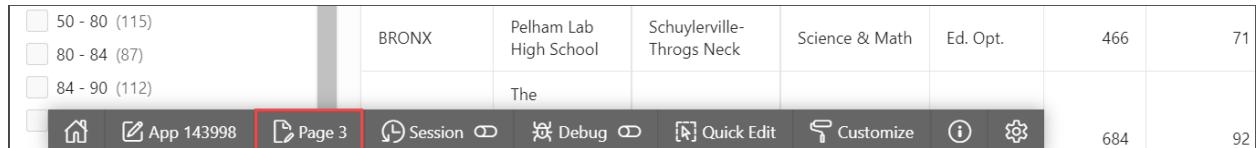
Collapse All Tasks

Task 1: Enhancing the Safe Facet

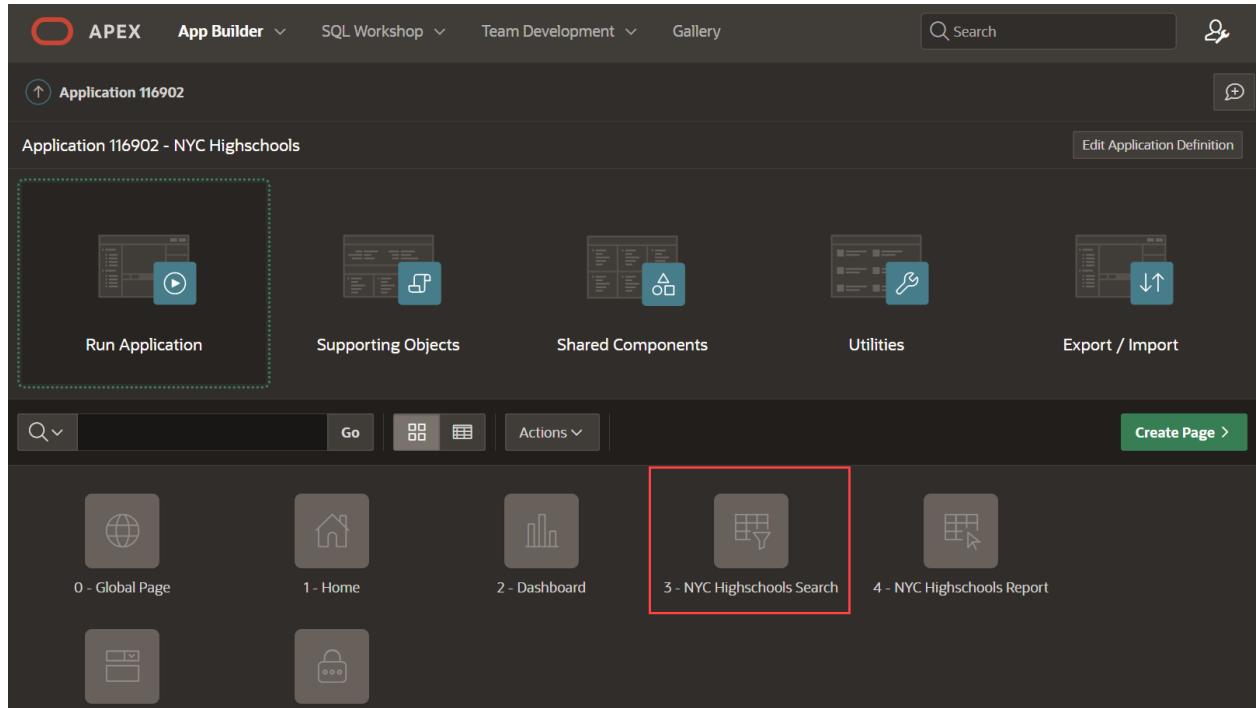
Reviewing the facets, you will notice that **Safe** is down the page and you can choose multiple range values from a checkbox group.

1. From the runtime application, go to the search page by clicking **NYC Highschools Search**. Assuming that you ran this app from the APEX App Builder, a Developer Toolbar is displayed at the bottom of the screen. *Note - End users who log directly into the app will not see this toolbar.*

In the Developer Toolbar click **Page 3**.



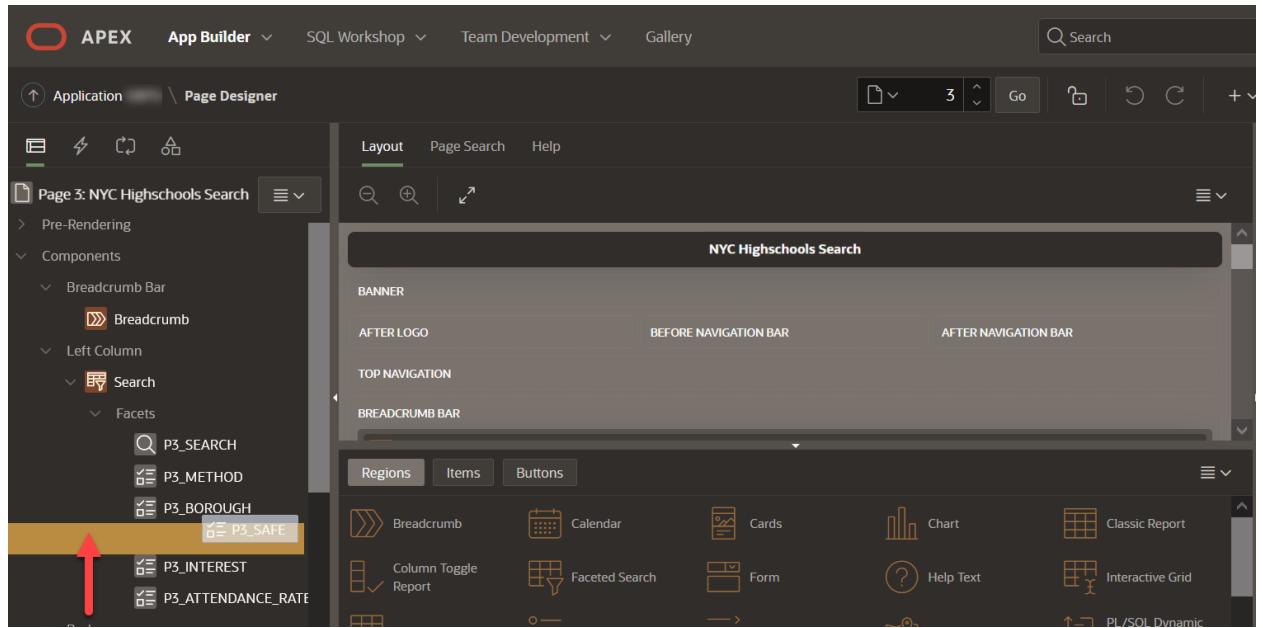
Alternatively, you can also navigate back to the APEX App Builder tab in your browser manually by selecting the appropriate browser tab or window. Once in the App Builder click **3 - NYC Highschools Search**.



You should now be in the Page Designer. Page Designer is where you will spend the majority of your time improving your application. There are three panes within Page Designer.

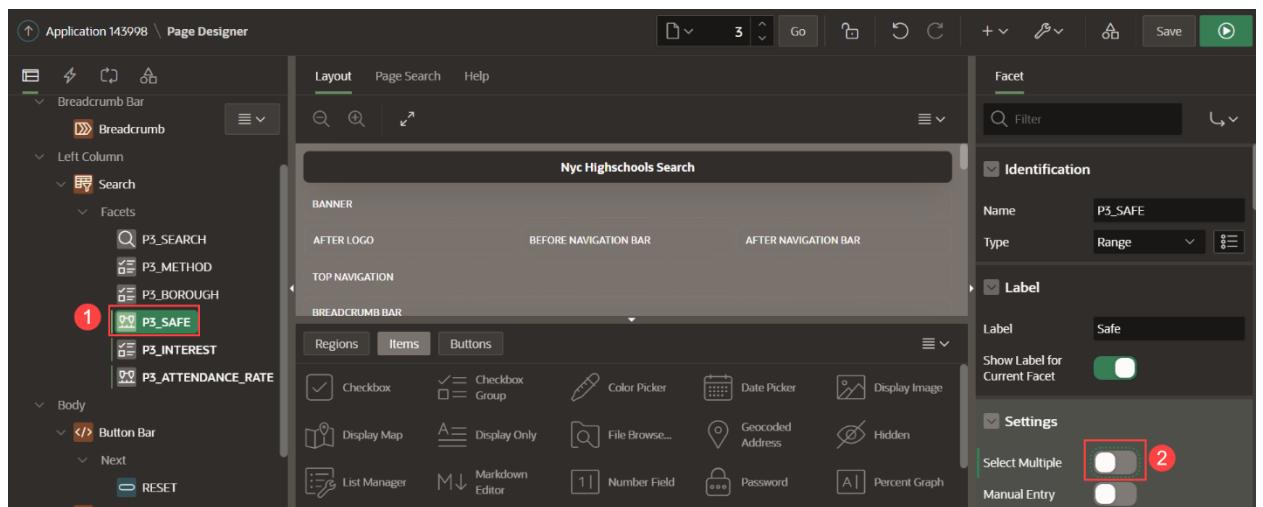
- The left pane initially displays the Rendering tree, with a list of page components.
 - The middle pane displays the Layout, a representation of the page, and Gallery, from which you can drag and drop new components into the Layout.
 - The right pane is the Property Editor, where you can change attributes for the selected component.
2. Safety of a Highschool is a very important search criteria while selecting a High School, so you want to reorder the facets such that **Safe** is between **Borough** and **Interest**.

In the Rendering tree (left pane), under **Search**, within **Facets**, click and hold **P3_SAFE** and drag it up until it is under **P3_BOROUGH** then release the mouse.



3. Currently the **Safe** facet is a checkbox group with range values. However, it is unlikely that users will want to select multiple safety percentage value, so you will convert it into a radio range group.

Continuing with **P3_SAFE** selected, within the Property Editor (right pane), under **Settings**, toggle the **Select Multiple** button such that multiple values cannot be selected.



4. At the top right of the page click **Save and Run Page** to save the changes made to the facets and review the app.



- In the runtime environment, click one of the **Safe** ranges. Review how the counts on the other facets are updated based on your selection. Also notice how you can still select one of the other **Safe** ranges or click **Clear**, within the **Safe** facet, to clear your selection and again show all the counts for all the safety ranges.

Borough	School Name	Neighborhood	Interest	Method	Total Students	Graduation Rate	Attendance Rate
BRONX	Crotona International High School	Belmont	Humanities & Interdisciplinary	Screened: Language	335	63	83
BRONX	Pelham Lab High School	Schuylerville-Throgs Neck	Science & Math	Ed. Opt.	466	71	83
QUEENS	Eagle Academy for Young Men III	St. Albans	Humanities & Interdisciplinary	Ed. Opt.	531	93	91
BRONX	Eagle Academy for Young Men	Claremont-Bathgate	Humanities & Interdisciplinary	For Continuing 8th Graders	511	74	87

Note: As an optional step, you can follow the same steps in **STEP 1** to customize the **Attendance Rate** facet.

- You can view each of the facets and their respective counts as a chart. To view the chart, click on the context menu next to the **Borough** facet and select **Show Chart**. A chart dialog window is displayed with the Borough names on the X-axis and the count on the Y-axis.

NYC Highschools Search

Transfer (1)

Total Row Count 115

Borough

Safe 50 - 80 X

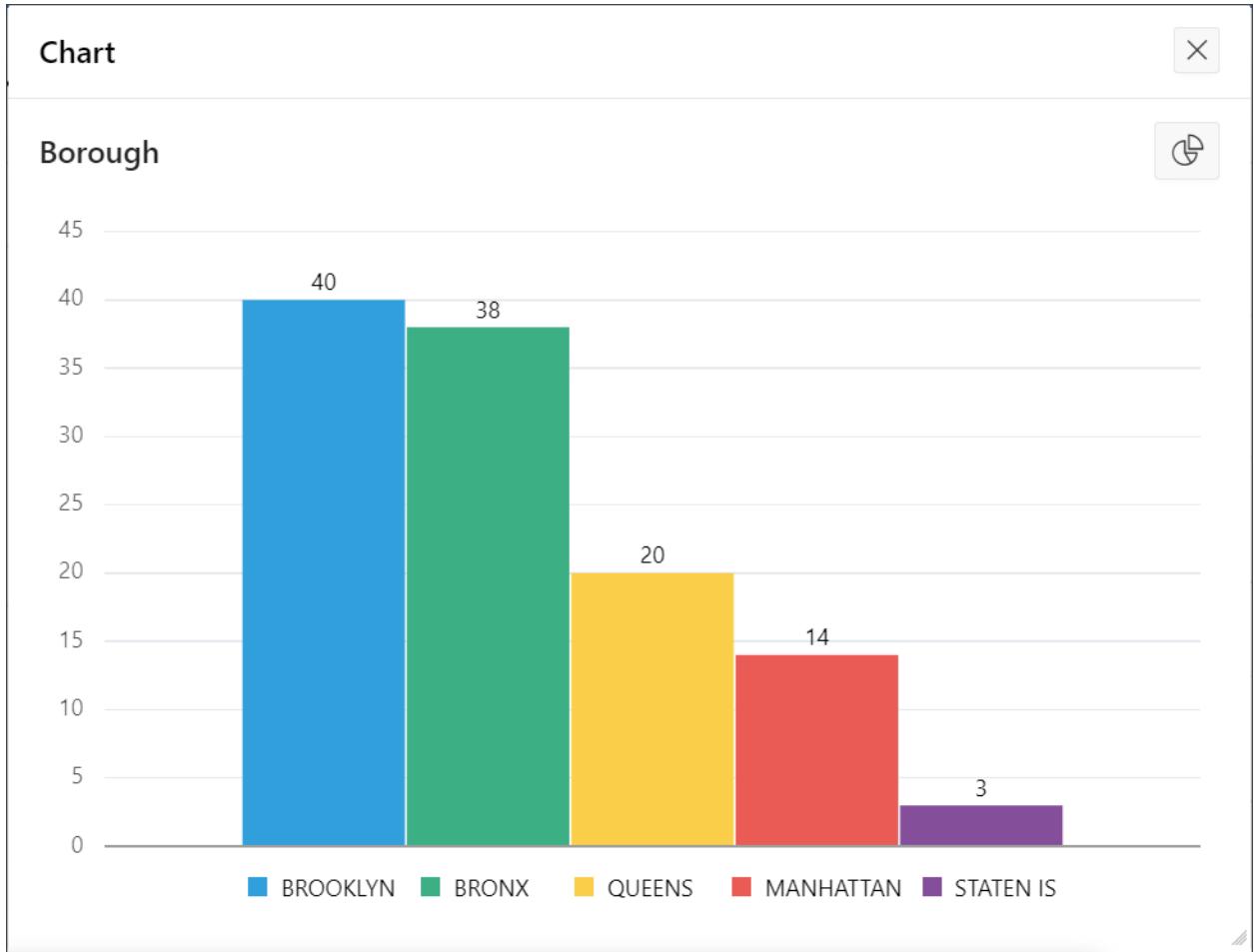
Filter

Show Chart

	School Name	Neighborhood
BRONX	Crotona International High School	Belmont
BRONX	Pelham Lab High School	Schuylerville-Throgs Neck
QUEENS	Eagle Academy for Young Men III	St. Albans
BRONX	Eagle Academy for Young Men	Claremont-Bathgate

Safe Clear :

- <50 (1)
- 50 - 80 (115)**
- 80 - 84 (87)
- 84 - 90 (112)
- >=90 (112)

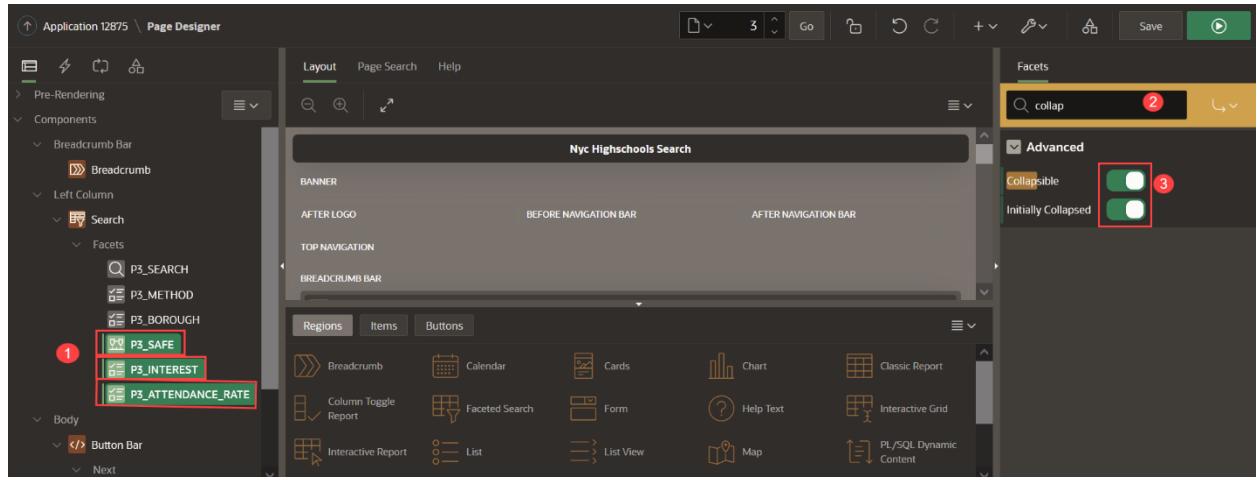


Task 2: Collapsing Facets

1. You may have noticed that the facets go off the bottom of the page. Therefore, it would be preferable to collapse the last three facets, making it easier to see all available facets.

Navigate back to the development environment (APEX App Builder) by using the edit link in the Developer toolbar, or manually navigating to the appropriate browser tab.

In the Rendering tree (left pane), under **Search**, within **Facets**, click **P3_SAFE**, hold down the **Shift** key and then click **P3_ATTENDANCE_RATE**, such that three facets are selected. In the Property Editor (right pane), within the filter at the top, enter **collap**, so that Collapsible is displayed under Advanced. When you toggle the switch for **Collapsible, Initially Collapsible** property appears. For Advanced > Initially Collapsed, change the switch to selected.



Note - Rather than entering a filter you can also scroll down the properties until you find the correct attribute to update.

2. Click **Save and Run Page** to see the improved search page.

Borough	School Name	Neighborhood	Interest	Method	Total Students	Graduation Rate	Attendance Rate
BRONX	South Bronx Preparatory: A College Board School	Mott Haven-Port Morris	Humanities & Interdisciplinary	For Continuing 8th Graders	659	96	92
BROOKLYN	Brooklyn College Academy	Windsor Terrace	Humanities & Interdisciplinary	Screened	622	98	95
BROOKLYN	Rachel Carson High School for Coastal Studies	West Brighton	Environmental Science	Ed. Opt.	639	67	86
MANHATTAN	Heritage School, The	East Harlem South	Health Professions	Ed. Opt.	294	73	88
	The High						

Task 3: Filtering Facets

1. Some facets may have multiple values to choose from and becomes difficult for the end user to scroll and select the values. APEX 22.1 introduces a new filter feature for facets which provides a search bar to search and filter facet values.

Click the context menu (three dots) next to the facet name **Method**. Select **Filter**.

The screenshot shows the 'NYC Highschools Search' page. On the left is a dark sidebar with navigation links: Home, Dashboard, NYC Highschools Search (which is selected and highlighted in blue), and NYC Highschools Report. The main content area has a title 'NYC Highschools Search' and a search bar labeled 'Search...'. Below the search bar is a table with the header 'Total Row Count 427'. The table has columns for 'Method', 'Borough', 'School Name', 'Neighborhood', and 'Interest'. A 'Filter' button is overlaid on the 'Borough' column header. A tooltip 'Show Chart' is visible below the 'Filter' button. The table data includes several entries for Brooklyn and Manhattan schools.

2. A search filter is displayed below the facet name. Type **Transf** in the text box and all the facet values that contain the substring will be displayed. You can then select the checkbox for **Transfer** to be filtered in the report.

The screenshot shows the 'NYC Highschools Search' page after applying a search filter. The search bar now contains 'transf'. The facet for 'Method' shows a checked checkbox for 'Transfer (7)'. The table has a header 'Total Row Count 7'. The 'Method' column header has a 'Transfer' link next to it. The table data shows seven schools, all of which are listed under the 'Transfer' method.

Summary

You now know how to enhance a faceted search page and modify the properties on a page using the Page Designer.

Improving the Report and Form

Introduction

In this lab, you will gain an insight into the abilities of Interactive Reports, and learn how to enhance a form page.

Estimated Time: 20 minutes

Collapse All Tasks

Task 1: Enhancing the Interactive Report

The **NYC Highschools Report** page utilizes an Interactive Report to display the records. Interactive Reports are exceedingly powerful, as they allow *end users* to modify what data is displayed, and various display characteristics. For this report, you will add a column break, a computational column, an aggregate, a chart, then order the data and save the report for everyone to see.

Note - All of the steps below, except for saving Alternative Reports, can be performed by end users. There are many additional capabilities available to end users which are not covered below.

1. In the runtime environment, click **NYC Highschools Report**.
2. The report displays all the columns in the table. Customize the report by choosing only selected columns in a report. Click **Actions** and select **Columns**.

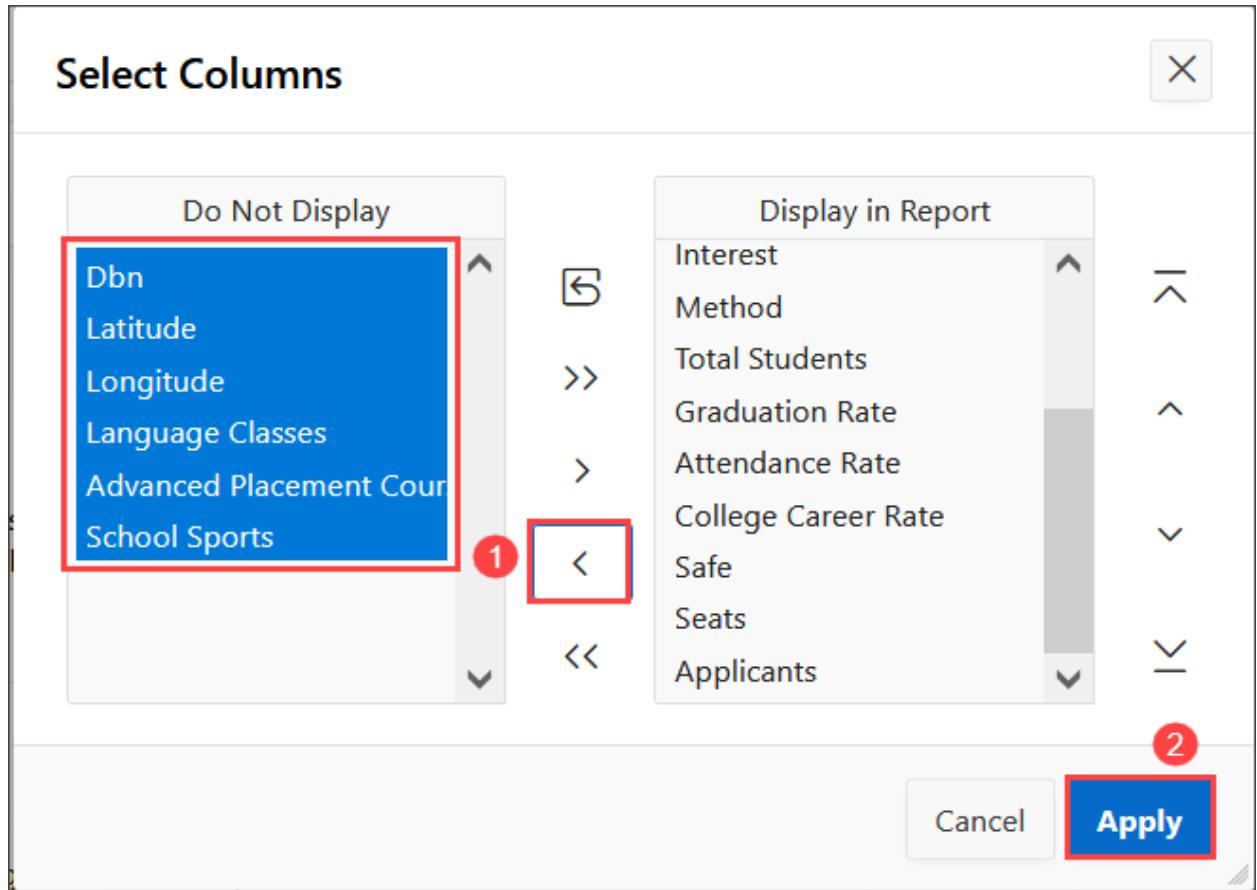
NYC Highschools Report						
	Borough ↑	School Name	Neighborhood	Method	Total Students	Graduation Rate
	BRONX	Longwood Preparatory Academy	Longwood	Ed. Opt.	199	50
	BRONX	High School for Contemporary Arts	Williamsbridge Olinville	Ed. Opt.	446	75

The screenshot shows a data grid titled "NYC Highschools Report". At the top right of the grid, there is a "Actions" dropdown menu. A sub-menu is open under "Actions", specifically the "Columns" option, which is highlighted with a red box. This sub-menu contains several options: Filter, Data, Format, Chart, Group By, Pivot, Report, Download, and Help. The main grid below shows two rows of data. The first row corresponds to the "Longwood Preparatory Academy" in the Bronx, with "Longwood" listed under Neighborhood. The second row corresponds to the "High School for Contemporary Arts" in the Bronx, with "Williamsbridge Olinville" listed under Neighborhood. Each row includes an edit icon in the first column and columns for Borough, School Name, Neighborhood, Method, Total Students, and Graduation Rate.

- In the Select Columns dialog, select the columns that you want to hide from the report by selecting a column and clicking on the left-chevron (<) in order to move it to the **Do Not Display** section. Or, double-click on a column in order to move it to the **Do Not Display** section. Hide the following columns:

- Dbn
- Latitude
- Longitude
- Language Classes
- Advanced Placement Courses
- School Sports

Click **Apply**.



4. The interactive report is displayed by hiding the selected columns from the previous step. Click the **Neighborhood** column heading, and then select **Control Break**.

NYC Highschools Report

		School Name ↑↓	Neighborhood	Interest	Method	Total Students	Graduation
Borough							
	MANHATTAN	47 The American Sign Language and English Secondary School	Gran...	Filter...	Control Break	165	
	MANHATTAN	A. Philip Randolph Campus High School	Mar...	Astoria	Opt.	1375	
	BROOKLYN	ACORN Community High School	Crov...	Auburndale			
	BROOKLYN	Abraham Lincoln High School	Baisley Park		Opt.	193	
		Academy for	Bay Ridge				
			West Brighton	Animal Science	Ed. Opt.	1998	

5. You can add a computational column, where a new column is defined based on a computation against one or more existing columns in the report. Columns are selected within the computation using a letter associated with each column.

At the top of the report, click **Actions**, select **Data**, and then select **Compute**.

NYC Highschools Report

The screenshot shows a report titled "NYC Highschools Report". The report has two sections: "Neighborhood: Annadale-Huguenot-Princes Bay" and "Neighborhood: Astoria". The columns are "Borough" and "School Name". The data shows:

Borough	School Name	Method	Total Students
STATEN IS	Tottenville High School	Ed. Opt.	3808

For "Neighborhood: Astoria":

Borough	School Name	Method	Total Students
QUEENS	Frank Sinatra School of the Arts High School	Film/Video	831
QUEENS	William Cullen Bryant High School	Law & Government	2394
QUEENS	Long Island City High School	Computer Science & Technology	2256

The "Actions" dropdown menu is open over the first row of the main report. The "Compute" option is highlighted with a red box.

- On Compute, enter the following and click **Apply**.

Table 1: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Property	Value
Column Label	Application to Seat Ratio
Format Mask	5,234.10
Computation Expression	M / L

Compute

Computation

- New Computation -

Column Label

Application to Seat Ratio

Format Mask

999G999G999G999G990D00

Computation Expression

M / L

► Examples

Columns

- I. Attendance Rate
- J. College Career Rate
- K. Safe
- L. Seats
- M. Applicants
- N. Dbn

Keypad

()	.	
7	8	9	-
4	5	6	+
1	2	3	*
0	.	/	

Functions / Operators

!=
<
<=

=
>
>=

Cancel

Apply

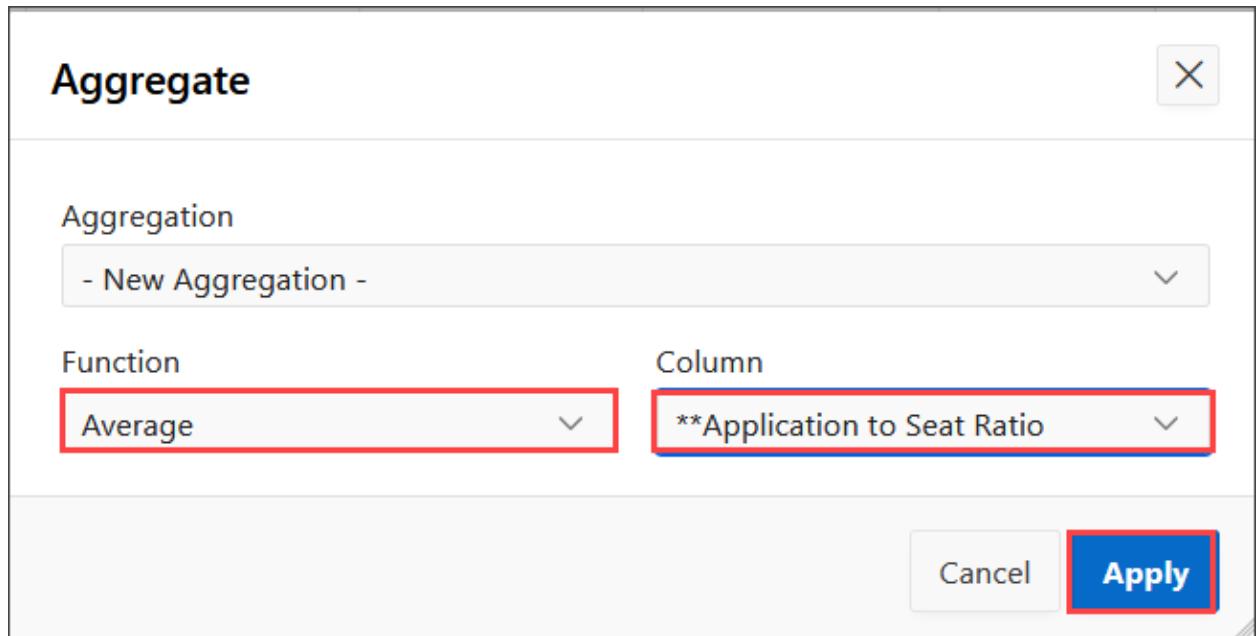
7.

8. This adds a new column **Application to Seat Ratio** to your interactive report.
9. To calculate the average Application to Seat Ratio in each Neighborhood, click **Actions**, select **Data**, and then select **Aggregate**.

NYC Highschools Report

The screenshot shows a data visualization tool interface for the 'NYC Highschools Report'. At the top, there's a search bar, a 'Go' button, and a 'Actions' dropdown menu. Below the header, there are two sections: 'Neighborhood: Annadale-Huguenot-Princes Bay' and 'Neighborhood: Astoria'. Each section has a table with columns for 'Borough', 'School Name', and other metrics like 'Total Students', 'Graduation Rate', etc. A context menu is open over the first row of the 'Astoria' table, with 'Data' selected. Under 'Data', 'Aggregate' is highlighted in blue. Other options in the 'Data' submenu include 'Compute', 'Sort', 'Method', 'Format', 'Chart', 'Group By', 'Pivot', 'Report', 'Download', and 'Help'.

10. On Aggregate, for Column select **Application to Seat Ratio**, for Function select **Average**, then click **Apply**.



11. Even though you can see the average Application to Seat Ratio for each Neighborhood, it would be much easier to view the average on a chart to get an overall picture of the neighborhoods which have the best High Schools.

In the report click **Actions**, select **Chart**.

12. In the Chart dialog, select / enter the following and click **Apply**.

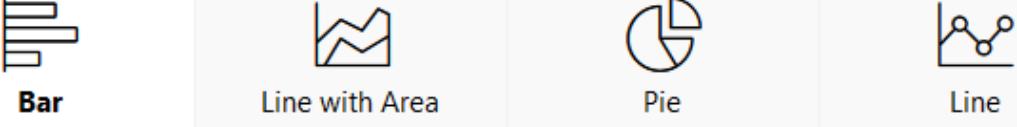
Table 2: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Property	Value
Label	Borough
Value	**Application to Seat Ratio

Table 2: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Property	Value
Function	Average
Orientation	Horizontal

Chart



Bar **Line with Area** **Pie** **Line**

Label

Axis Title for Label

Value

Axis Title for Value

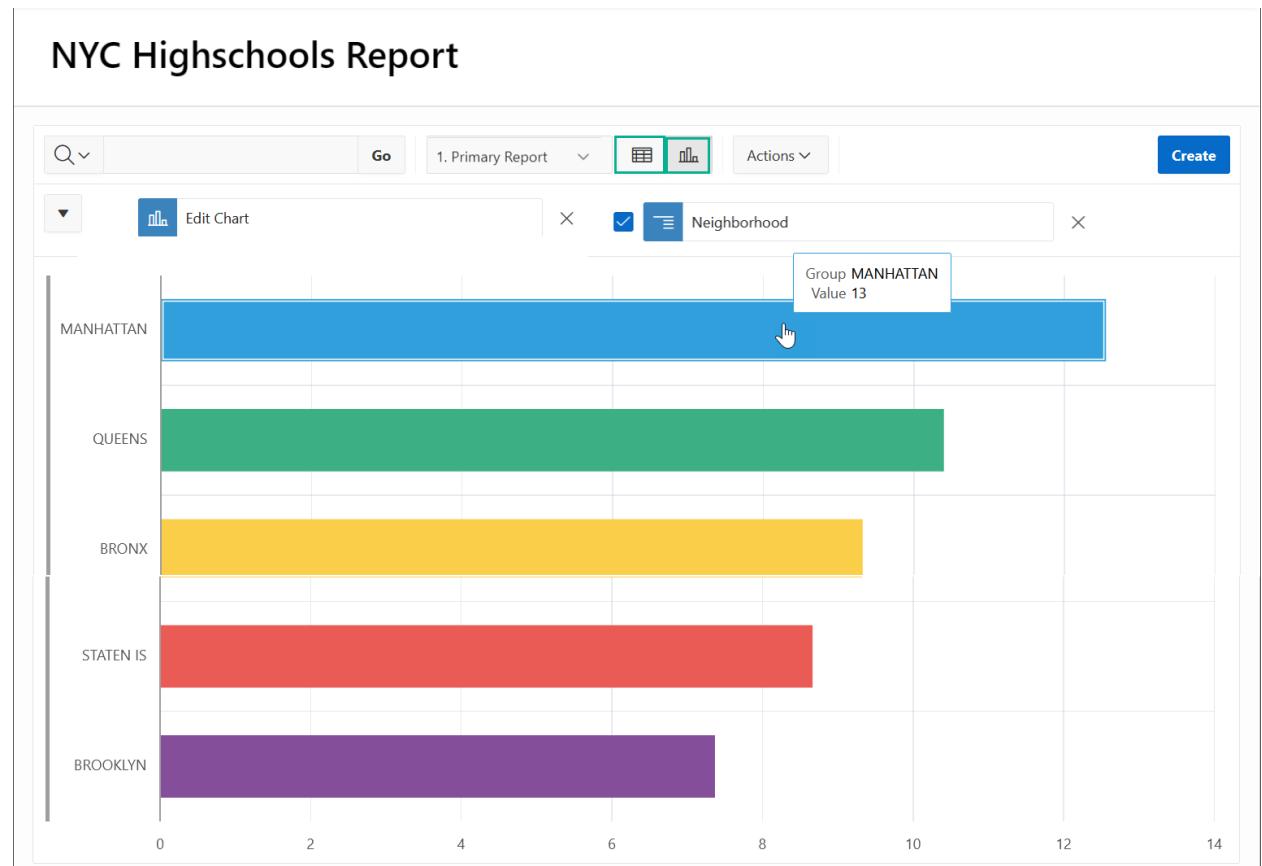
Function

Orientation

Sort

Cancel
Delete
Apply

14. After you click **Apply**, the chart will be displayed. Hover over individual bars to view the neighborhood and the average. Toggle between the report view and chart view using the icons at the top of the report.



15.

16. You want to ensure that all of the records are ordered in the ascending order of School Name and descending order of seats, within each neighborhood.

At the top of the report, click the **View Report** icon. Click **Actions**, select **Data**, and then select **Sort**.

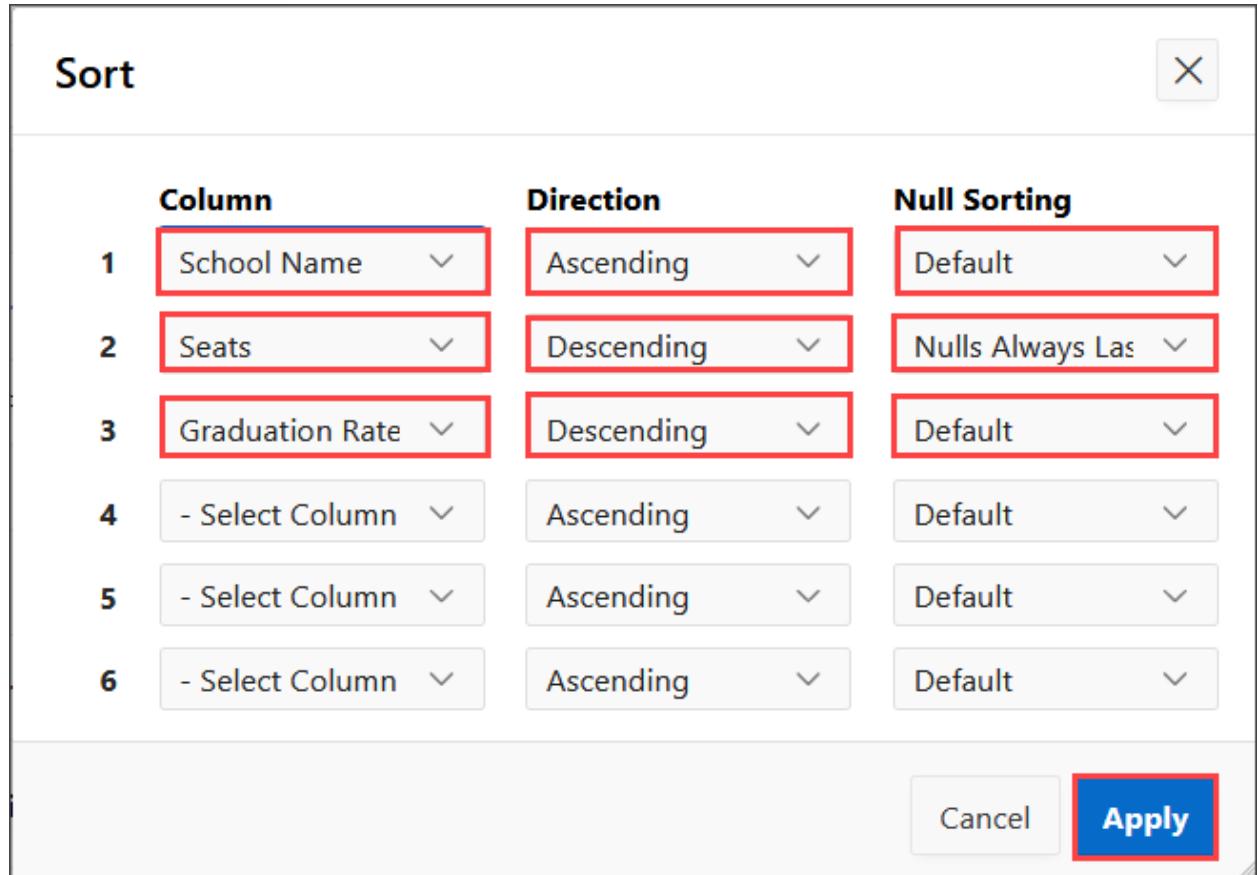
The screenshot shows a web-based application titled "NYC Highschools Report". At the top, there is a search bar, a "Go" button, and a toolbar with icons for columns, filters, and actions. A red box highlights the "Actions" dropdown menu. The menu is open, showing options like "Columns", "Filter", "Data" (which is highlighted with a red box), "Format", "Chart", "Group By", "Pivot", "Report", "Download", "Help", and "Technology". Below the menu, there are two tables. The first table is titled "Neighborhood: Annadale-Huguenot-Princes Bay" and lists "Borough" and "School Name". The second table is titled "Neighborhood: Astoria" and also lists "Borough" and "School Name". To the right of these tables is a summary table with columns "Method", "Total Students", and "Graduation Rate".

Method	Total Students	Graduation Rate
Audition	831	93
Screened	2394	72
Ed. Opt.	2256	66

17. In the Sort dialog, select the following and click **Apply**.

Table 3: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Column	Direction	Null Sorting
School Name	Ascending	Default
Seats	Descending	Nulls Always Last
Graduation Date	Descending	Default



18.

19. Now that you have made all of these modifications to the Interactive Report, it is important to save the report layout. End users have the ability to save either *Private Reports*, only they can view, or *Public Reports*, that other end users can also view. *{Note - As a developer you can remove the ability for end users to save Public Reports by going to the report attributes in Page Designer.}*

As a developer you also have the ability to save the report as the Primary (default) Report, or an Alternative Report. For this exercise you will save the report as a named Alternative Report.

In the report, click **Actions**, select **Report**, and then select **Save Report**.

20. In the Save Report dialog, for Save(Only displayed for developers) select **As Default Report Settings**.

Note - End users can save Private and Public reports, however, only developers (who have run the app from the App Builder) can save the Primary and Alternative reports.

Save Report

Save (Only displayed for developers)

As Named Report

As Named Report

As Default Report Settings

Description

Cancel **Apply**

On Save Default Report, select **Alternative**, for Name enter **Best Schools**, and click **Apply**.

Save Default Report

The current report settings will be used as the default for all users.

Default Report Type

Primary

Alternative

Name

Best Schools

Cancel **Apply**

A new select list will be displayed at the top of the report which lists all of the saved reports available to the user.

21. To go back to how the end user will see the report when they first access the report, at the top of the report, select **1. Primary Report**. Click **Actions**, select **Report** and then select **Reset**.

The screenshot shows the 'NYC Highschools Report' interface. At the top, there is a search bar with a magnifying glass icon, a 'Go' button, and a dropdown menu labeled '1. Primary Report'. Below the search bar is a filter section for 'Neighborhood' with a dropdown arrow, a checked checkbox, and a list icon. The main content area displays three tables under neighborhood headings: 'Annadale-Huguenot-Princes Bay', 'Astoria', and 'Auburndale'. Each table has columns for 'Borough' and 'School Name'. The 'Astoria' table contains three rows: 'STATEN IS' (Tottenville High School), 'QUEENS' (Frank Sinatra School of the Arts High School), and 'QUEENS' (William Cullen Bryant High School). The 'Auburndale' table is currently empty. On the right side of the interface, a large 'Actions' dropdown menu is open. It includes options like 'Columns', 'Filter', 'Data', 'Format', 'Chart', 'Group By', 'Pivot', 'Report' (which is highlighted with a red box and a red number '2'), 'Save Report', 'Download', 'Reset' (which is also highlighted with a red box and a red number '2'), and 'Help'. The 'Report' and 'Reset' buttons are specifically highlighted with red boxes and circled numbers.

22. Click **Apply** to confirm reset. The changes you have made to the report will be reset and the original report will be displayed.

The screenshot shows the 'NYC Highschools Report' page. At the top, there is a blue header bar with the title 'NYC Highschools'. Below the header, the main title 'NYC Highschools Report' is centered. A search bar with a magnifying glass icon and a 'Go' button is located at the top left. To the right of the search bar are buttons for '1. Primary Report' and 'Actions'. In the center of the page, there is a modal dialog box titled 'Reset'. The dialog contains a circular arrow icon and the text 'Restore report to the default settings.' At the bottom of the dialog are two buttons: 'Cancel' and 'Apply', with 'Apply' being highlighted in red. On the left side of the main page, there is a table with columns 'Borough' and 'School Name'. One row in the table shows 'STATEN IS' and 'Tottenville High School'. Below this table, another section labeled 'Neighborhood: Astoria' is visible. The right side of the page shows some numerical data: '3,8' and 'Total Students'.

Task 2: Enhancing the Form

Form pages allow end users to readily update a single record of information. It is very common for these pages to be modal pages, whereby they display over the top of the original page, and the original page is greyed out and not accessible without first closing the modal page. Advantages of modal pages include that the same page can be called from numerous other pages, they include all of the processing, validations, and so forth within the page definition, and they are user friendly and make for a very straight forward user experience.

By default, the form pages generated by the Create Application Wizard are modal pages. The modal page for maintaining NYC Highschools takes up significant real estate. This could easily be improved by placing the Graduation Rate, Attendance Rate and College Career Rate on the same line. Lastly, the **Borough** allows any values to be entered, so you should restrict data entry by adding a select list of Borough Names.

1. In the Runtime environment, on the **NYC Highschools Report** page, click the **edit icon** for any record.

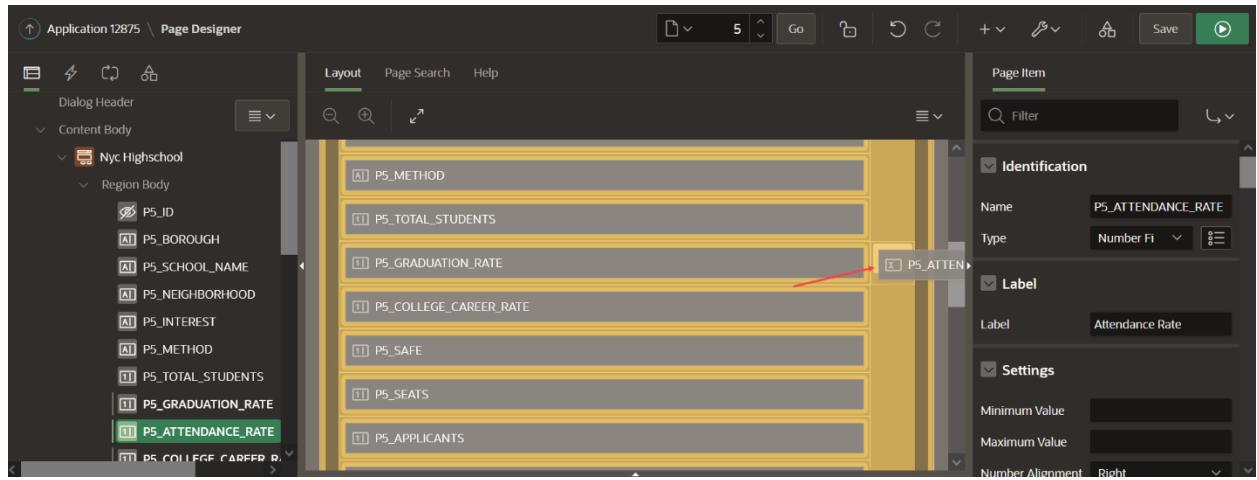
The modal form page for the selected record will be displayed.

2. In the Developer Toolbar, at the bottom of the screen, click **Edit Page 5**.

Note - If you have difficulties navigating using the Developer Toolbar, manually navigate to the browser tab for the APEX App Builder. If you are on the application home page, navigate to the page by clicking 5 - Nyc Highschool. If already on another page in Page Designer, use the page selector in the toolbar to navigate to page 5.

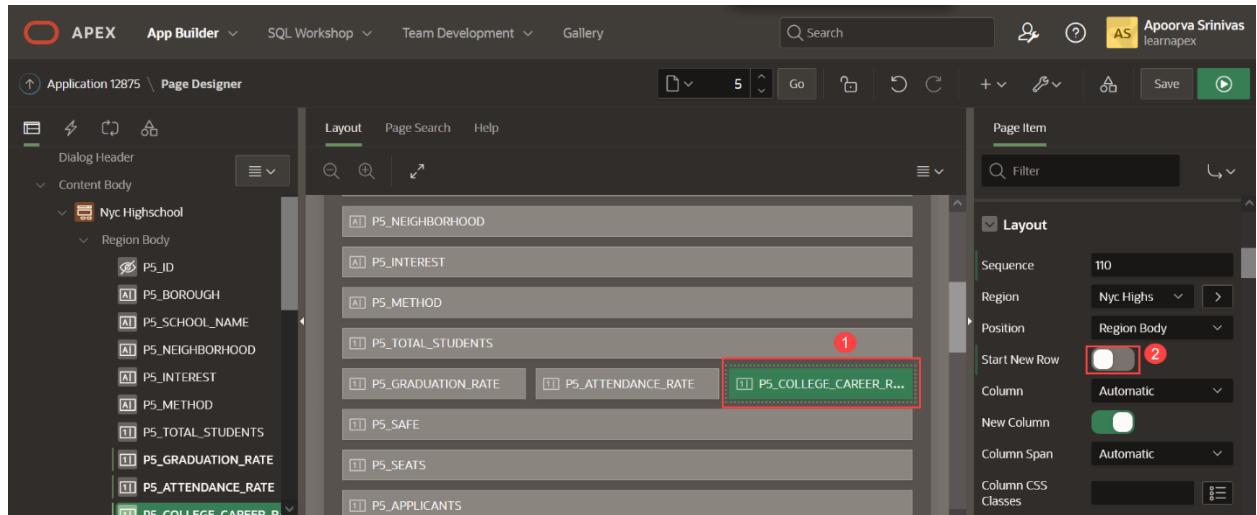
3. Items can readily be moved using drag-and-drop within Layout. If required you can also drag **new** components (regions, items, and buttons) from the Gallery, below Layout, into the Layout.

In Page Designer, with Page 5 loaded, within Layout (middle pane), click **P5_ATTENDANCE_RATE** and continue to hold the mouse down. Drag the item up and to the right, until it is directly after **P5_GRADUATION_RATE**, and a dark yellow box is displayed. Release the mouse to drop the item in the new location.



- As an alternative to using drag-and-drop you can also reposition items using attributes in the Property Editor.

In Page Designer, within Layout (or the Rendering tree in the left pane), select **P5_COLLEGE_CAREER_RATE**. In the Property Editor (right pane), deselect Layout > Start New Row.



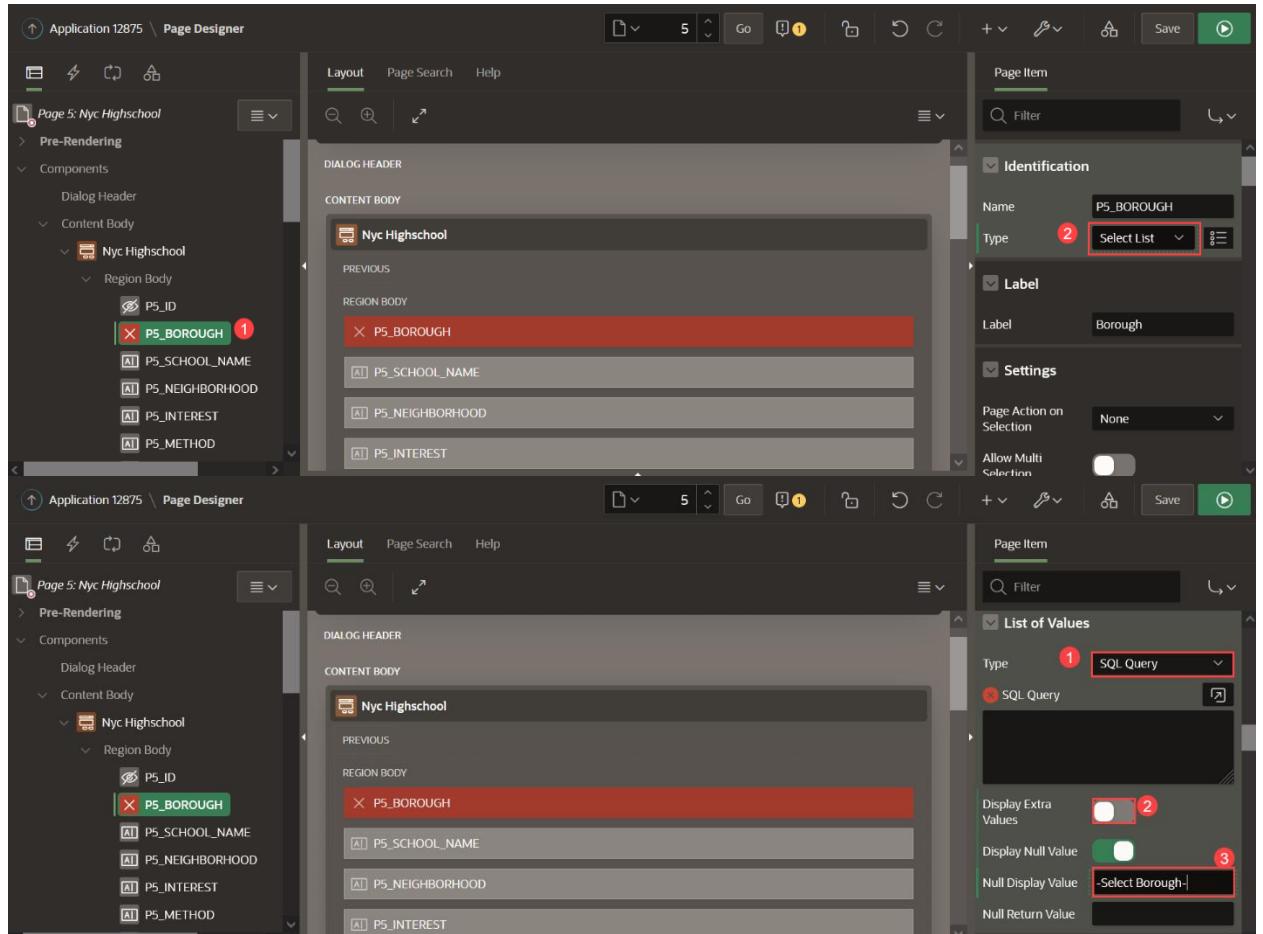
Note - As soon as you deselect Start New Row, the item will move to be on the same line as the item above, within Layout.

- To limit the data entry for an item, one of the simplest techniques is to convert a text item (which allows any data to be entered) into a select list.

In Page Designer, within the Rendering tree (left pane), select **P5_BOROUGH**. In the Property Editor (right pane), enter the following.

Table 4: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Group	Attribute	Value
Identification	Type	Select List
List of Values	Type	SQL Query
	Display Extra Values	Uncheck
	Null Display Value	Type in - Select Borough -



For List of Values > SQL Query enter the following code

```
Copyselect distinct borough d, borough r
from nyc_highschools
order by 1
```

List of Values

Type SQL Query ▾

SQL Query 

```
select distinct borough d, borough r  
from nyc_highschools  
order by 1
```

Display Extra Values 

Display Null Value 

Null Display Value -Select Borough-

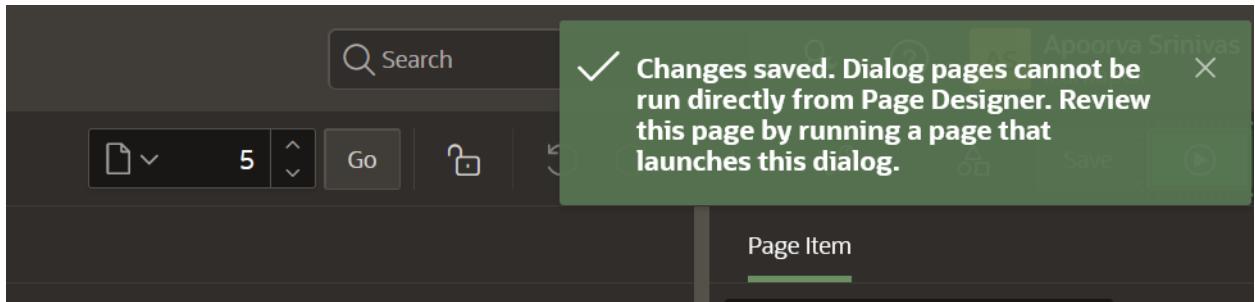
Null Return Value

6. It is important to save your changes before testing.

In Page Designer, within the toolbar (at the top), click **Save**.



Note - If you press Save and Run in the toolbar a message will be displayed, rather than the page being run. This is expected behavior, as modal pages can not be run directly from Page Designer.



7. Navigate back to the runtime environment and refresh the browser, or click **Cancel** on the modal page to return to the **NYC Highschools Report** page.
8. On the Project Tasks Report page, click the edit icon for any record.

Review the improved layout and click on **Borough** to see the list of available values.

School	Graduation Rate	Attendance Rate	College Career Rate
Academy of Televisi	91	86	62
Academy of Exploratory Board S			92
Academy and the Enviro			
Academy Environ			

Task 3: (OPTIONAL) Enhancing the UX of the Form

In the previous task, you explored a few options to enhance the form. In this task, we further enhance the user experience of the form by splitting the form fields into multiple tabs. Currently, observe that the form contains a number of fields and the user needs to scroll through the form to view all the fields.

1. In the Runtime environment, on the **NYC Highschools Report** page, click the **edit icon** for any record.

The screenshot shows a table with 16 columns. The columns are: Borough, School Name, Neighborhood, Interest, Method, Total Students, Graduation Rate, Attendance Rate, College Career Rate, Safe, Seats, Applicants, Dbn, Latitude, Longitude, and Lan Clas. The first row contains the column headers. The second row contains data for a school in the Bronx. The 'Borough' column has a red box around it. The 'School Name' column contains 'High School of American Studies at Lehman College'. The 'Neighborhood' column contains 'Van Cortlandt Village'. The 'Interest' column contains 'Humanities & Interdisciplinary'. The 'Method' column contains 'Test'. The 'Total Students' column contains '400'. The 'Graduation Rate' column contains '99'. The 'Attendance Rate' column contains '97'. The 'College Career Rate' column contains '100'. The 'Safe' column contains '99'. The 'Seats' column contains '10X696'. The 'Applicants' column contains '40.87'. The 'Dbn' column contains '-73.90'. The 'Latitude' column contains 'Fre'. The 'Longitude' column contains 'Jap'. The 'Lan Clas' column contains 'Lat Spd'.

	Borough	School Name	Neighborhood	Interest	Method	Total Students	Graduation Rate	Attendance Rate	College Career Rate	Safe	Seats	Applicants	Dbn	Latitude	Longitude	Lan Clas
	BRONX	High School of American Studies at Lehman College	Van Cortlandt Village	Humanities & Interdisciplinary	Test	400	99	97	100	99	10X696	40.87	-73.90	Fre	Jap	Lat Spd

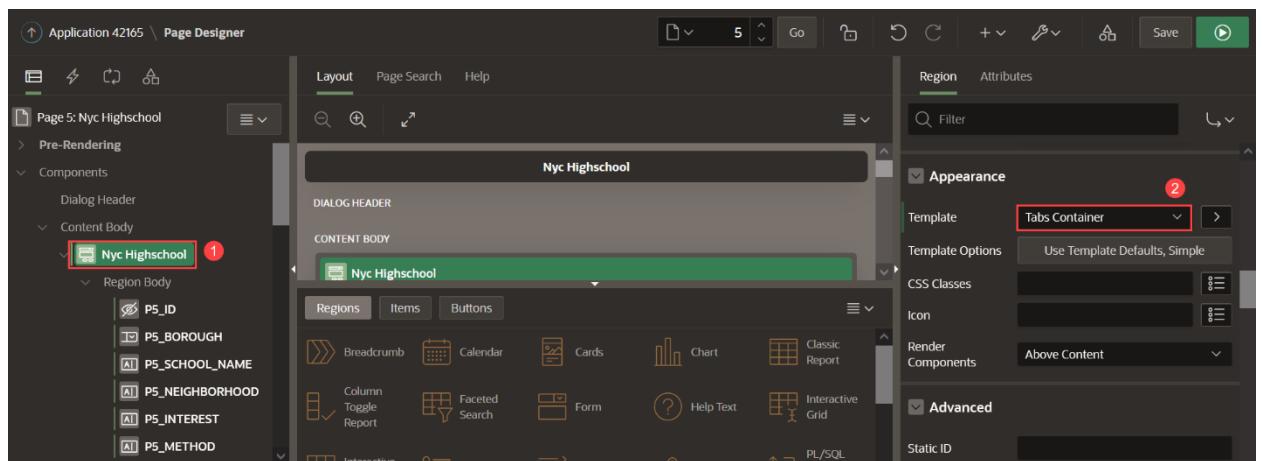
The modal form page for the selected record will be displayed.

2. In the Developer Toolbar, at the bottom of the screen, click **Edit Page 5**.



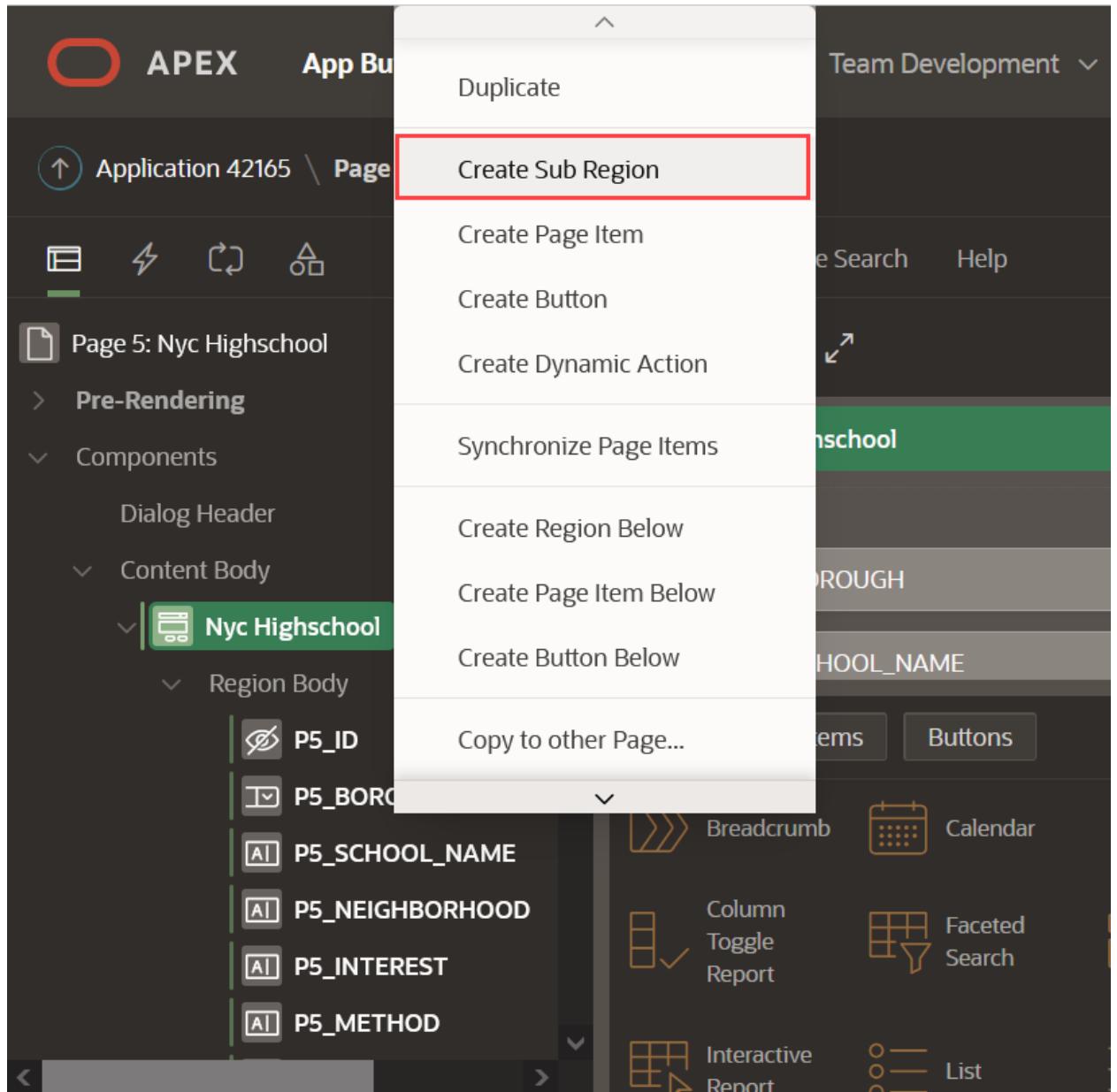
Note - If you have difficulties navigating using the Developer Toolbar, manually navigate to the browser tab for the APEX App Builder. If you are on the application home page, navigate to the page by clicking 5 - Nyc Highschool. If already on another page in Page Designer, use the page selector in the toolbar to navigate to page 5.

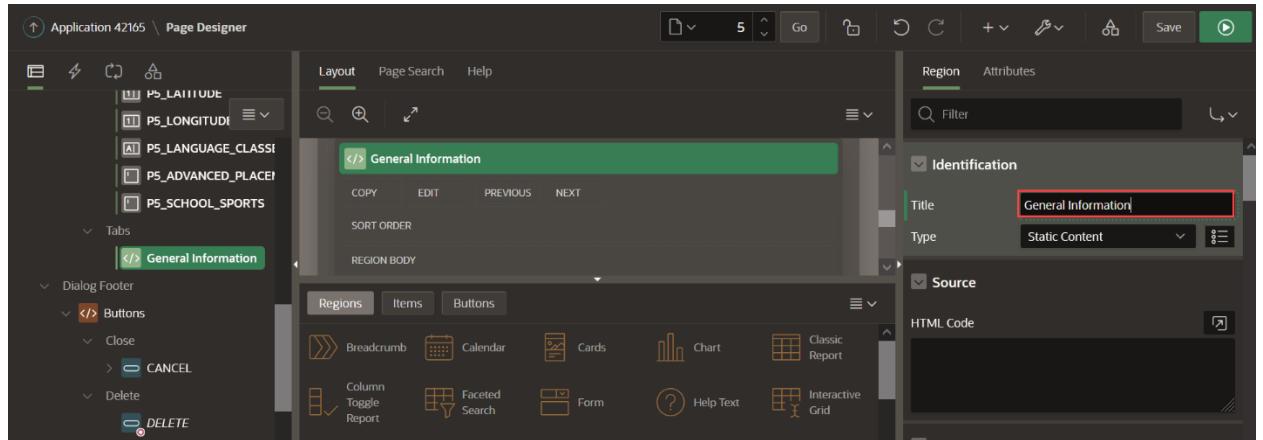
3. Click **Nyc Highschool** in the rendering tree. In the Property Editor, navigate to **Appearance** and for Template select **Tabs Container**.



4. To create a tab, right-click on **Nyc Highschool** and select **Create Sub Region**. Create 4 Sub Regions with the following values for **Title**:

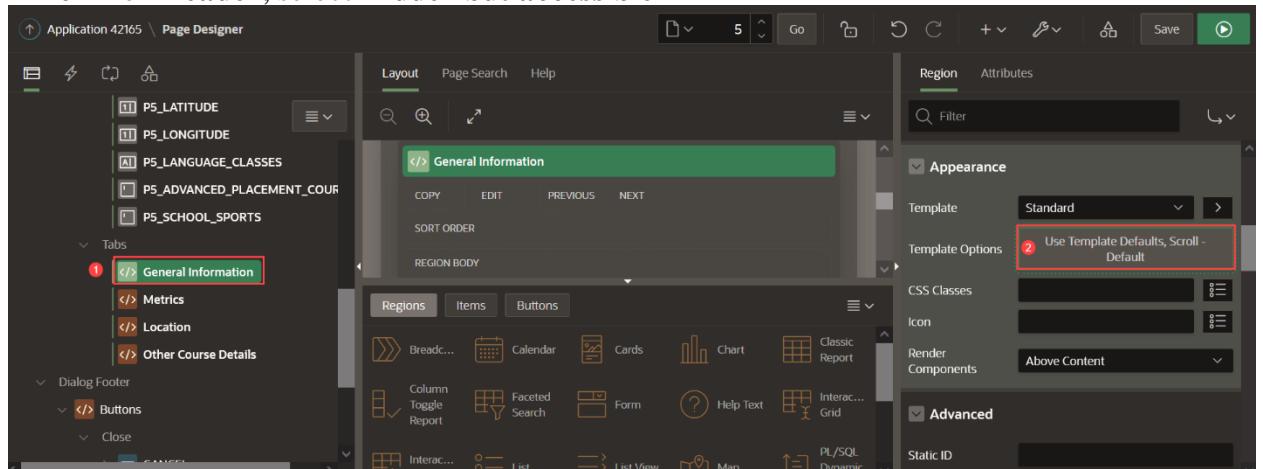
- General Information
- Metrics
- Location
- Other Course Details

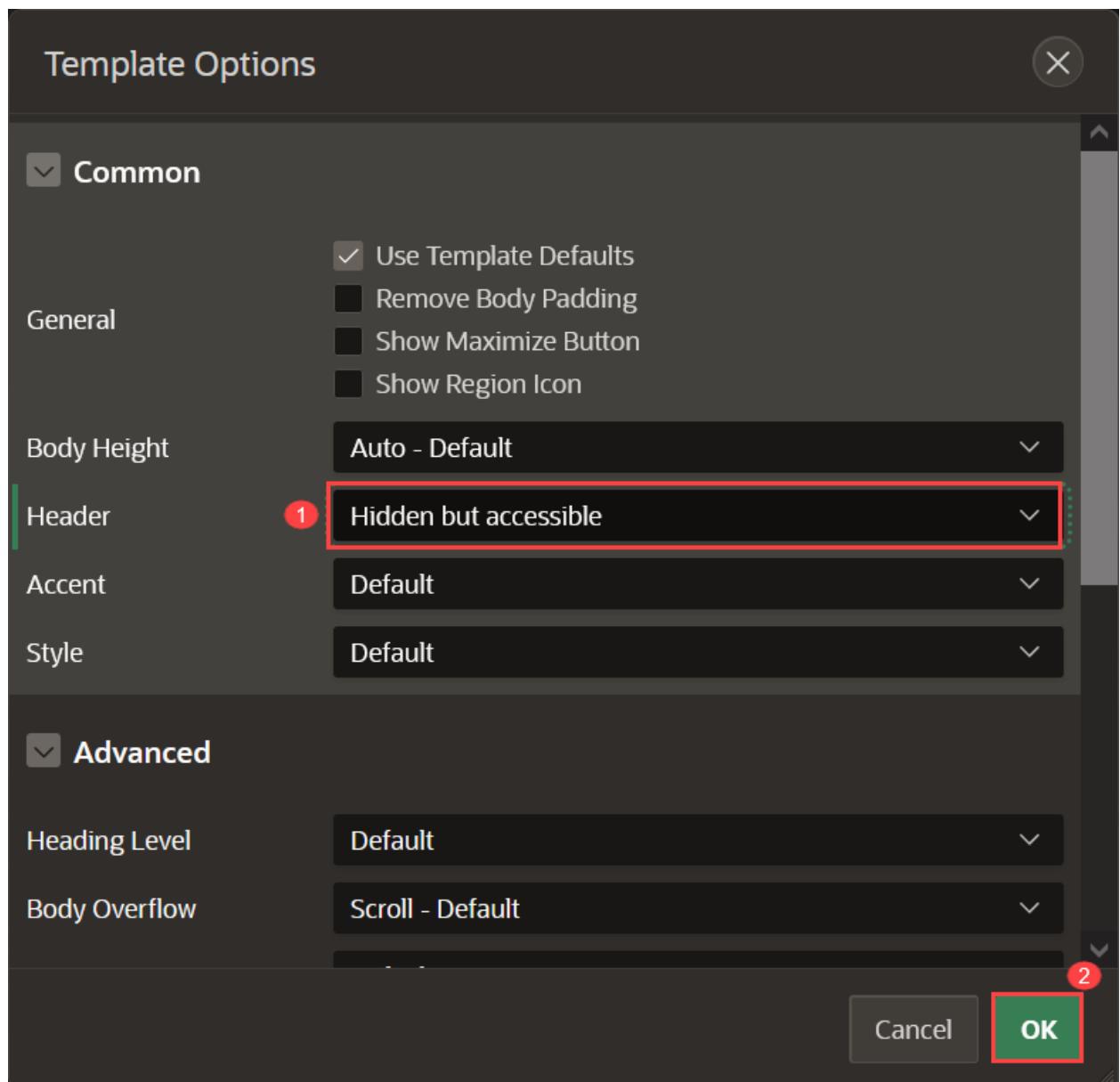




5. In the Property Editor for each Sub Region, perform the following step:

- Navigate to **Appearance**
- Select **Template Options**
- For **Header**, select **Hidden but accessible**





6. The Sub Regions created represents the different tabs. Drag and drop the form fields into their respective Sub Region as mentioned in the table.

Table 5: Building an App from a Spreadsheet using Oracle APEX | Lab 3: Improve the Report and Form

Sub Region Title	Form Fields
General Information	P5_BOROUGH P5_SCHOOL_NAME P5_NEIGHBORHOOD P5_INTEREST P5_METHOD
Metrics	P5_TOTAL_STUDENTS P5_GRADUATION_RATE P5_ATTENDANCE_RATE P5_COLLEGE_CAREER_RATE P5_SEATS P5_APPLICANTS P5_SAFE
Location	P5_LATITUDE P5_LONGITUDE
Other Course Details	P5_DBN P5_LANGUAGE_CLASSES P5_ADVANCED_PLACEMENT_COURSES P5 SCHOOL SPORTS

The screenshot shows the Oracle APEX App Builder Page Designer interface. On the left, a sidebar lists various database objects: P5_APPLICANTS, P5_DBN, P5_LATITUDE, P5_LONGITUDE, P5_LANGUAGE_CLASSES, P5_ADVANCED_PLACEMENT_COURSES, and P5_SCHOOL_SPORTS. Below this, under 'Tabs', are General Information, Metrics, Location, and Other Course Details. The 'General Information' tab is currently selected. On the right, a list of report items is displayed, including P5_BOROUGH, P5_SCHOOL_NAME, P5_NEIGHBORHOOD, P5_INTEREST, and P5_METHOD. The 'P5_NEIGHBORHOOD' item is highlighted with a red box. At the bottom of the page designer, there are several icons for different report types: Breadc..., Calendar, Cards, Chart, Classic Report, Column Toggle Report, Faceted Search, Form, Help Text, Interac..., and Interac... Grid. A PL/SQL icon is also present.

7.

- Click **Save** to save your changes. Go to the runtime application and refresh the application. On the **NYC Highschools Report** page, click the **edit icon** for any record. Click on various tabs to view the form fields.

The screenshot shows the runtime application for the NYC Highschools Report. On the left, a table displays data with columns: Borough, School Name, Neighborhood, Interest, and Method. One row is selected, showing 'BRONX' in the Borough column and an edit icon. A modal dialog box titled 'Nyc Highschool' is open over the table. The dialog has tabs: General Information (which is active and highlighted in blue), Metrics, Location, and Other Course Details. Inside the dialog, there are four input fields:

- Borough: BRONX
- School Name: High School of American Studies at Lehman College
- Neighborhood: Van Cortlandt Village
- Interest: Humanities & Interdisciplinary

At the bottom of the dialog are 'Cancel' and 'Delete' buttons, and a large 'Apply Changes' button on the right.

Summary

You now know how *end-users* can define custom reports using Interactive Reports, and you can easily improve form pages.

Using Maps and Progressive Web App

Introduction

In this lab, you learn to add a map region to the search page in order to visually enhance the page. The search page includes facets on the left which can readily be used to limit the data shown in the map on the right. Once the final application is built, you learn to download and use the application as a Progressive Web App (PWA).

Estimated Time: 10 minutes

Collapse All Tasks

Task 1: Creating a Copy of an Existing Page

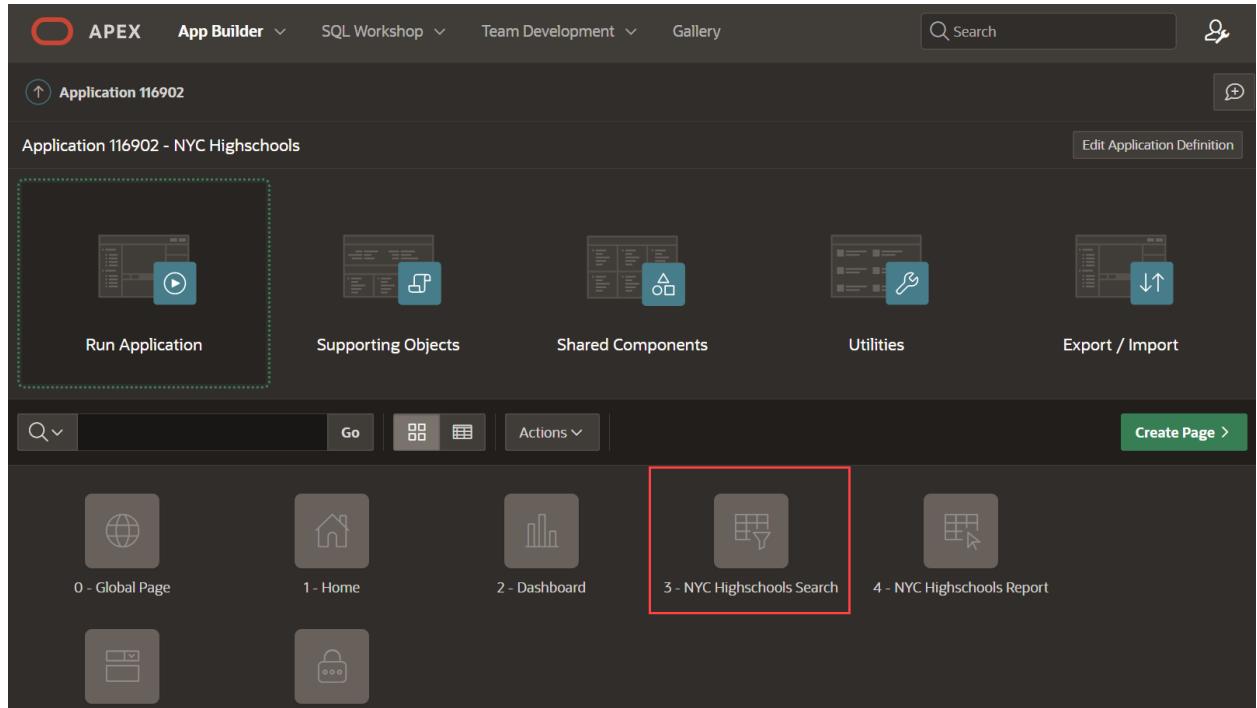
In order to implement the map, we will copy the existing **NYC Highschools Search** page and modify the new page to include the Map region.

1. From the runtime application, go to the search page by clicking **NYC Highschools Search**. Assuming that you ran this app from the APEX App Builder, a Developer Toolbar is displayed at the bottom of the screen. *Note - End users who log directly into the app will not see this toolbar.*

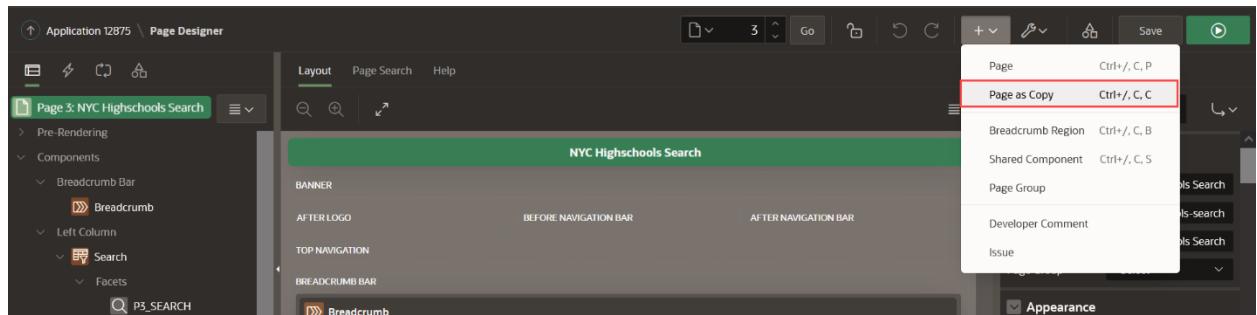
In the Developer Toolbar click **Page 3**.

The screenshot shows the 'NYC Highschools Search' page in the APEX App Builder. The left sidebar contains navigation links: Home, Dashboard, and two items under 'NYC Highschools': 'NYC Highschools Search' (which is highlighted with a red border) and 'NYC Highschools Report'. The main content area is titled 'NYC Highschools Search' and displays a table with a total row count of 427. The table has columns for Borough, School Name, Neighborhood, Interest, Method, Total Students, Graduation Rate, and Attendance Rate. Below the table, there are two facets: 'Method' and 'Borough'. The 'Method' facet shows categories like Ed. Opt., Screened, Open, etc. The 'Borough' facet shows categories like BROOKLYN, BRONX, MANHATTAN. At the bottom of the page, there is a developer toolbar with buttons for Home, App 116902, Page 3 (which is highlighted with a red border), Session, Debug, Quick Edit, Customize, and Help.

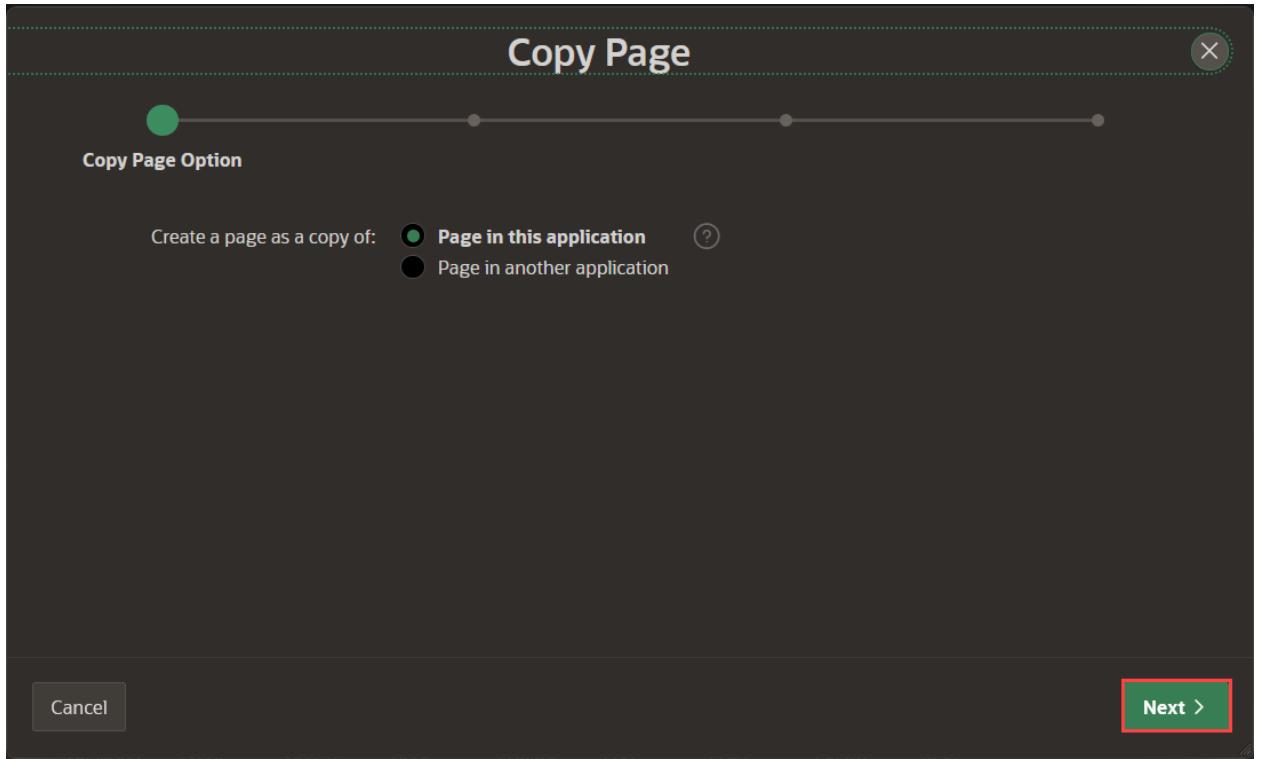
Alternatively, you can also navigate back to the APEX App Builder tab in your browser manually by selecting the appropriate browser tab or window. Once in the App Builder click **3 - NYC Highschools Search**.



2. To create a page similar to the existing page, click the + icon next to the redo button at the top right corner. Select **Page as Copy**.



3. A Copy Page dialog appears. For Create a page as a Copy of, select **Page in this application** and click **Next**.



4. For Page to Copy, enter the following:
 - For New Page Name, enter **NYC Highschools Map**
 - For Breadcrumb, select the Breadcrumb option
 - For Entry Name - accept the default value or enter **NYC Highschools Map** Accept the default values for other fields and click **Next**.

Copy Page

Page to Copy

Application: 116902

* Copy From Page: 3. NYC Highschools Search

* New Page Number: 6

* New Page Name: NYC Highschools Map

Breadcrumb: Breadcrumb

Parent Entry: No parent entry

Entry Name: NYC Highschools Map

[Next >](#)

- Under Navigation Menu, select **Create a new navigation menu entry** and click **Next**. This creates a new entry in the left side navigation menu of your application.

Copy Page

Navigation Menu

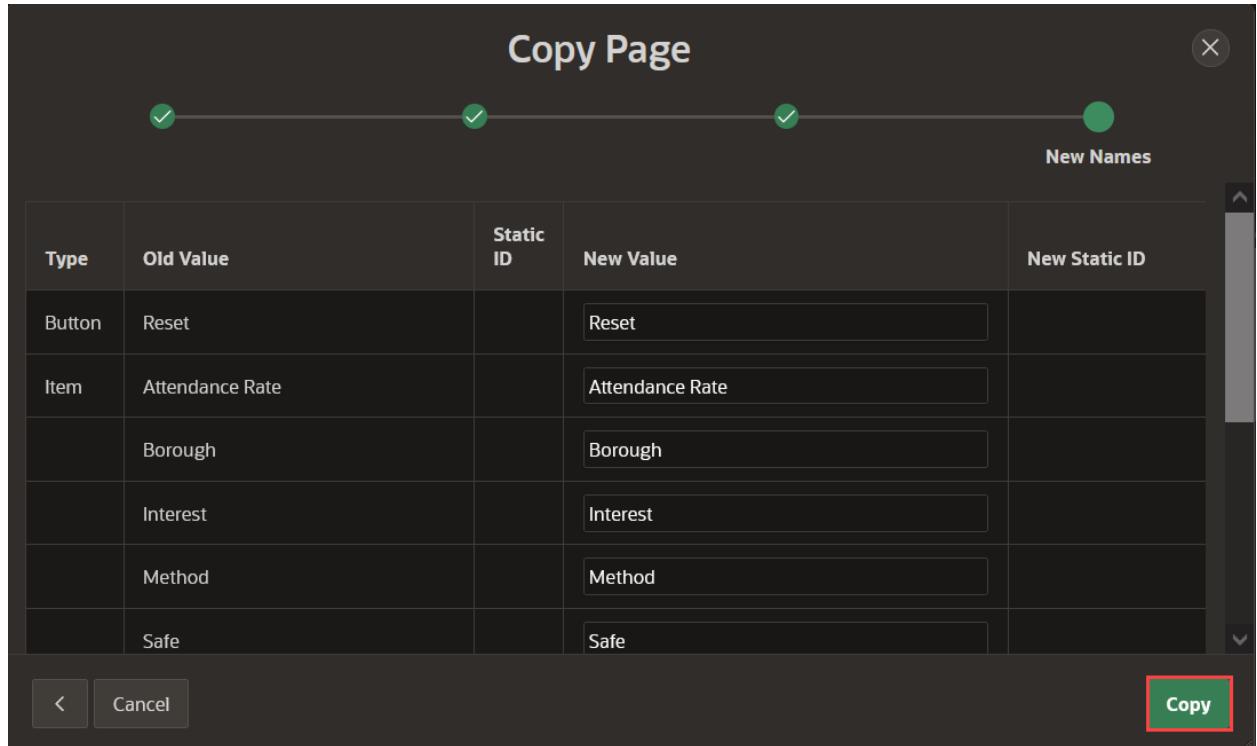
Navigation Preference: Create a new navigation menu entry

* New Navigation Menu Entry: NYC Highschools Map

Parent Navigation Menu Entry: - No parent selected -
Home
Dashboard
NYC Highschools Search
NYC Highschools Report

[Next >](#)

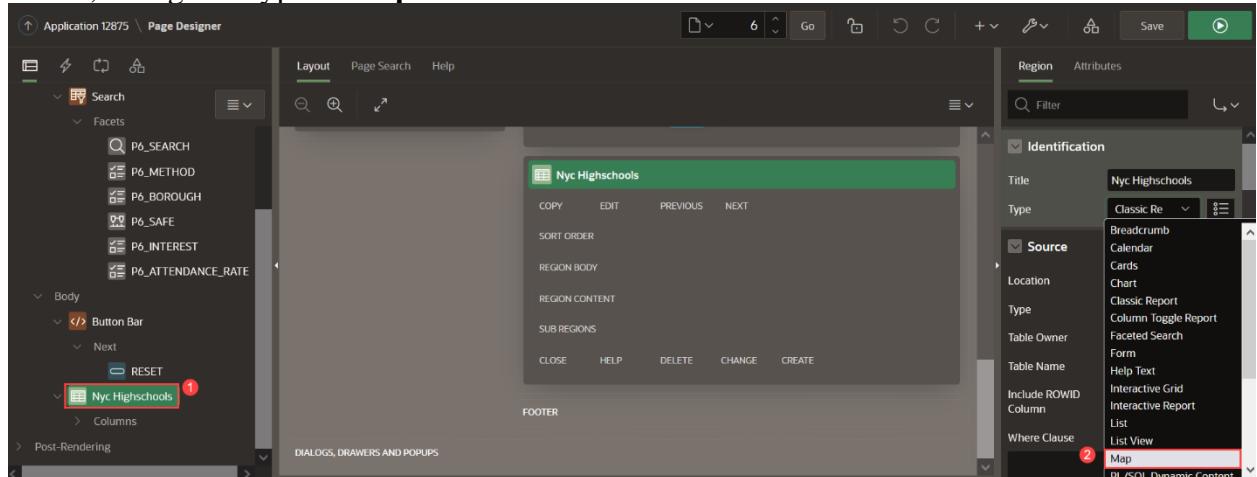
- Under New Names, you can enter new names for the items and buttons. Accept the default names and click **Copy**.



A new page called **NYC Highschools Map** is created as Page 6.

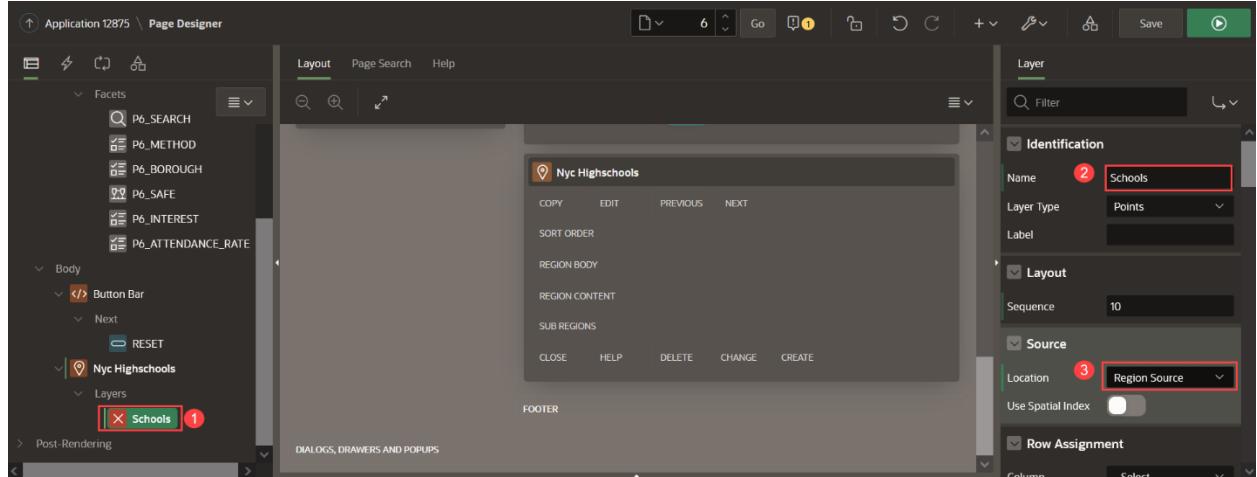
Task 2: Adding a Map Region

- The newly created Page 6, **NYC Highschools Map** opens in the Page Designer. In the Rendering pane, navigate to Body and select the **Nyc Highschools** region. In the Property Editor, change the type to **Map**.



2. To customize a map region, you need to add layers. Under Layers, click on **New**. In the property editor, perform the following:

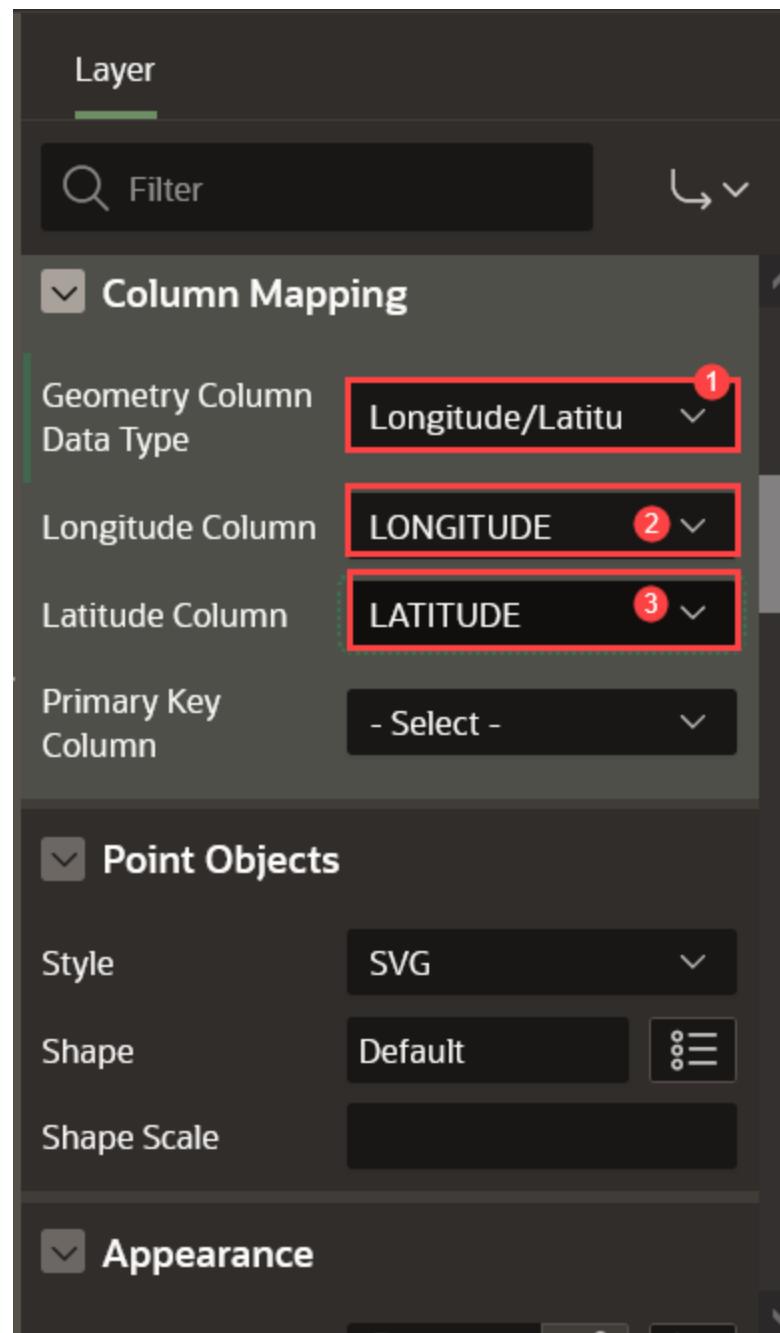
- For Name, enter **Schools**
- For Source > Location, select **Region Source**. This indicates that the layer fetches the data from its parent region (Nyc Highschools) whose source is the local database table **NYC_HIGHSCHOOLS**.



3. In order to display the points on the map, you need to provide the coordinates. In the Property Editor, go to the **Column Mapping** group. Enter the following values:

Table 1: Building an App from a Spreadsheet using Oracle APEX | Lab 4: Add a Map Region and Install PWA

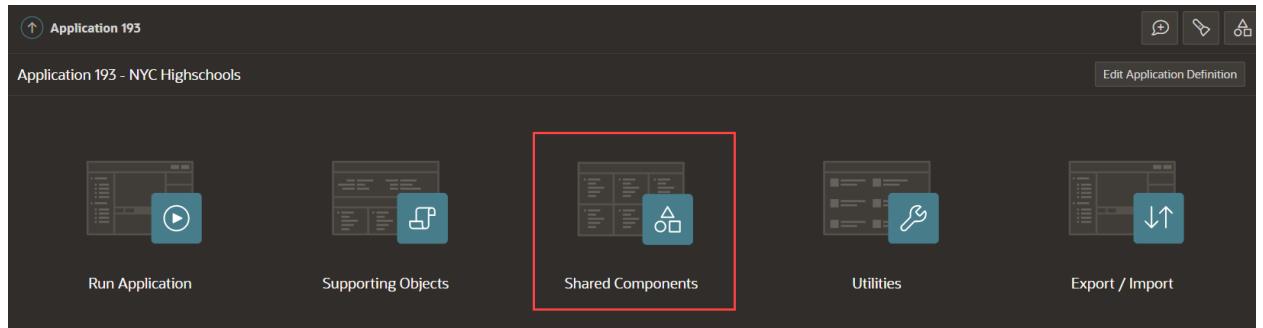
Property	Value
Geometry Column Data Type	Longitude/Latitude
Longitude Column	Longitude
Latitude Column	Latitude



- 4.
5. Click on **Save**. Later, click on **Application ** at the top to navigate to the application home page.



6. Let us set an icon for the newly created **NYC Highschools Map**. Click on **Shared Components**.



7. Under Navigation, select **Navigation Menu**. Under Lists, select **Navigation Menu**.



Application 193 \ Shared Components

Application Logic



Application Definition

Application Items

Application Processes

Application Computations

Application Settings

Build Options

1

Navigation



Lists

3

Navigation Menu

Breadcrumbs

1

Navigation Bar List

The screenshot shows the Oracle APEX Lists page. The top navigation bar includes tabs for Lists, Unused, Conditional Entries, Subscription, Utilization, and History. Below the navigation bar is a search bar with a Go button and a toolbar with icons for Reset, Copy, and Create. The main content area displays a table titled 'Navigation Menu'. The table has columns: Name, Type, Entries, References, Updated, Navigation Bar, Navigation Menu, Subscribed From, and Subscribers. One row is visible, showing 'Navigation Menu' as the name, 'Static' as the type, 5 entries, 1 reference, and 'No' in the Navigation Bar column. The 'Navigation Menu' column is highlighted with a red border.

Name	Type	Entries	References	Updated	Navigation Bar	Navigation Menu	Subscribed From	Subscribers
Navigation Menu	Static	5	1	-	No	Yes	-	-

8. Click the edit icon next to **NYC Highschools Map** list entry.

The screenshot shows the Oracle APEX List Details page for the 'Navigation Menu' entry. The top navigation bar includes tabs for Show All, Name, List Entries, Subscription, Configuration, and Comments. The 'Name' tab is selected. The main content area shows the 'Name' field set to 'Navigation Menu'. Below it is a table titled 'List Entries' with columns: Sequence, Name, Target, Icon, Authorization Scheme, Build Option, Level, Parent Entry, and Child Entries. Five entries are listed: Home (Sequence 10, Target f?p=&APP_ID.:1:&APP_SESSION.:&DEBU..., Icon fa-home), Dashboard (Sequence 20, Target f?p=&APP_ID.:2:&APP_SESSION.:&DEB..., Icon fa-dashboard), NYC Highschools Search (Sequence 30, Target f?p=&APP_ID.:3:&APP_SESSION.:&DEB..., Icon fa-table-search), NYC Highschools Report (Sequence 40, Target f?p=&APP_ID.:4:&APP_SESSION.:&DEB..., Icon fa-table), and NYC Highschools Map (Sequence 50, Target f?p=&APP_ID.:6:&APP_SESSION.:&DEB..., Icon -). The edit icon for the 'NYC Highschools Map' entry is highlighted with a red box. At the bottom right, there are 'Cancel', 'Delete', and a green 'Apply Changes' button.

List: Navigation Menu								
Show All Name List Entries Subscription Configuration Comments Cancel Delete Apply Changes								
Name								
* Name <input type="text" value="Navigation Menu"/>								
List Entries								
Search: All Text Columns		Go	Actions ▾	Edit	Add Entry			Create Entry >
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sequence ↑↓	Name	Target	Icon	Authorization Scheme	Build Option	Level ↑↓	Parent Entry	Child Entries
10	Home	f?p=&APP_ID.:1:&APP_SESSION.:&DEBU...	fa-home			1		
20	Dashboard	f?p=&APP_ID.:2:&APP_SESSION.:&DEB...	fa-dashboard			1		
30	NYC Highschools Search	f?p=&APP_ID.:3:&APP_SESSION.:&DEB...	fa-table-search			1		
40	NYC Highschools Report	f?p=&APP_ID.:4:&APP_SESSION.:&DEB...	fa-table			1		
50	NYC Highschools Map	f?p=&APP_ID.:6:&APP_SESSION.:&DEB...	-			1		

9. In the edit page, for Image/Class enter **fa-map-marker** and click **Apply Changes**.

The screenshot shows the Oracle APEX List Entry Create/Edit page for the 'NYC Highschools Map' entry. The top navigation bar includes tabs for Show All, Entry, Target, Current List Entry, Conditions, Authorization, Configuration, Click Counting, User Defined Attributes, and Developer Resources. The 'Entry' tab is selected. The main content area shows the 'List' dropdown set to 'Navigation Menu'. The 'Image/Class' input field contains 'fa-map-marker' and is highlighted with a red box. There are also fields for 'Attributes' and 'Alt Attribute'. At the bottom right, there are 'Cancel', 'Delete', and a green 'Apply Changes' button. A red circle with the number '2' is positioned above the 'Apply Changes' button.

List: Navigation Menu

Parent List Entry: No Parent List Item

Sequence: 50

Image/Class: fa-map-marker

Attributes:

Alt Attribute:

List Entry Label: NYC Highschools Map

10. Click **Run Page**. The **NYC Highschools Map** is displayed with a faceted search on the left and a map region on the right. Filter the values using faceted search and observe how the map changes accordingly.

Sequence	Name	Target	Icon	Authorization Scheme	Build Option	Level	Parent Entry
10	Home	?p=&APP_ID::1&APP_SESSION::&DEBUG::	fa-home			1	
20	Dashboard	?p=&APP_ID::2&APP_SESSION::&DEBUG::	fa-dashboard			1	
30	NYC Highschools Search	?p=&APP_ID::3&APP_SESSION::&DEBUG::	fa-table-search			1	
40	NYC Highschools Report	?p=&APP_ID::4&APP_SESSION::&DEBUG::	fa-table			1	
50	NYC Highschools Map	?p=&APP_ID::6&SESSION::&DEBUG::::	fa-map-marker			1	

Task 3: Enhancing the Map Region

APEX allows customization of the map in a declarative way. In this step, you will enhance the map by adding tooltip and custom pin colors on the map.

- From the **NYC Highschools Map** page in the application, click **Page 6** in the developer toolbar to edit the page.



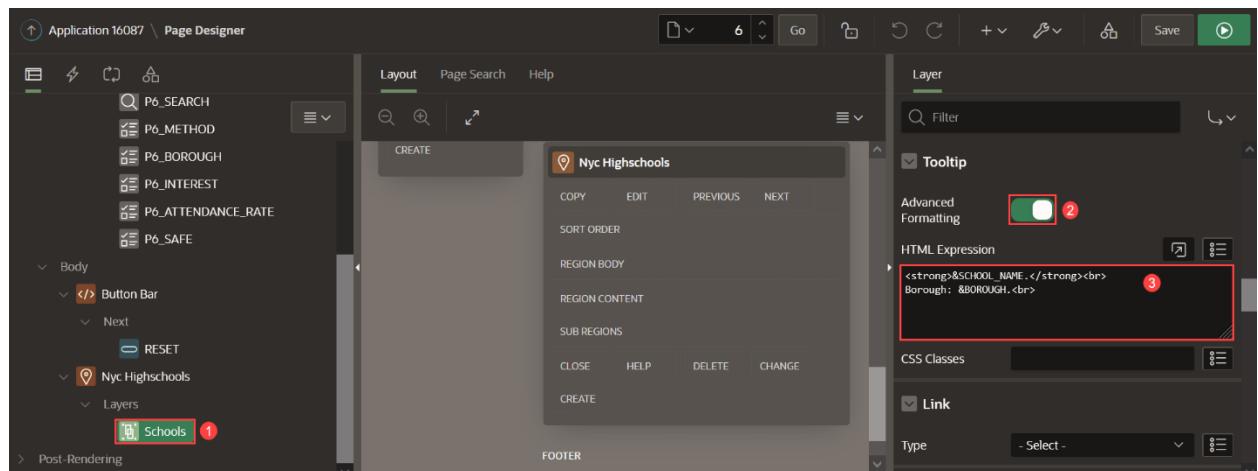
2. In the Rendering tree, navigate to **Nyc Highschools** under Body and select the **Schools** layer.

In the Property Editor, do the following:

- Under Tooltip, toggle the button to switch on **Advanced Formatting**.
- In the **HTML Expression** text area, enter the following HTML snippet:

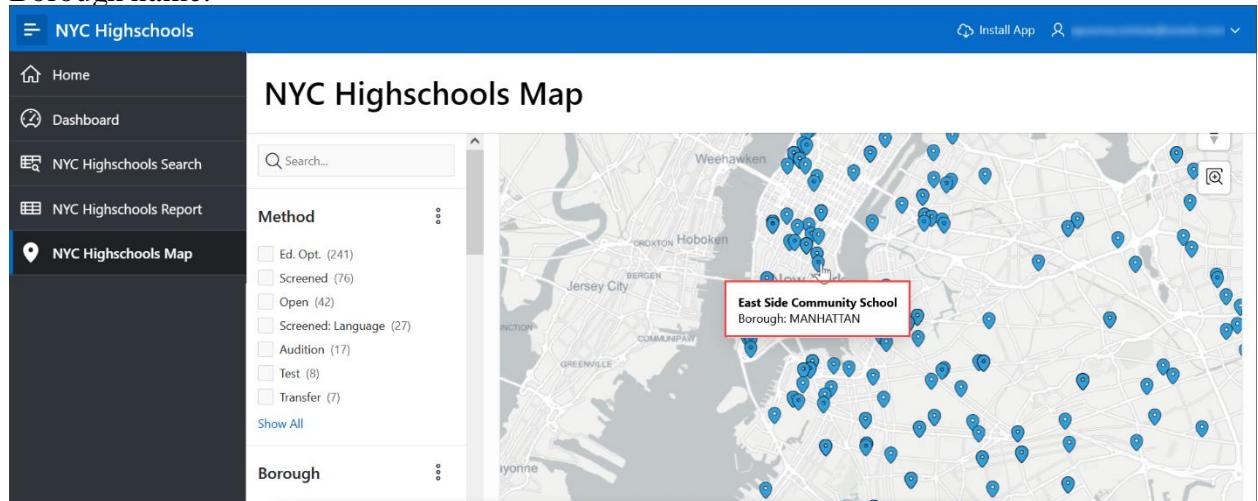
○ Copy `&SCHOOL_NAME .
`

Borough: &BOROUGH .



3.

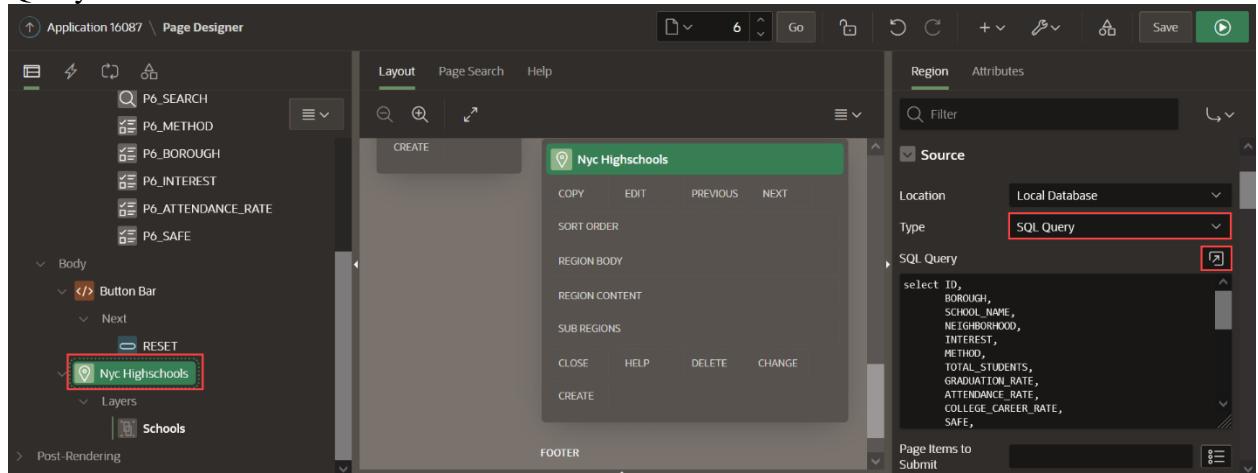
4. Click **Save and Run Page**. The NYC Highschools Map is displayed. Hover over a pin in the map to display the custom tooltip. The tooltip displays the Highschool name and the Borough name.



5. Now, you will customize the map by adding a condition such that the value of the ***GRADUATION_RATE*** will determine the pin color. To do so, click **Page 6** in the developer toolbar to edit the page.



6. In the Rendering tree, navigate to **Nyc Highschools** under Body. In the Property Editor, under Source, select **SQL Query** for Type. Click on the Code Editor button next to SQL Query.



7. In the Code Editor, modify the SQL query to add a CASE statement to determine the color based on the value of ***GRADUATION_RATE***. Replace the query with the following query:

```
8. Copyselect ID,
9.           BOROUGH,
10.          SCHOOL_NAME,
11.          NEIGHBORHOOD,
12.          INTEREST,
13.          METHOD,
14.          TOTAL_STUDENTS,
15.          GRADUATION_RATE,
```

```
16.      ATTENDANCE_RATE,  
17.      COLLEGE_CAREER_RATE,  
18.      SAFE,  
19.      SEATS,  
20.      APPLICANTS,  
21.      DBN,  
22.      LATITUDE,  
23.      LONGITUDE,  
24.      LANGUAGE_CLASSES,  
25.      ADVANCED_PLACEMENT_COURSES,  
26.      SCHOOL_SPORTS,  
27.      CASE WHEN GRADUATION_RATE BETWEEN 0 and 50 then  
'red'  
28.      WHEN GRADUATION_RATE BETWEEN 50 and 75 then  
'yellow'  
29.      WHEN GRADUATION_RATE BETWEEN 75 and 100 then  
'green' END as PIN_COLOR
```

```
from NYC_HIGHSCHOOLS
```

Click **OK**.

The screenshot shows a "Code Editor - SQL Query" window. The query code is as follows:

```
1 select ID,
2       BOROUGH,
3       SCHOOL_NAME,
4       NEIGHBORHOOD,
5       INTEREST,
6       METHOD,
7       TOTAL_STUDENTS,
8       GRADUATION_RATE,
9       ATTENDANCE_RATE,
10      COLLEGE_CAREER_RATE,
11      SAFE,
12      SEATS,
13      APPLICANTS,
14      DBN,
15      LATITUDE,
16      LONGITUDE,
17      LANGUAGE_CLASSES,
18      ADVANCED_PLACEMENT_COURSES,
19      SCHOOL_SPORTS,
20      CASE WHEN GRADUATION_RATE BETWEEN 0 and 50 then 'red'
21      WHEN GRADUATION RATE BETWEEN 50 and 75 then 'yellow'
```

The "OK" button at the bottom right of the editor is highlighted with a red box.

30. Select **Schools** layer in the Rendering pane. In the Property Editor, do the following:

- For **Name**, enter **Schools - Red**
- Under **Row Assignment**,
 - For **Column**, select **PIN_COLOR**
 - For **Value for this Layer**, enter **red**
- Under **Appearance**, for Fill Color enter **&PIN_COLOR**.

The screenshot shows a user interface for building web pages, likely a component-based editor. The left side features a tree view of the page structure, and the right side shows a preview area with various UI components.

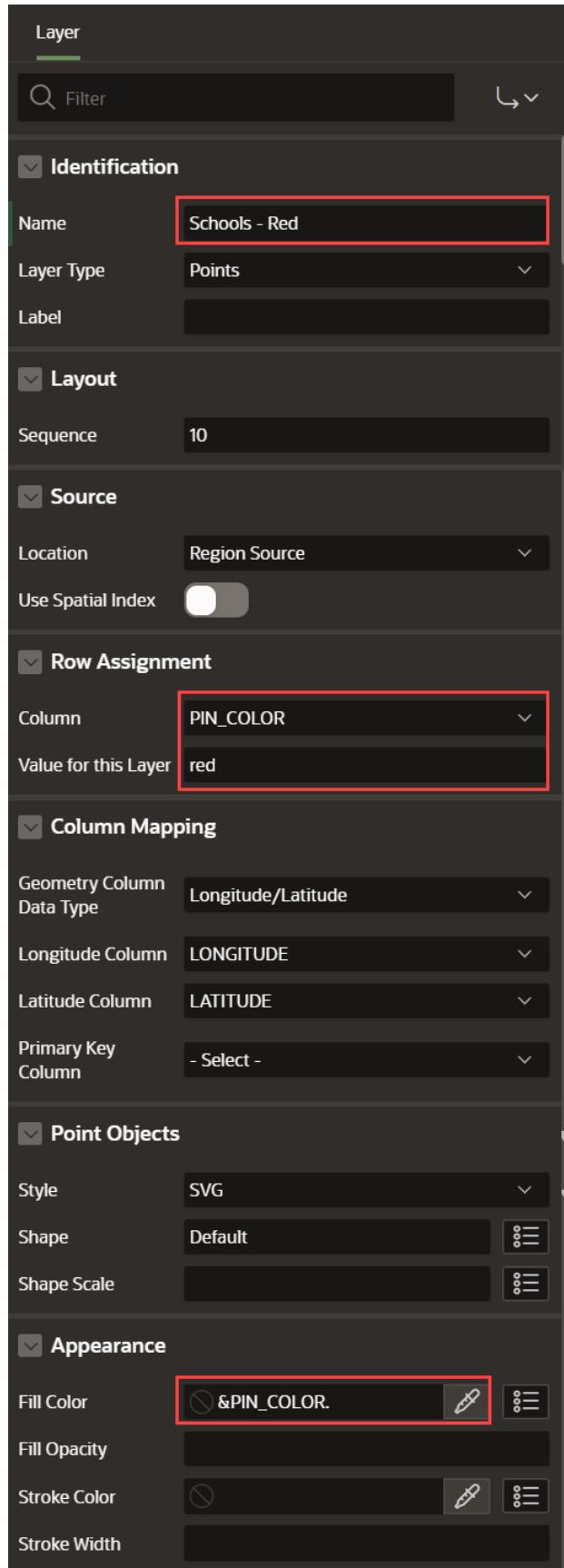
Page Components:

- Breadcrumb Bar:** Contains a **Breadcrumb** component.
- Left Column:** Contains a **Search** component, which has a **Facets** section. The facets listed are:
 - P6_SEARCH
 - P6_METHOD
 - P6_BOROUGH
 - P6_SAFE
 - P6_INTEREST
 - P6_ATTENDANCE_RATE
- Body:** Contains a **Button Bar**, which includes a **RESET** button and a **Nyc Highschools** component. The **Nyc Highschools** component has a **Schools** sub-component, which is highlighted with a red border.
- Post-Rendering:** This section is currently empty.

Preview Area:

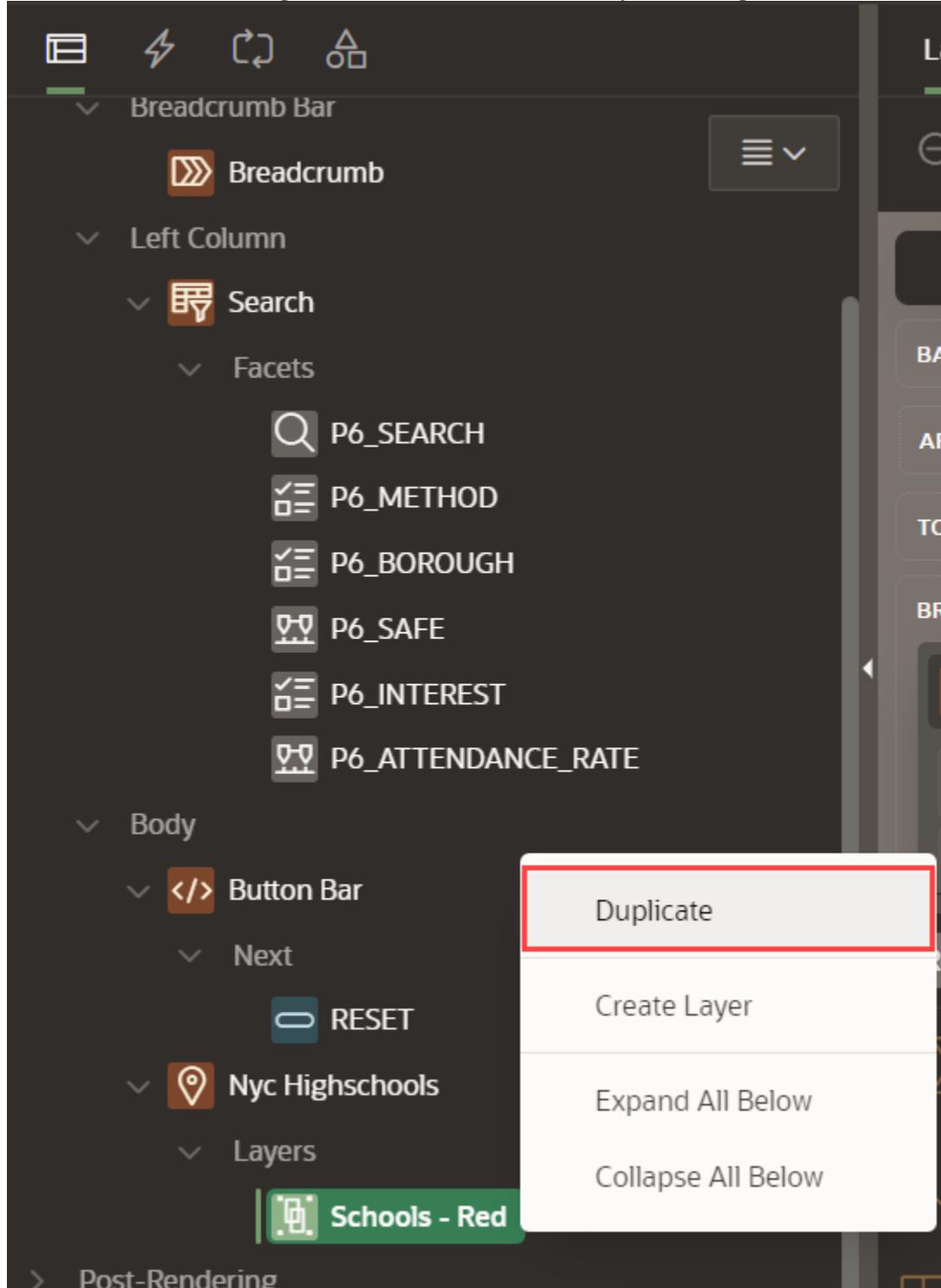
The preview area on the right displays a dark-themed user interface with the following elements:

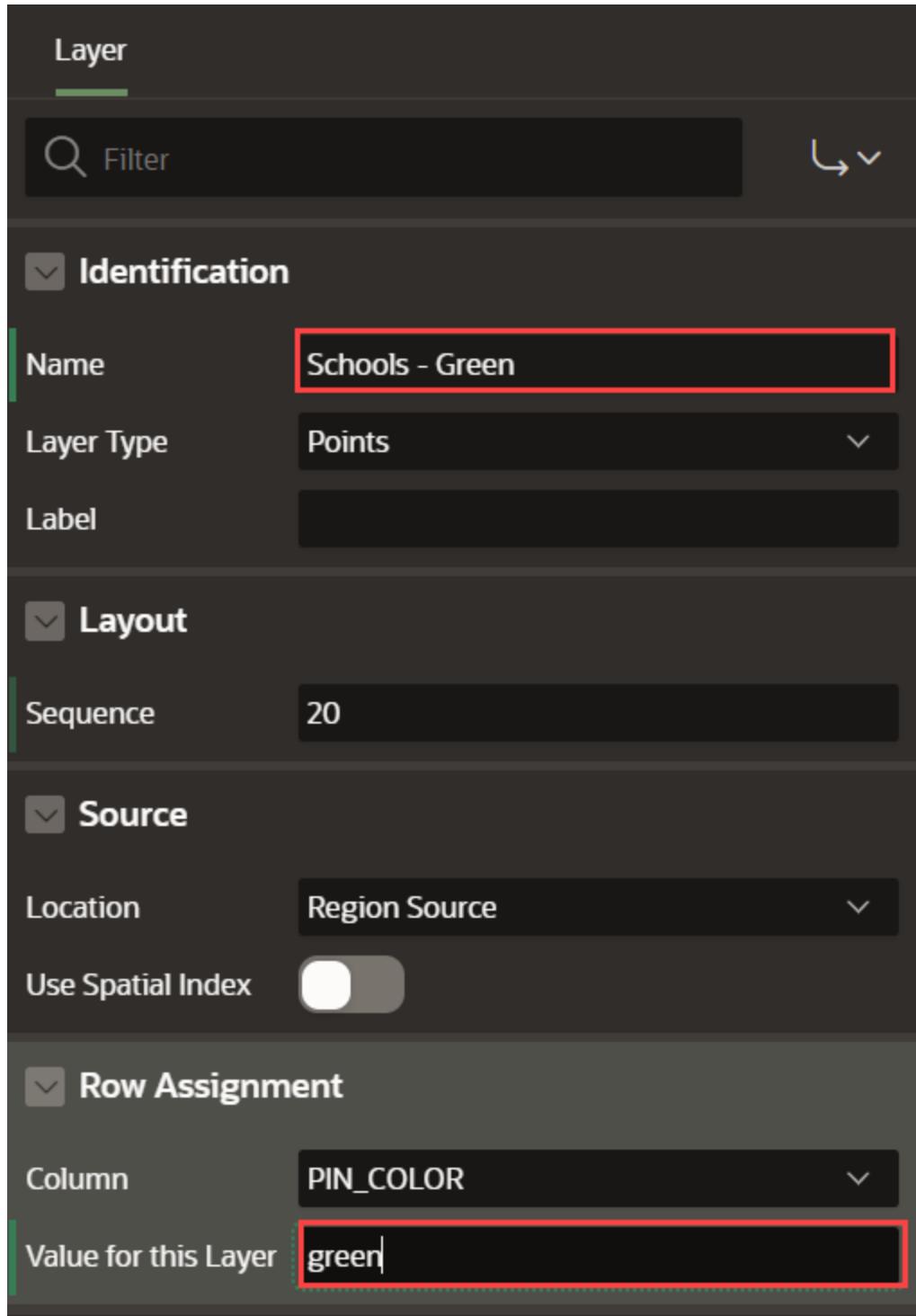
- A top navigation bar with icons for file operations (New, Save, Undo, Redo).
- A **Breadcrumb Bar** showing the current path.
- A **Breadcrumb** component.
- A **Search** component with a magnifying glass icon.
- A **Facets** section containing six items: P6_SEARCH, P6_METHOD, P6_BOROUGH, P6_SAFE, P6_INTEREST, and P6_ATTENDANCE_RATE, each with a corresponding icon.
- A **Button Bar** with a **RESET** button.
- A **Nyc Highschools** component with a location pin icon.
- A **Schools** component, which is highlighted with a red border.



31. In the Rendering Pane, right-click on **Schools - Red** and select **Duplicate**. In the Property Editor, do the following:

- For Name, enter **Schools - Green**
- Under **Row Assignment**, for **Value for this Layer**, enter **green**





32. In the Rendering Pane, right-click on **Schools - Green** and select **Duplicate**. In the Property Editor, do the following:

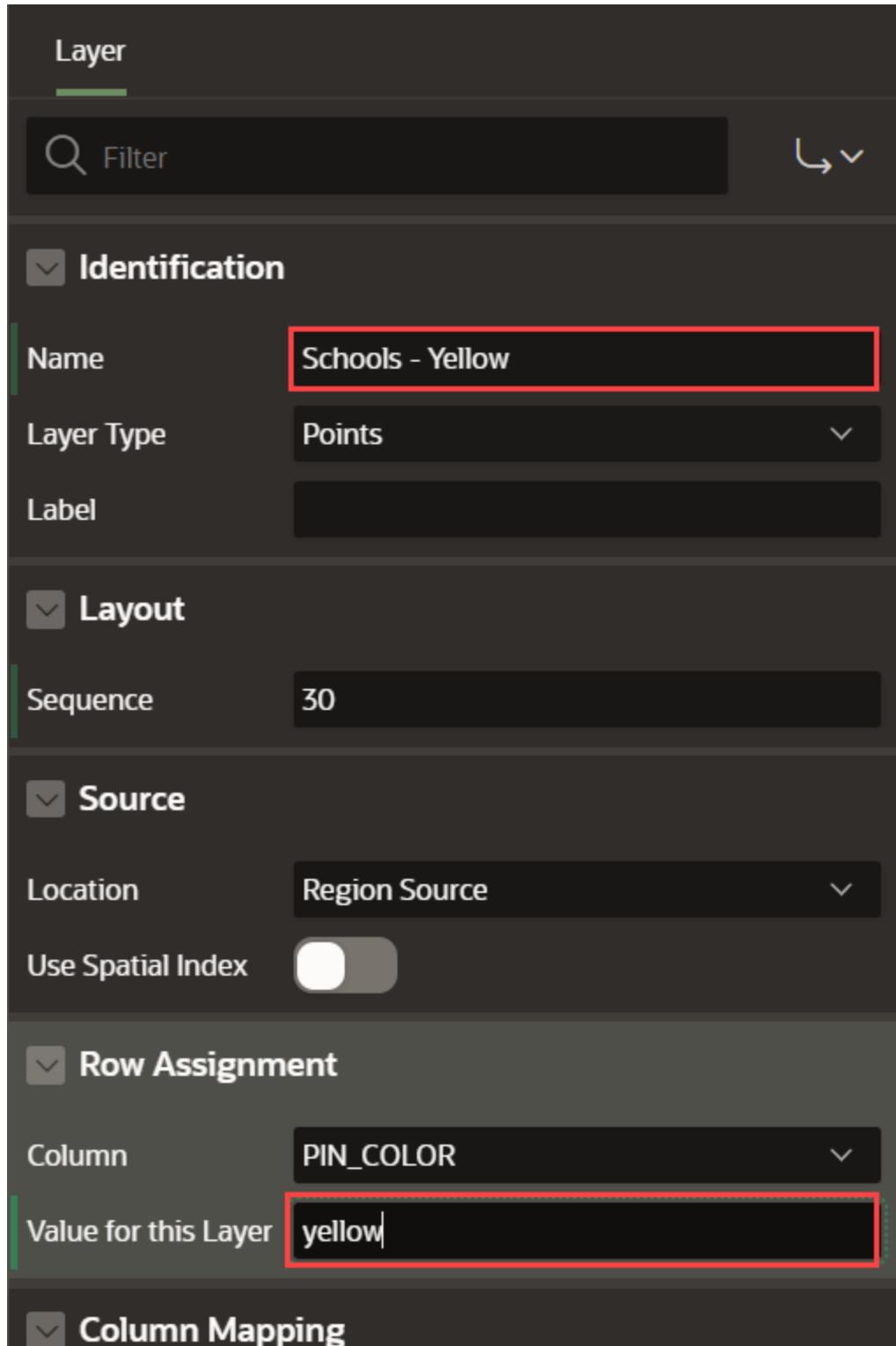
- For **Name**, enter **Schools - Yellow**
- Under **Row Assignment**, for **Value for this Layer**, enter **yellow**

The screenshot shows the Oracle APEX page builder interface. The left sidebar displays the page structure:

- Breadcrumb Bar
- Left Column
 - Search
 - Facets
 - P6_SEARCH
 - P6_METHOD
 - P6_BOROUGH
 - P6_SAFE
 - P6_INTEREST
 - P6_ATTENDANCE_RATE- Body
 - Button Bar
 - Next
 - RESET
 - Nyc Highschools
 - Layers
 - Schools - Red
 - Schools - Green

A context menu is open over the "Schools - Green" layer, showing the following options:

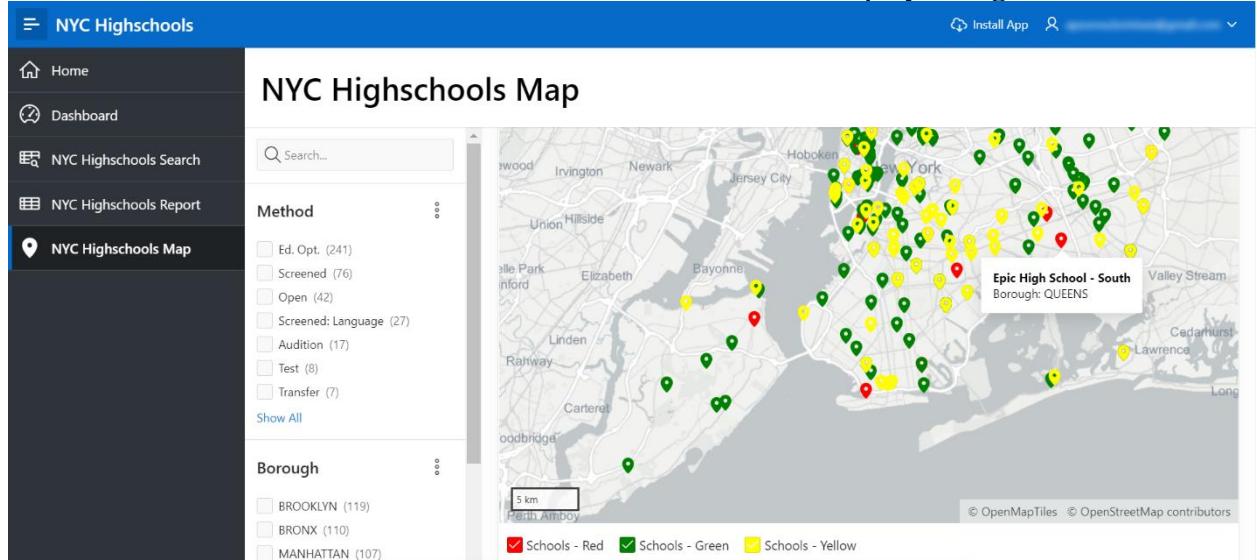
- Duplicate
- Create Layer
- Expand All Below
- Collapse All Below
- Delete Del



33. Click **Save and Run** page. The **NYC Highschools Map** displays different colors for the pins.

- The schools with a Graduation rate between 0-50 are displayed in red

- The schools with a Graduation rate between 50-75 are displayed in **yellow**
- The schools with a Graduation rate between 75-100 are displayed in **green**



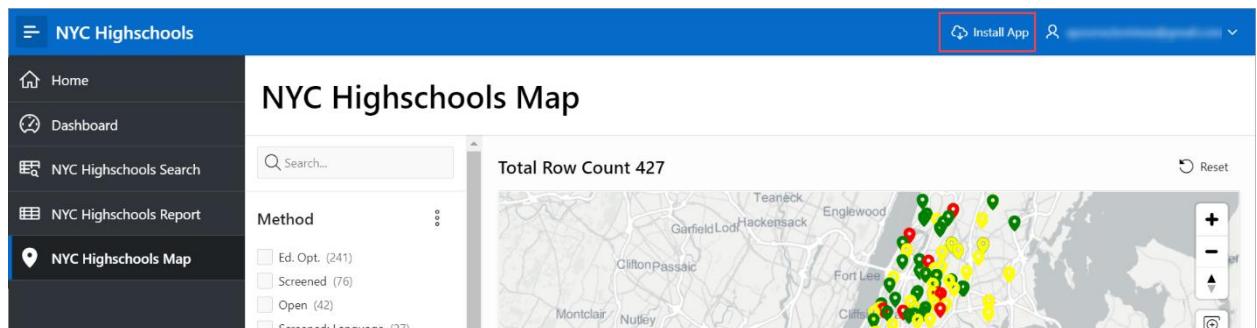
Task 4: Installing a Progressive Web App (PWA)

Progressive Web Applications (PWA) are designed to be fast, responsive, installable to a home screen, reliable (online or offline), and engaging (providing support for push notifications).

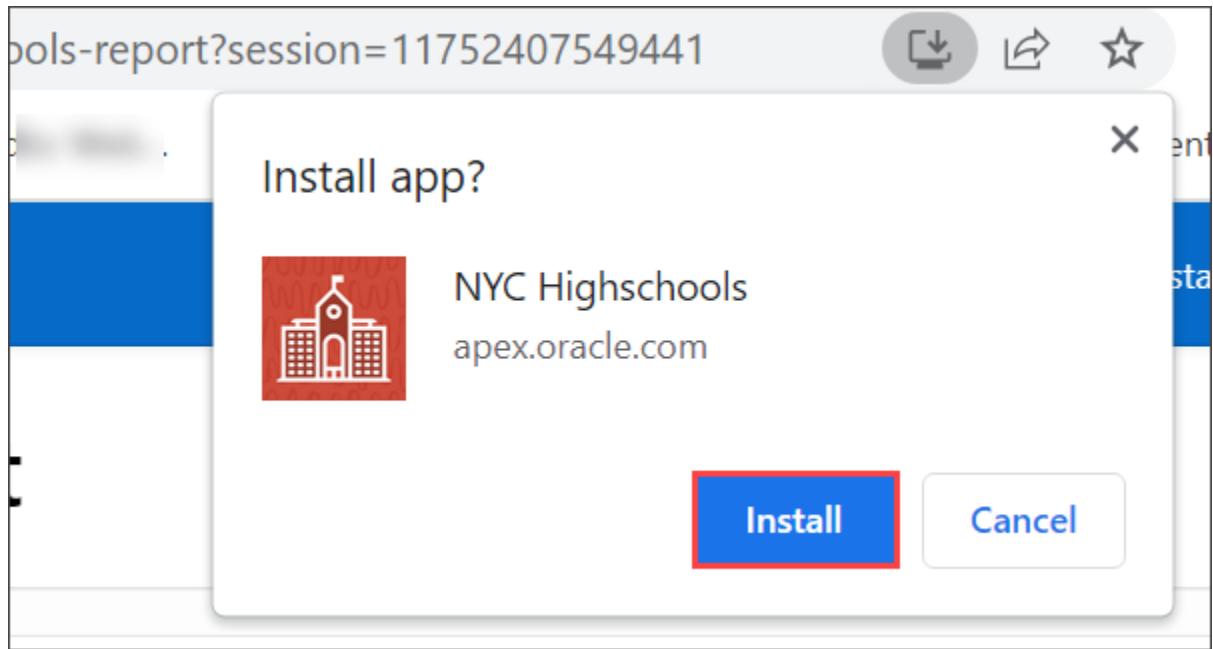
Recall that you created a Progressive Web App by running the Create Application Wizard and enabling the Install Progressive Web App feature in Lab 1 of this workshop. In this step, you will learn to install and use a PWA.

Note:

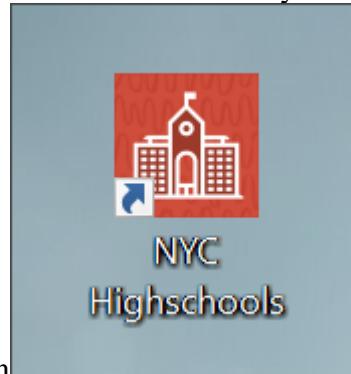
- To enable Progressive Web App, an Oracle APEX application must be served over a secured HTTPS environment, or localhost. If using an unsecured environment, PWA features will not be rendered.
 - PWA is available in Google Chrome, Microsoft Edge and Safari browsers. Firefox does not support PWA.
1. To install a PWA, go to your application and click **Install App** on the navigation bar.



2. A popup dialog appears in your browser asking you whether you want to install the app. Click **Install**.

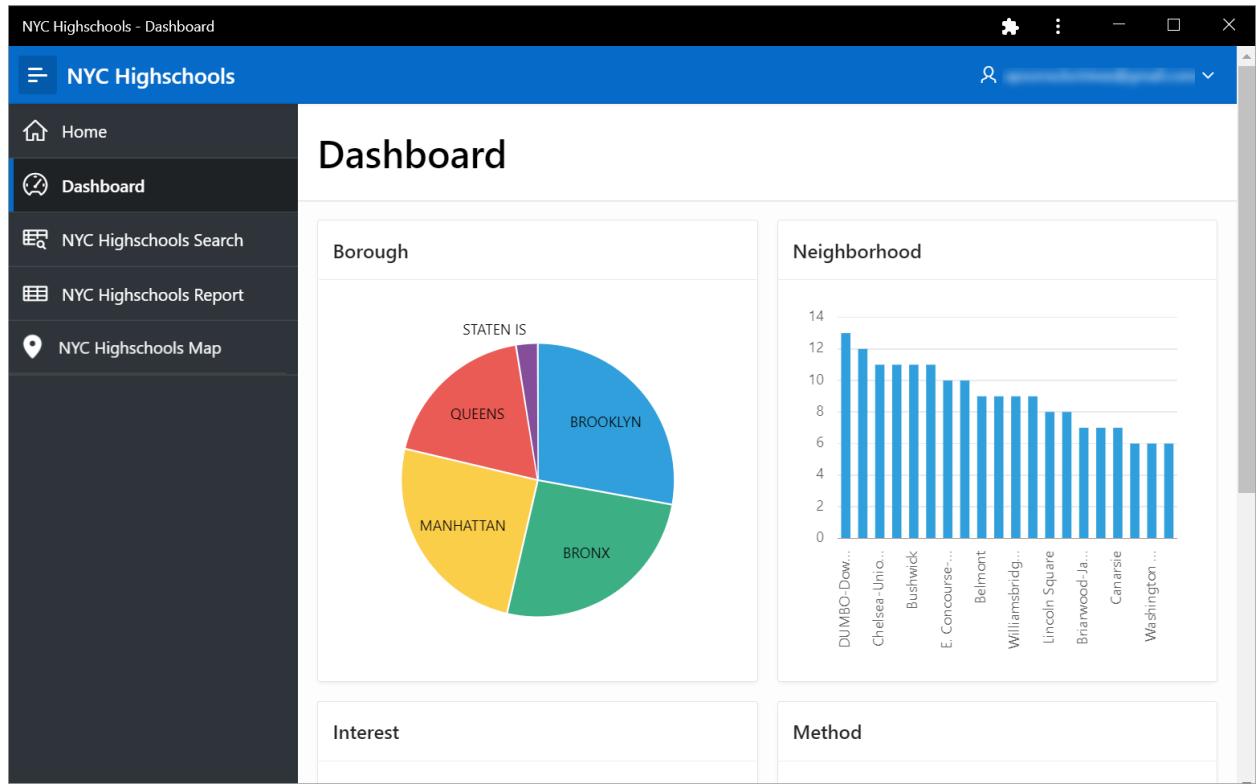


3. After a few seconds, the application icon is created on your desktop/home screen.



Double-click the application icon

4. The application is now open as a PWA without the need for a browser. This provides a customizable offline page when users are offline and cannot request the network. It optimizes page loading speed on the mobile device. It also improves the page load rendering time.



Summary

You now know how to embed a maps in your application and to install a Progressive Web App (PWA).