

openSAP Evolved Web Apps with SAPUI5

Week 2 Unit 5: Discovering Enterprise-Grade Horizons

Exercises

PUBLIC



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DISCOVERING ENTERPRISE-GRADE HORIZONS

Summary

In this unit you will examine your app for major product standards. You will learn how to improve the accessibility capability by adding ARIA attributes and how to enable the text elements on the UI for a new language.

Your main goal is to make your app usable for as many people as you can.

Preview

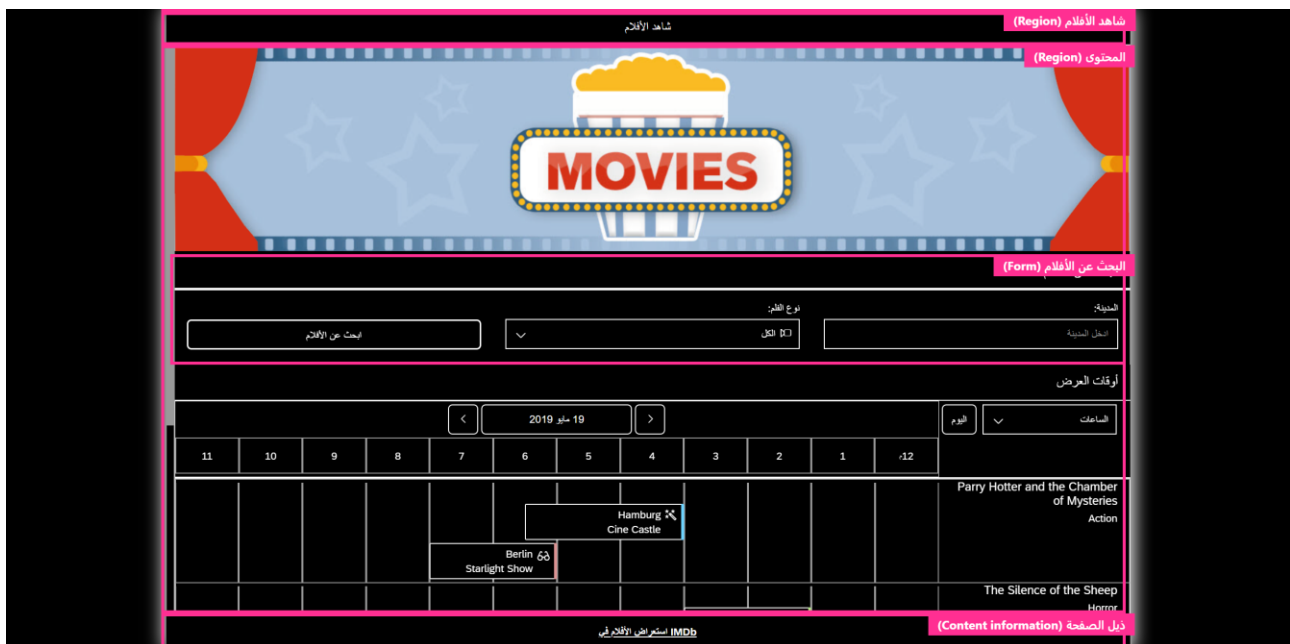


Figure 1 – Enterprise-grade features in movies app

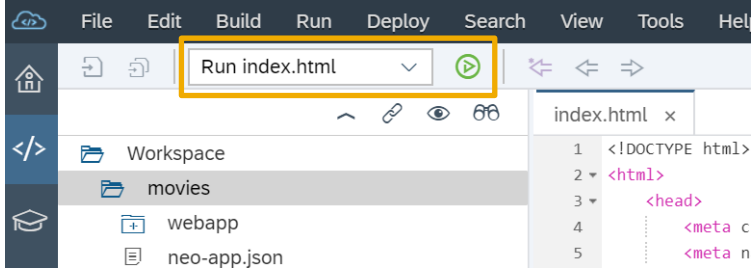
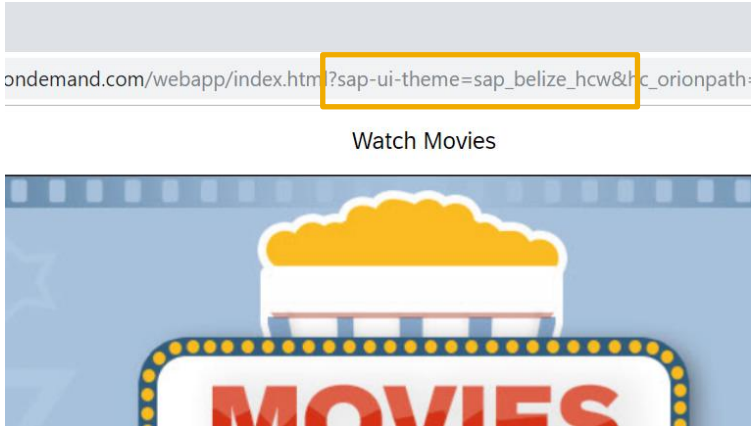
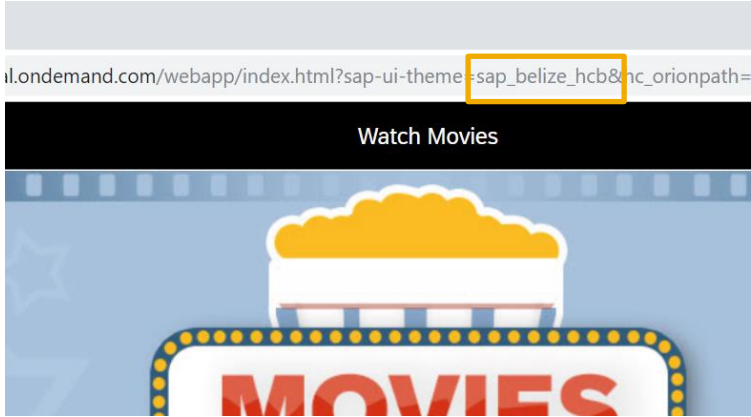
ACCESSIBILITY

Examine high contrast themes delivered by UI5

This section introduces you to the two high contrast themes of UI5 – High Contrast White and High Contrast Black. You will learn how these themes can be switched on by adding a dedicated URL parameter for verifying that your app supports this feature.

Note: Low Vision

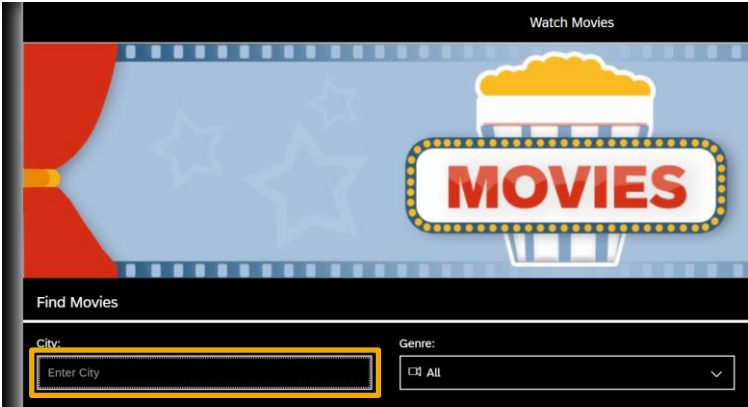
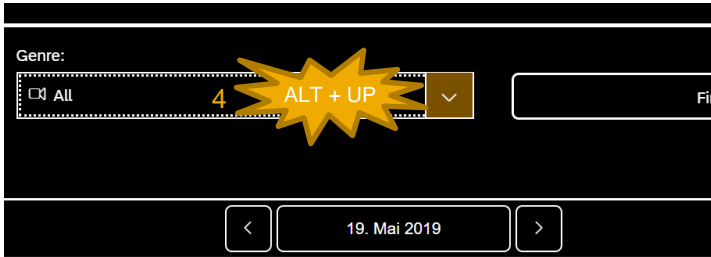
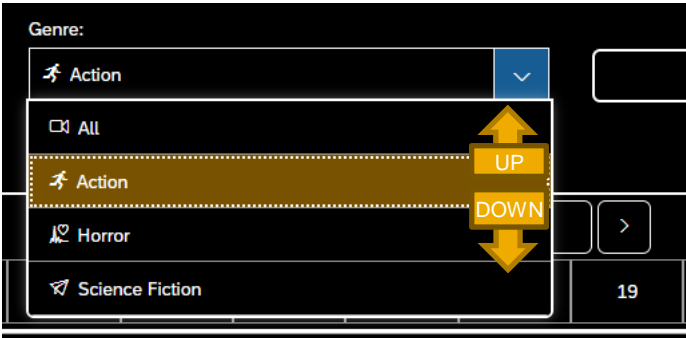
These themes support people with low vision and are required by the accessibility product standard. The term low vision is not only restricted to the loss of acuity of vision, but also includes reduced perception of low contrasts, glare, or color vision.


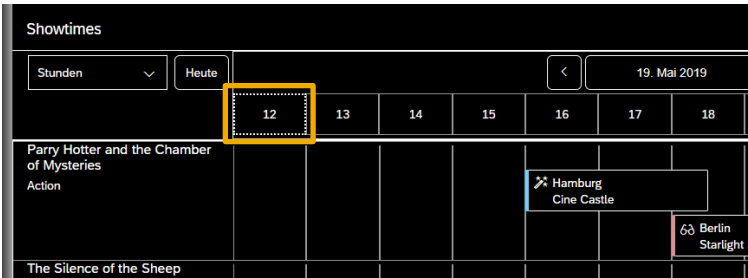
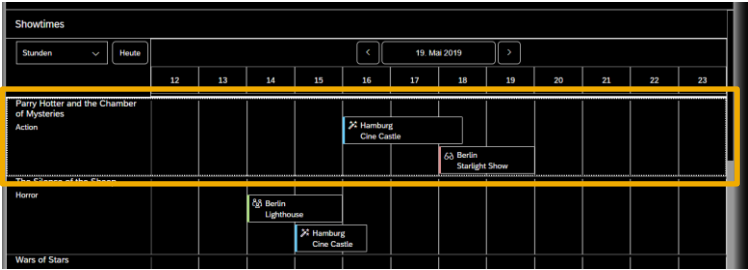
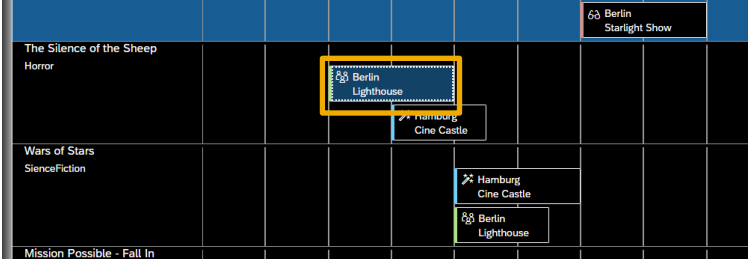
Explanation	Screenshot
1. Run your movies app.	 A screenshot of an IDE interface. The 'Run' button, represented by a green play icon, is highlighted with a yellow rectangle. The dropdown menu next to it shows 'Run index.html'. The file explorer on the left shows a project structure with 'Workspace', 'movies', 'webapp', and 'neo-app.json'.
2. Switch on the High Contrast White theme by appending the sap-ui-theme=sap_belize_hcw URL parameter to the URL as follows: http://<hostname>:<port>/.../index.html?sap-ui-theme=sap_belize_hcw<parameter>=<value>...	 A screenshot of a web browser. The address bar shows a URL with the parameter 'sap-ui-theme=sap_belize_hcw' highlighted by a yellow rectangle. The page content shows a 'Watch Movies' header and a large 'MOVIES' sign graphic.
3. Switch on the High Contrast Black theme by changing the sap-ui-theme URL parameter value to sap_belize_hcb	 A screenshot of a web browser. The address bar shows a URL with the parameter 'sap-ui-theme=sap_belize_hcb' highlighted by a yellow rectangle. The page content shows a 'Watch Movies' header and a large 'MOVIES' sign graphic, rendered in high contrast black.

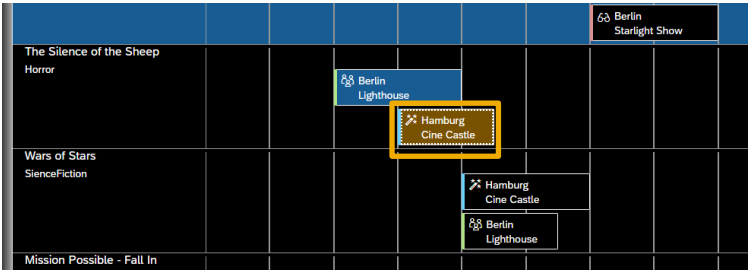
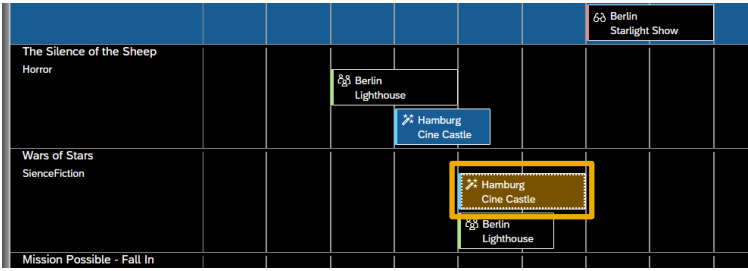

Access UI element with the keyboard

Keyboard handling is one of the most important aspects of web accessibility but also essential for application handling in general. Many power users prefer keyboard navigation over mouse navigation as they tend to be much faster then. UI5 controls already consider this. They are designed to be accessed and executed via keyboard.

This section lets you navigate through your app with the keyboard. You will learn the main keyboard combinations that are used by the UI elements of UI5 plus some additional one for handling the planning calendar.

Explanation	Screenshot
<ol style="list-style-type: none">1. Refresh your movies app in the browser.2. Press the Tab key. <p>Your focus moved to the input filed City.</p> <p>Note: Tab and Shift+Tab You can cycle through all interactive, enabled and visible UI elements that are part of a given dialog or other container. When the last UI element is focused, pressing the key again will move the focus to the first element.</p>	
<ol style="list-style-type: none">3. Move your focus via keyboard handling to the <i>Genre</i> selection list.4. Press the keyboard combination Alt+Up (or Down). <p>The dropdown menu of the <i>Genre</i> selection list opens.</p>	
<ol style="list-style-type: none">5. To scroll down in the list, press Up to scroll up and Down to scroll down in the list. <p>Note: You can also scroll through the list with key UP/DOWN without opening the dropdown menu first.</p>	

Explanation	Screenshot
<p>6. Move your focus via keyboard handling to the <i>Find Movies</i> button.</p> <p>7. Press the Enter key.</p> <p>The search action is triggered immediately after the key is pressed.</p>	
<p>8. Move your focus via keyboard handling to the beginning of the first <i>Calendar View</i> element of the planning calendar.</p> <p>9. Browse through the single hours by using the Right/Left key</p> <p>10. Use the Page Down key to fast forward 12 hours and Page Up for 12 hours backwards</p> <p>11. Combine Page Down with Shift to fast forward 1 day and Page Up and Shift for 1 day backwards</p> <p>12. Combine Ctrl+Shift+Page Down to fast forward by 1 week and Ctrl+Shift+Page Up for 1 week backwards</p>	
<p>13. Move your focus via keyboard handling to the beginning of the first list item of the planning Calendar.</p> <p>14. Browse through the individual list items by using the Up/Down key</p>	
<p>15. Press the Tab key to get to the first visible appointment in the list</p>	

Explanation	Screenshot
16. Press Right to get to the next upcoming appointment in the same list	 <p>The screenshot shows a calendar grid with several appointments. The appointments are: 'The Silence of the Sheep' (Horror), 'Wars of Stars' (ScienceFiction), and 'Mission Possible - Fall In'. The 'Hamburg Cine Castle' appointment is highlighted with a yellow dashed border.</p>
17. Press Down to get to next upcoming appointment in the next list	 <p>The screenshot shows a calendar grid with several appointments. The appointments are: 'The Silence of the Sheep' (Horror), 'Wars of Stars' (ScienceFiction), and 'Mission Possible - Fall In'. The 'Hamburg Cine Castle' appointment is highlighted with a yellow dashed border.</p>
18. Press the Tab key. You've reached the end of the page using the keyboard.	 <p>The screenshot shows a calendar grid with several appointments. The appointments are: 'Mission Possible - Fall In' (Action), 'Berlin Lighthouse', 'Munich Movie House', 'Hamburg Cine Castle', and 'Berlin Starlight Show'. The 'Explore the IMDb Movie Database' link is highlighted with a yellow dashed border.</p>

Improve accessibility by adding landmark regions

To improve the accessibility of your app, you will add ARIA (Accessible Rich Internet Applications Suite) attributes. They consist of markup that can be added to HTML in order to clearly communicate the roles, states, and properties of user interface elements. This information helps screen readers and other assistive technologies to better understand the elements on a web page. This, in turn, enables blind or visually impaired people to effectively interact with those elements on the UI.

Landmarks are one of the ARIA attributes that provide significant immediate benefits to screen reader users in that they identify the structure of a web page. By doing this, they enable a quick overview of a page, and make navigation much more effective.

There are eight of these roles, each representing a block of content that occurs commonly on web pages: Banner, Complementary, Content Info, Form, Main, Navigation, Region, and Search.

In this section you will learn how you can apply landmarks to the container elements of a `sap.m.Page` control to provide a meaningful page overview.

Note:

For this exercise you need Google Chrome with the free [landmark navigation extension](#) (or any corresponding software).

webapp/i18n/i18n.properties

```
...
messageToast=Do you feel like going to the movies?

#~~~ Landmark descriptions ~~~~~
landmarkContent=Content
landmarkFooter=Footer
landmarkMainPage=Movies Page
landmarkDetailPage=Movies Detail Page

#~~~ Detail View ~~~~~
```

Each landmark should have a unique label which you have to add to the resource bundle, so they can also be translated into different languages.

First, you need to identify the logical structure of the different pages of your app. Your app consists of two pages: the App view and the Detail view.

The App view uses the header, the content, the footer and the root container of the `sap.m.Page` control. As the header begins with the heading element `title`, it can be used as the label for the area. No additional descriptive text is needed. This is not the case for the other three containers. Here you need to provide a new text for each of them that can be assigned to the label of the corresponding landmark role. The root container contains the whole content of the page. Therefore, you should assign a description that explains the purpose of the page.

The Detail view uses only the content, the footer and the root container of the `sap.m.Page` control. Except for the root container you can use the same labels as on the App view.

Note:

Avoid using the landmark role as part of the label. For example, a navigation landmark with a label "Site Navigation" will be announced by a screen reader as "Site Navigation Navigation". The label should simply be "Site".

webapp/view/Home.view.xml


```

...
<Page title="{i18n>title}">
  <landmarkInfo>
    <PageAccessibleLandmarkInfo
      rootRole="Main"
      rootLabel="{i18n>landmarkMainPage}"
      contentRole="Region"
      contentLabel="{i18n>landmarkContent}"
      footerRole="ContentInfo"
      footerLabel="{i18n>landmarkFooter}"
      headerRole="Region"
      headerLabel="{i18n>title}"/>
    </landmarkInfo>
  <content>
    <Image
      visible="{= !${device>/system/phone} }"
      src="images/MoviesHeader.png"
      width="100%"
      tooltip="{i18n>imageTooltip}"
      press="sap.m.MessageToast.show({i18n>messageToast})"/>
  </content>
...

```

The `sap.m.Page` control contains the aggregation `landmarkInfo` of type `sap.m.PageAccessibleLandmarkInfo`. Use this setting to define the ARIA roles and labels for the page areas of the App view.

webapp/view/Detail.view.xml

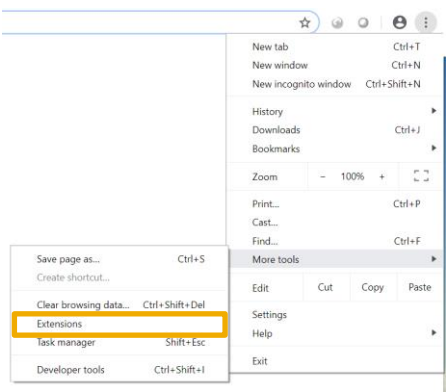
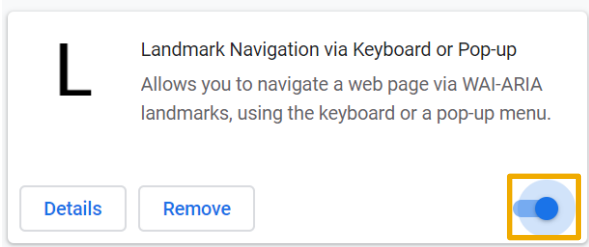
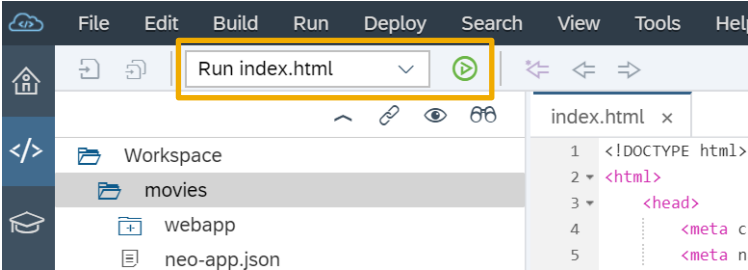
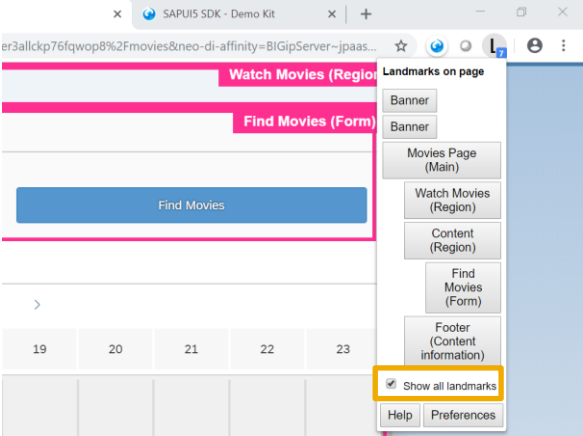
```

...
<Page
  title="{movies>cinemaName} - {
    path: 'movies>startDate',
    type: 'sap.ui.model.type.Date',
    formatOptions: {
      source: {
        pattern: 'MM/dd/yyyy/hh:mm:ss'
      },
      relative: true,
      relativeScale: 'auto'
    }
  }"
  showNavButton="true"
  class="sapUiResponsiveContentPadding"
  navButtonPress=".onNavBack">
  <landmarkInfo>
    <PageAccessibleLandmarkInfo
      rootRole="Main"
      rootLabel="{i18n>landmarkDetailPage}"
      contentRole="Region"
      contentLabel="{i18n>landmarkContent}"
      headerRole="Region"
      headerLabel="{movies>cinemaName}"
    </>
  </landmarkInfo>
  <content>
    <FlexBox wrap="Wrap">
  </content>
...

```

Use the `landmarkInfo` setting of the `sap.m.Page` control to define the ARIA roles and labels for the page areas of the Detail view.

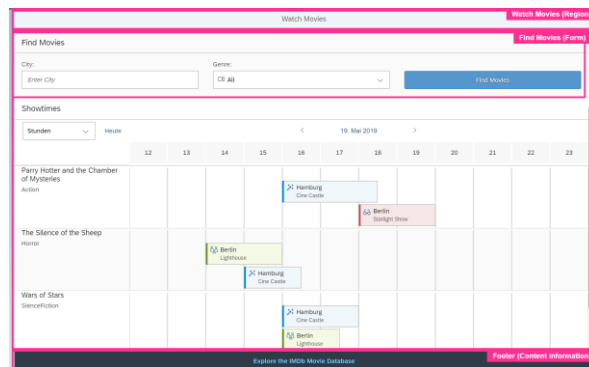
Testing the landmarks of your movies app

Explanation	Screenshot
1. Go to <i>Extensions</i> in your Chrome browser.	 A screenshot of the Chrome browser's main menu. The 'Extensions' option is highlighted with an orange rectangle. Other visible options include 'New tab', 'New window', 'History', 'Downloads', 'Bookmarks', 'Zoom', 'Print...', 'Cast...', 'Find...', 'More tools', 'Edit', 'Cut', 'Copy', 'Paste', 'Settings', 'Help', and 'Exit'.
2. Activate the <i>Landmark Navigation</i> extension	 A screenshot of the Landmark Navigation extension's interface. It features a large 'L' icon, the title 'Landmark Navigation via Keyboard or Pop-up', a description 'Allows you to navigate a web page via WAI-ARIA landmarks, using the keyboard or a pop-up menu.', and two buttons: 'Details' and 'Remove'. A blue toggle switch is visible in the bottom right corner, highlighted with an orange rectangle.
3. Run your movies app.	 A screenshot of the SAPUI5 IDE interface. The 'Run' button, represented by a green play icon, is highlighted with an orange rectangle. The interface also shows a file explorer on the left with a 'movies' folder and a code editor on the right displaying HTML code.
4. In the <i>Landmarks</i> window check <i>Show all landmarks</i> .	 A screenshot of the 'Landmarks on page' window in the Landmark Navigation extension. The window lists various landmarks on the page, such as 'Banner', 'Movies Page (Main)', 'Watch Movies (Region)', 'Content (Region)', 'Find Movies (Form)', and 'Footer (Content Information)'. The 'Show all landmarks' checkbox at the bottom is checked and highlighted with an orange rectangle.

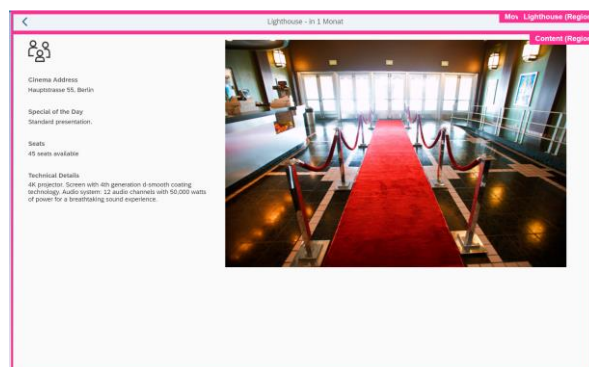
Explanation

- Explore the landmark roles on your App page.

Screenshot



- Navigate to the Details page and ensure that all landmark roles you configured are provided there as well.



GLOBALIZATION

Create locale-specific resource bundle files for internationalization (i18n)

In this section you will create an additional resource bundle file for Chinese and Arabic for the i18n resource model and learn how you can test language-dependent capabilities.

webapp/i18n/i18n_zh_CN.properties (New)

```
#~~~ Home View ~~~~~

title=看电影
appTitle=看电影
appDescription=查找喜欢电影的上映时间
imageTooltip=电影插图
labelCity=城市
cityPlaceholder=输入城市名称
labelGenre=类型
genreAll=所有类型
genreAction=动作片
genreHorror=恐怖片
genreScienceFiction=科幻片
buttonMovieSearch=搜索影片
calendarTitle=上映时间
search=正在搜索
titleForm=查找影片
footerLink=去往IMDb电影数据库
messageToast=这是你想看的电影么？

#~~Landmark descriptions
landmarkContent=内容
landmarkFooter=页脚
landmarkMainPage=影讯首页
landmarkDetailPage=电影详细信息页面

#~~~ Detail View ~~~~~

cinemaName=影院名
cinemaAddress=影院地址
special=今日特供
technicalDetails=影院硬件配置
seats=座位

#~~~ Not Found View ~~~~~

notFoundTitle=出错了！
notFoundText=你找的电影还没有开拍呢
notFoundDescription=马上回来...
```

All internationalization resource bundle files are named with the same base name (i18n), an optional suffix that identifies the language contained in each file, and the `.properties` extension. The language suffixes are formed according to the JDK locale syntax.

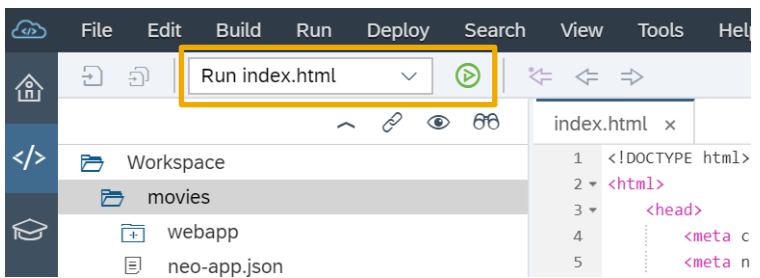


Therefore, to deposit a bundle file for Chinese, you have to add the language code for simplified Chinese (zh) with a preset underscore (_) after the base name.

Chinese can be considered as a language or a language family with some main regional language groups of spoken Chinese; all of them with their own dialects or varieties. Therefore, you should specify which Chinese of which region you refer to.

Note:

The JDK locale syntax combines a lower-case [ISO 639 alpha-2 or alpha-3 language code](#) with an upper-case [ISO 3166 alpha-2 country code](#). Both codes are connected with an underscore.

Switch your app to Chinese language

Explanation	Screenshot
7. Run your movies app.	
8. Change the output language of your app to Chinese by appending the URL parameter <code>sap-ui-language</code> with the configuration value <code>zh_CN</code> to the URL as follows: <code>http://<hostname>:<port>/.../index.html?sap-ui-language=zh_CN&<parameter>=<value>...</code>	
9. Check if all your text-related UI elements are translated.	

Explanation	Screenshot
10. Confirm that text-related elements of the controls are also translated.	
11. Explore the calendar representation in Chinese.	
12. Navigate to the Details page and check the internationalization support there.	

webapp/i18n/i18n_ar.properties (New)

#~~~ Home View ~~~~~

```

title=شاهد الأفلام
appTitle=شاهد الأفلام
appDescription=ابحث عن مواعيد عرض الأفلام المفضلة لديك
imageTooltip=Movie illustration
labelCity=المدينة
cityPlaceholder=ادخل المدينة
labelGenre=نوع الفيلم
genreAll=الكل
genreAction=المغامرة
genreHorror=الرعب
genreScienceFiction=الخيال العلمي
buttonMovieSearch=ابحث عن الأفلام
calendarTitle=أوقات العرض
search=...جاري البحث
titleForm=البحث عن الأفلام
footerLink=استعراض الأفلام في IMDb

```

```

messageToast=?الذهاب إلى السينما?

#~~Landmark descriptions
landmarkContent=?المحتوى?
landmarkFooter=?ذيل الصفحة?
landmarkMainPage=?صفحة الأفلام?
landmarkDetailPage=?صفحة تفاصيل الأفلام?

#~~~ Detail View ~~~~~

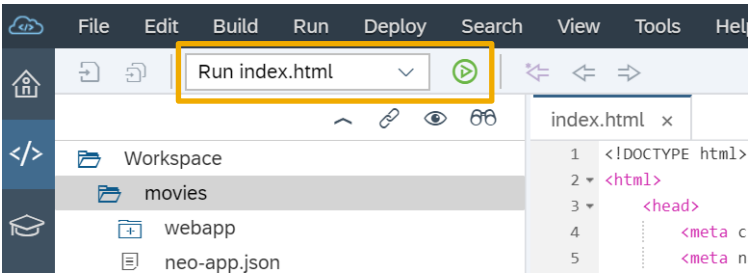
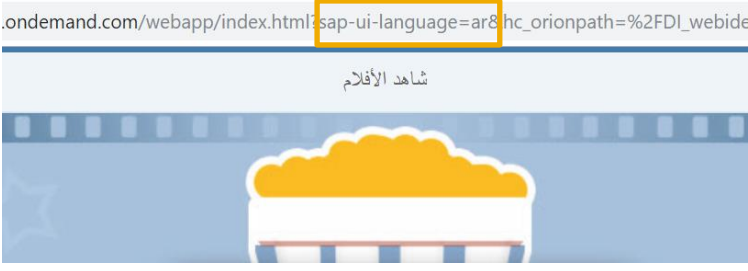
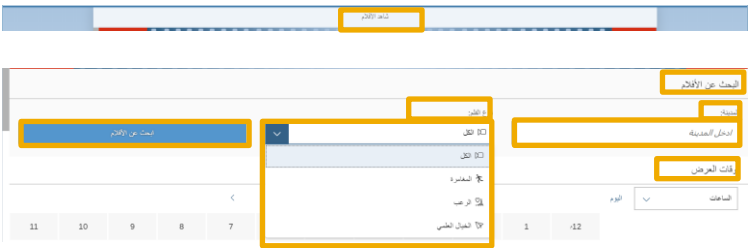
cinemaName=?اسم السينما?
cinemaAddress=?عنوان السينما?
special=?المميز لهذا اليوم?
technicalDetails=?تفاصيل تقنية?
seats=?المقاعد?


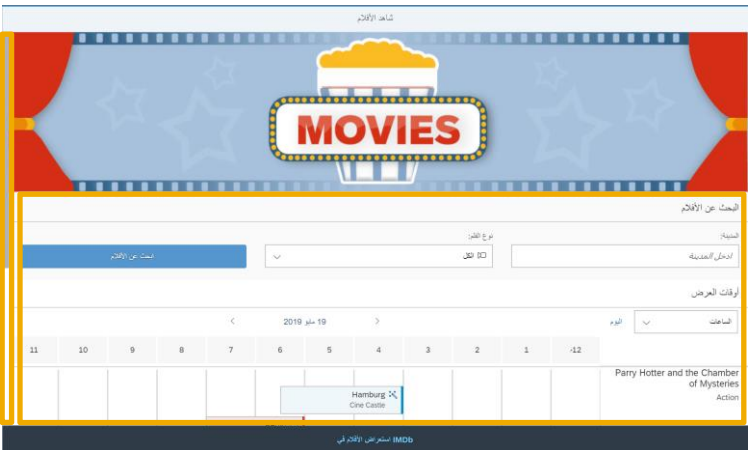
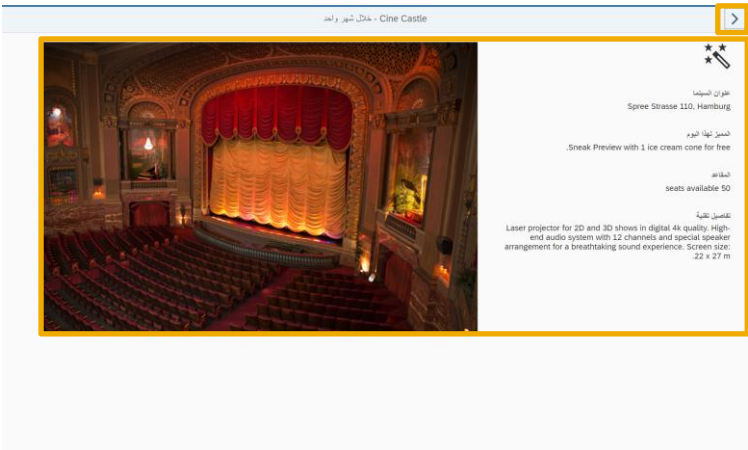
#~~~ Not Found View ~~~~~

notFoundTitle=?خطأ?
notFoundText=?لم يتم إنتاج هذا الفلم بعد?
notFoundDescription=?قم بزيارتنا قريباً...?

```

Switch your app to Arabic language

Explanation	Screenshot
1. Run your movies app.	
2. Change the output language of your app to Arabic by appending the URL parameter sap-ui-language with the configuration value ar to it as follows: http://<hostname>:<port>/.. ../ index.html?sap-ui-language=ar<parameter>=<value>...	
3. Check if all your text-related UI elements are translated.	

Explanation	Screenshot
	
<p>4. Confirm that all text-displaying controls and the alignment of the whole page is in right-to-left mode.</p>	
<p>5. Navigate to the Details page and explore that the animation going from right to left as well.</p> <p>6. Confirm that this page supports the right-to-left mode as well.</p>	

RELATED MATERIAL

Theming

- [SAP Fiori Design Guidelines](#)
- [Info: 72 Font Family](#)
- [Tool: Theme Parameter Toolbox](#)
- [Tool: Icon Explorer](#)

Accessibility

- [Demo Kit: Accessibility Documentation](#)
- [Info: W3C Practices for WAI-ARIA landmark roles](#)
- [Blog: Accessible Rich Internet Applications \(ARIA\) – Introduction](#)

Globalization

- [Demo Kit: Localization Documentation](#)
- [Demo Kit: Right-to-Left support](#)
- [Info: ISO 639 alpha-2 or alpha-3 language code](#)
- [Info: ISO 3166 alpha-2 country code](#)
- [API: Calendar types supported by UI5](#)
- [Demo Kit: Formatter classes in UI5](#)
- [Blog: New Possibilities to Format Numbers in UI5](#)

Security

- [Demo Kit: Securing Apps](#)
- [Demo Kit: Secure programming aspects](#)
- [Demo Kit: Frame Options to prevent clickjacking](#)
- [W3C recommendation for Content Security Policy](#)

Coding Samples

Any software coding or code lines/strings ("Code") provided in this documentation are only examples and are not intended for use in a production system environment. The Code is only intended to better explain and visualize the syntax and phrasing rules for certain SAP coding. SAP does not warrant the correctness or completeness of the Code provided herein and SAP shall not be liable for errors or damages caused by use of the Code, except where such damages were caused by SAP with intent or with gross negligence.

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