

Internationaliz(s)ing

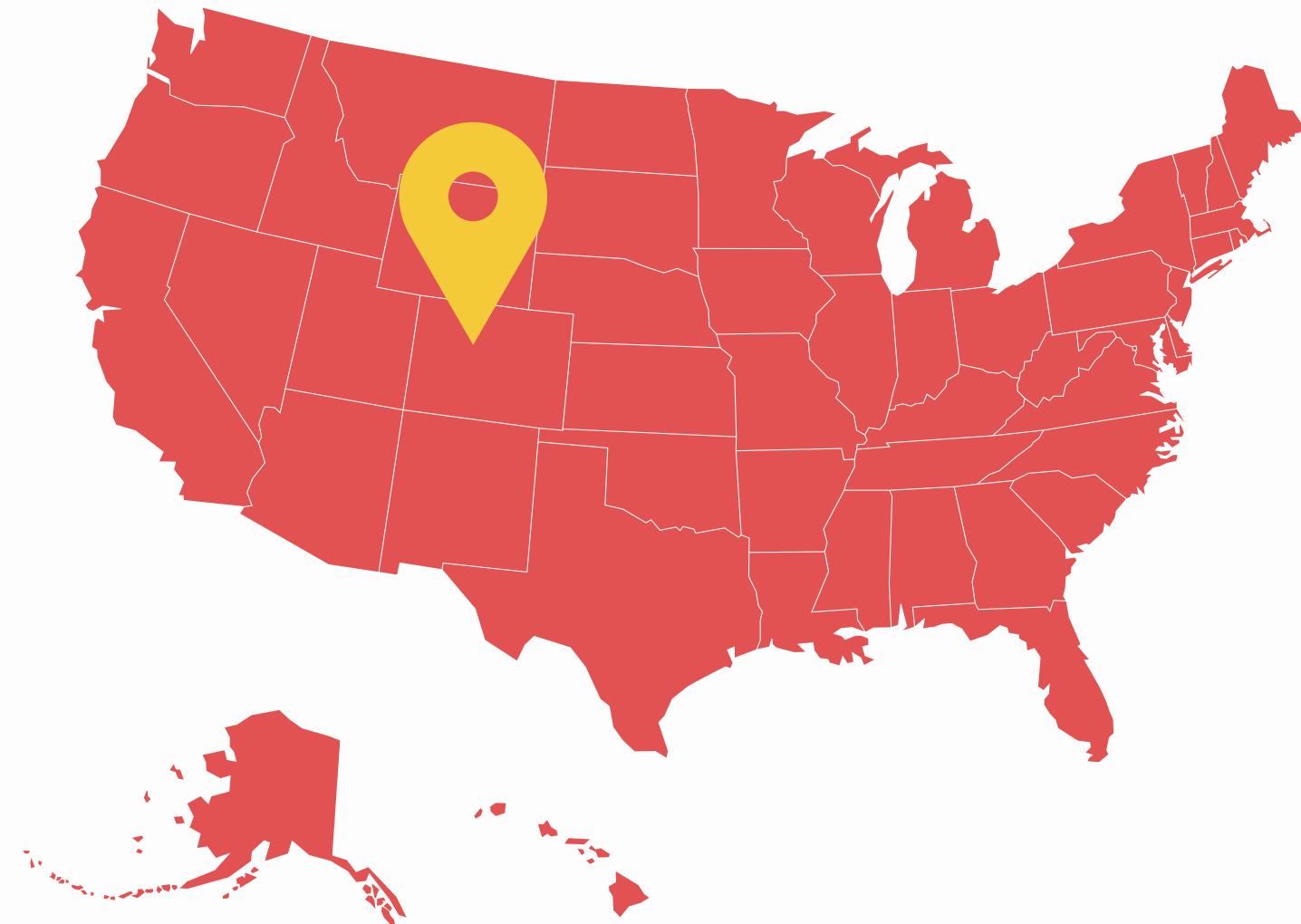
React

Daria Caraway



2021

About Me



Daria Caraway

Senior UI Engineer @ Netflix
Colorado, USA

2021

My Language Journey

@daria
caraway

2021

My Language Journey



English
native language

2021

My Language Journey



English
native language



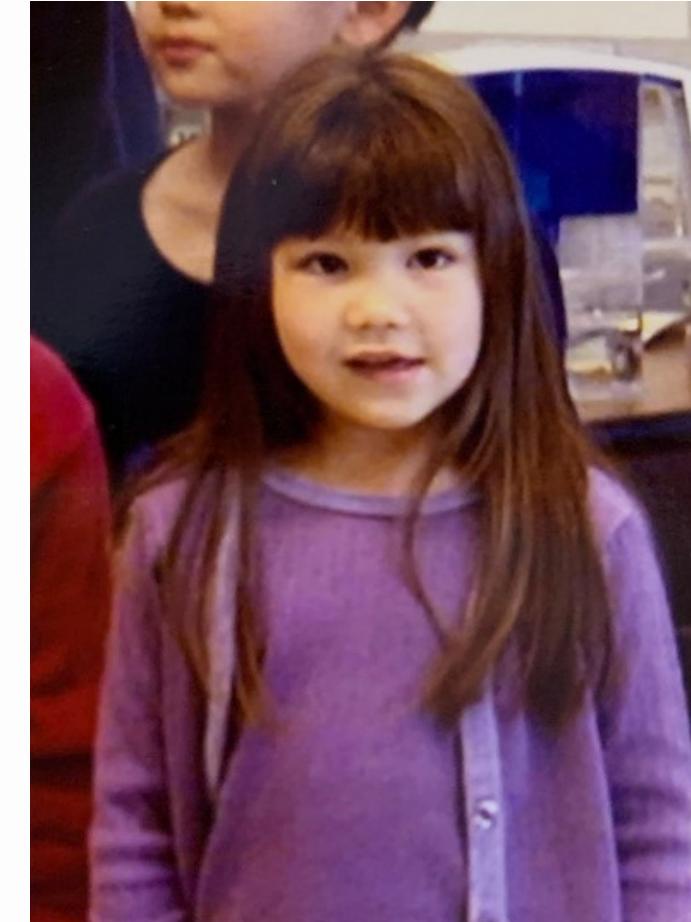
Chinese
4 years old

2021

My Language Journey



English
native language



Chinese
4 years old



Spanish
Grade 6

Learning a language is hard

2021

Me now...



@daria
caraway

Maintaining a
language is also
hard

**How can we design our
React applications so
languages and locales
are easy to add and
Maintain?**

internationalization **i18n**

Architecting your app so when localization occurs – things work as expected.

localization **l10n**

Actually making the content and experience for a given locale.

Elements of Localization

Language

Translations,
Direction,
Time & Date,
Sorting, Plural

Currency

Formatting,
Processing,
Conversions

Symbols & Graphics

Icons,
Colors,
Images,
Cultural Interpretations

Legal Requirements

Privacy Laws,
Data Handling Laws,
Hosting Laws

React i18n Libraries

react-intl

formatjs / [formatjs](#)



react-i18next

i18next / [react-i18next](#)

2021

Let's build it...

2021



Virtual Moments

Watch a live sunset from
somewhere around the
world.

Sunset Central

▲ Mountain

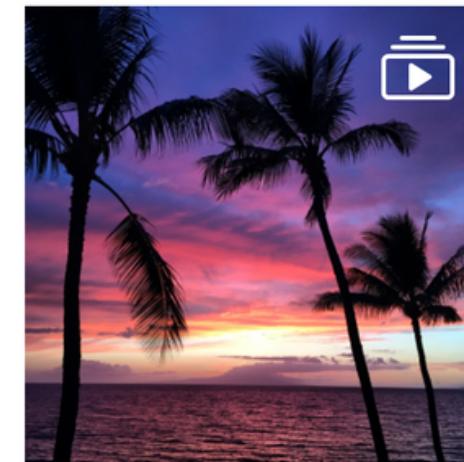
* Snow

❖ Beach

🏜 Desert

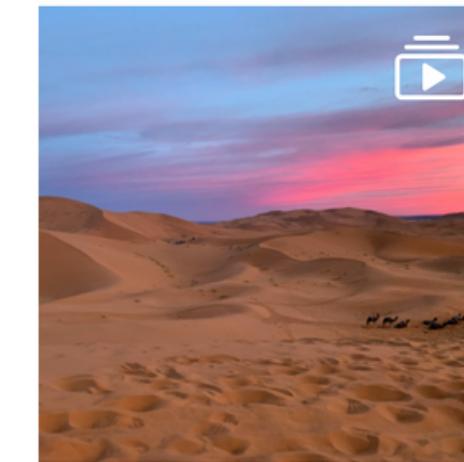
🏞 River

🏙 City



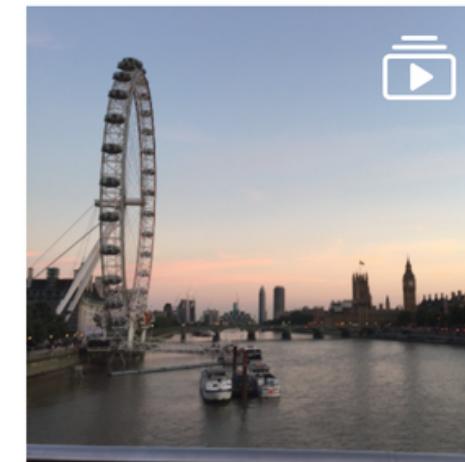
Maui, Hawaii, USA

Begins: 4/15/2021, 9:33 PM



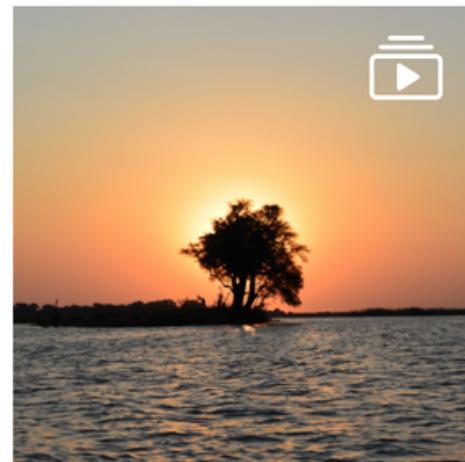
Merzouga, Morocco

Begins: 4/16/2021, 11:22 AM



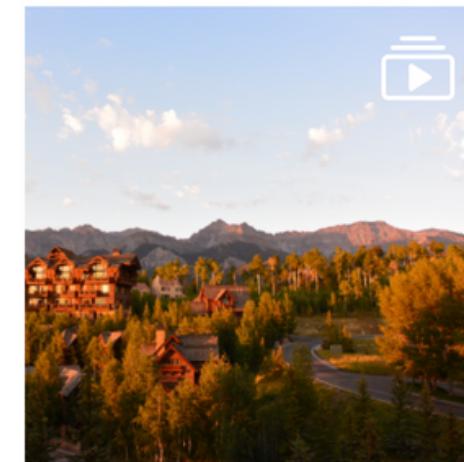
London, United Kingdom

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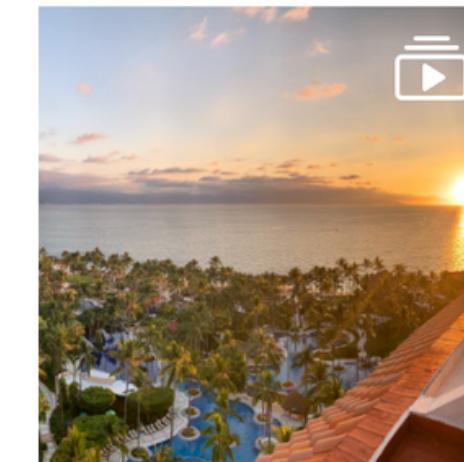
Okavango Delta, Botswana

Begins: 4/16/2021, 9:36 AM



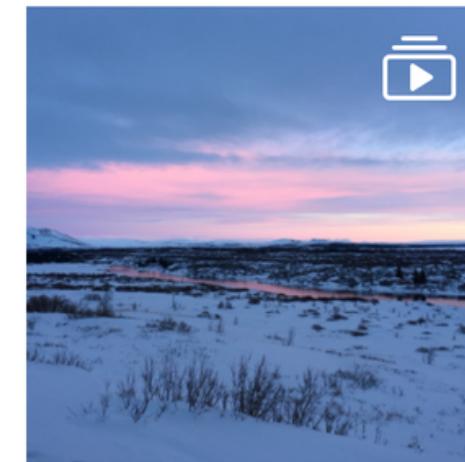
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Puerto Vallarta, Mexico

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Reykjavik, Iceland

Begins: 4/16/2021, 12:17 PM



Marakesh, Morocco

Begins: 4/16/2021, 11:37 AM

Sunset Central & i18n

**Gaining popularity in
other markets**

First Target Regions



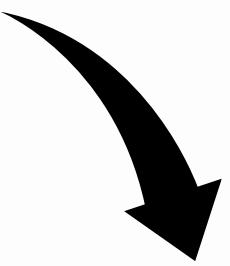
1. Spanish speakers in
Spain



2. Arabic speakers in
Egypt

Sunset Central & i18n

**Gaining popularity in
other markets**



**Built a team of
translators and locale
experts**

Parts of a Locale

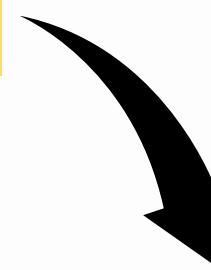
language - script - country - variant - extension

language
(Spanish)
es - **ES**
country
(Spain)

language
(Arabic)
ar - **EG**
country
(Egypt)

Sunset Central & i18n

**Gaining popularity in
other markets**



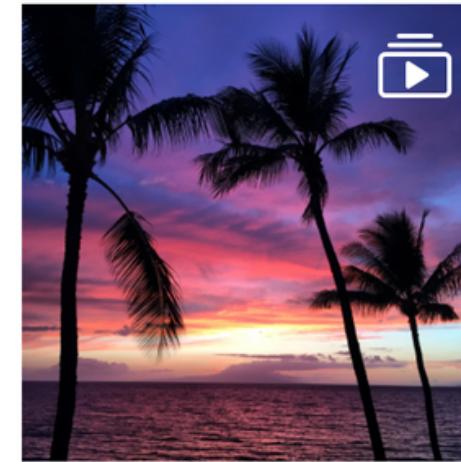
**Built a team of
translators and locale
experts**



Devs start i18n work!

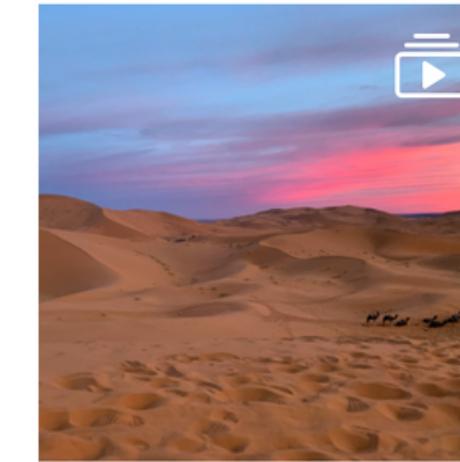
Sunset Central

-  Mountain
-  Snow
-  Beach
-  Desert
-  River
-  City



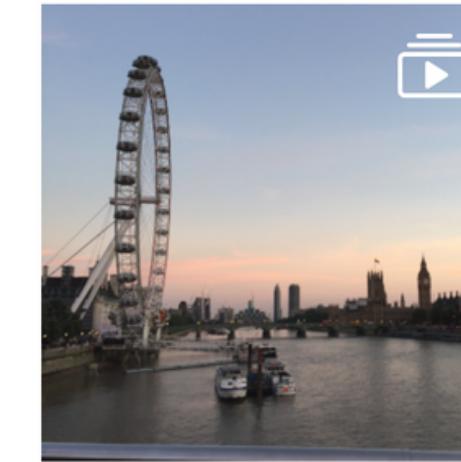
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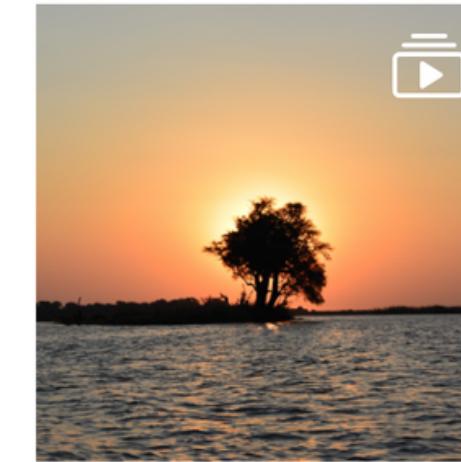
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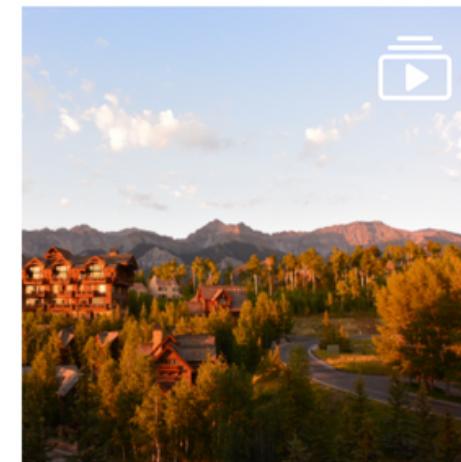
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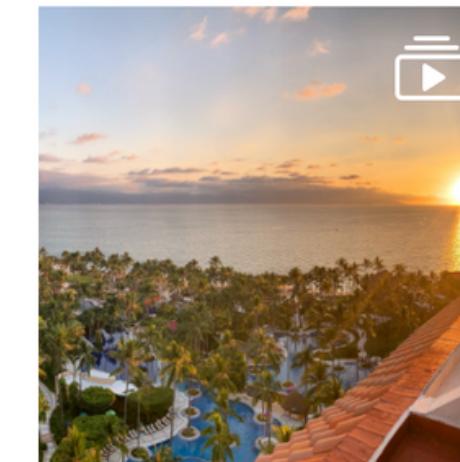
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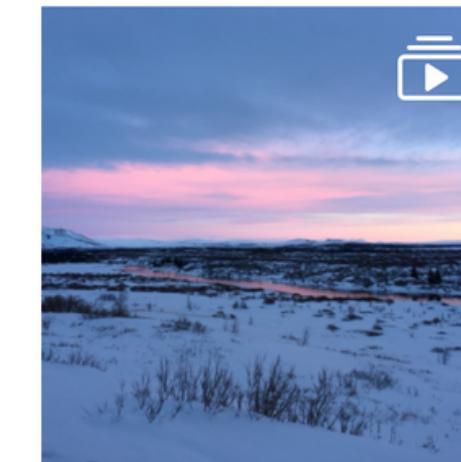
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Sunset Central

▲ Mountain

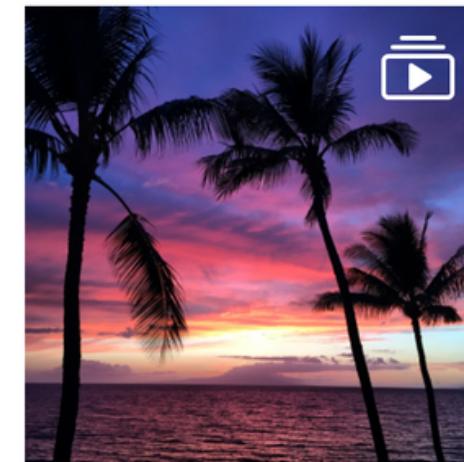
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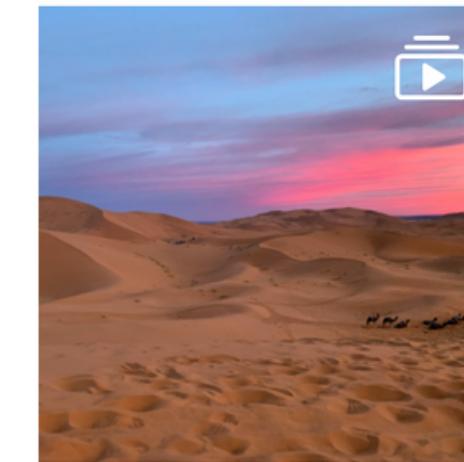
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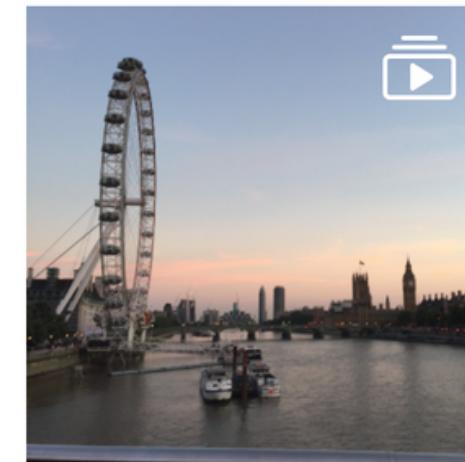
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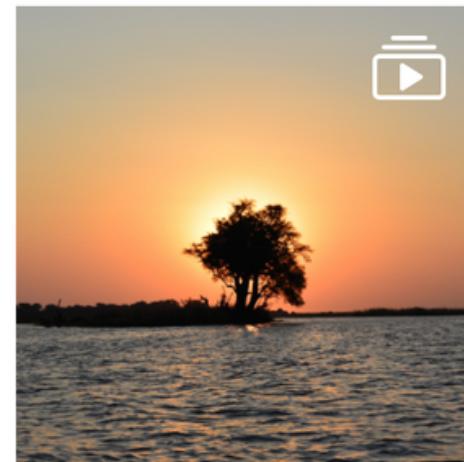
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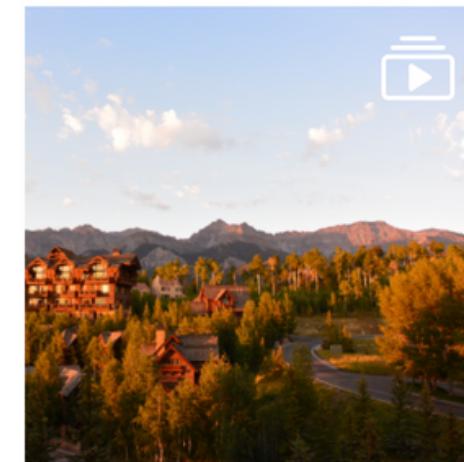
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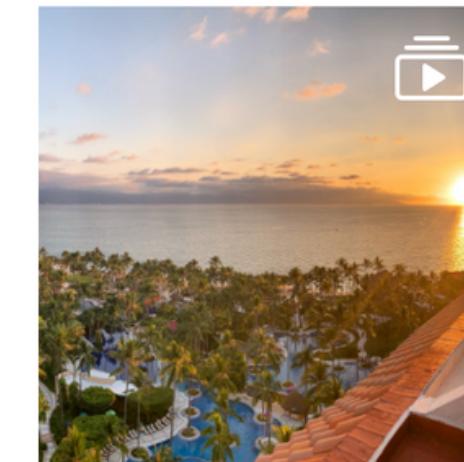
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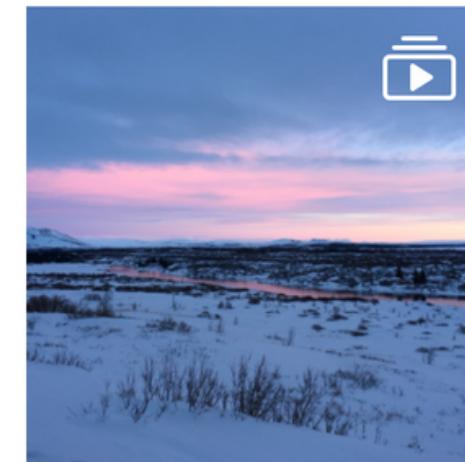
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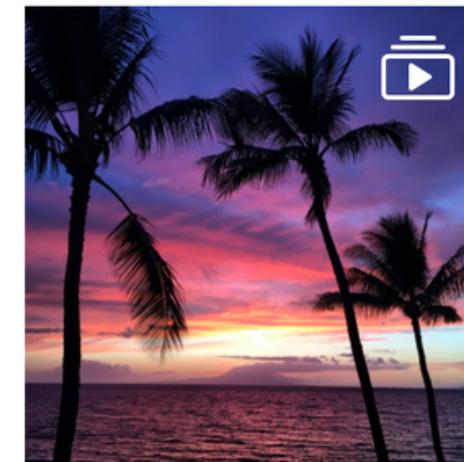
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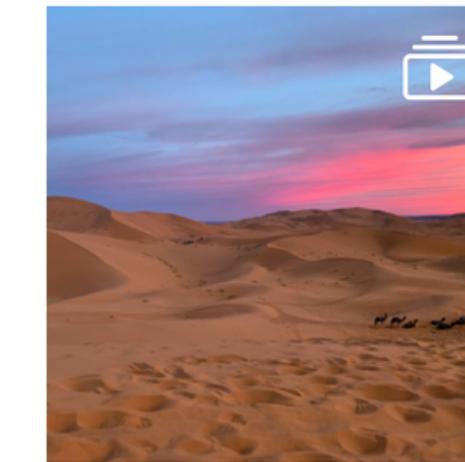
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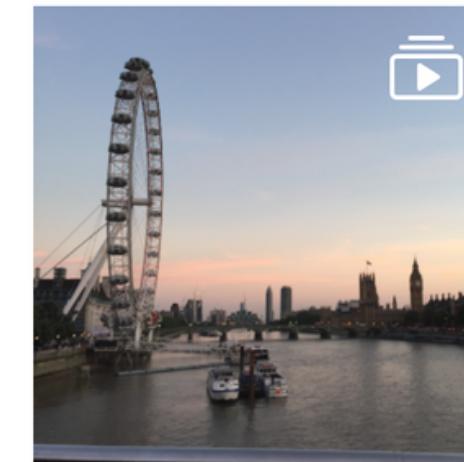
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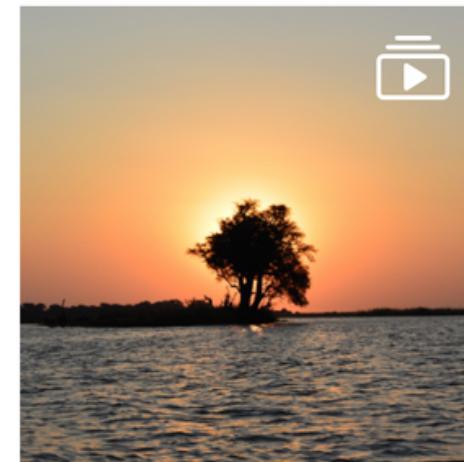
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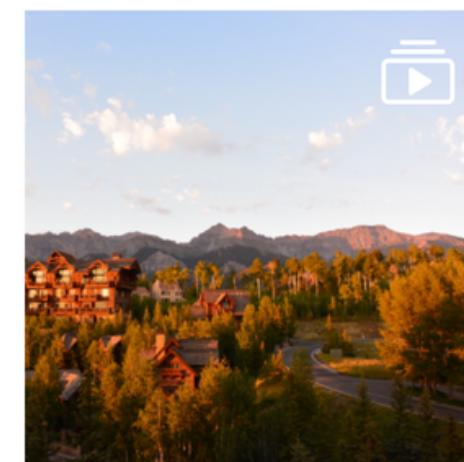
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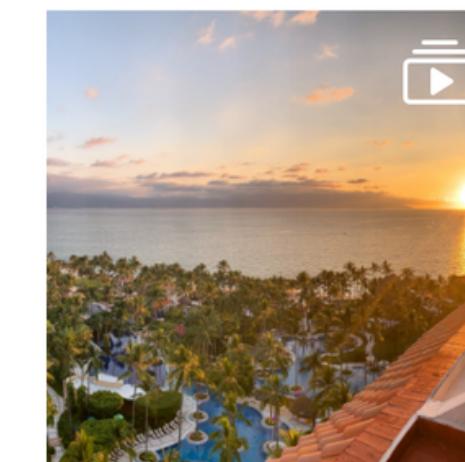
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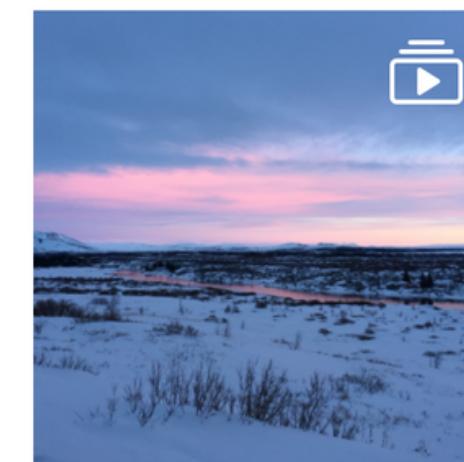
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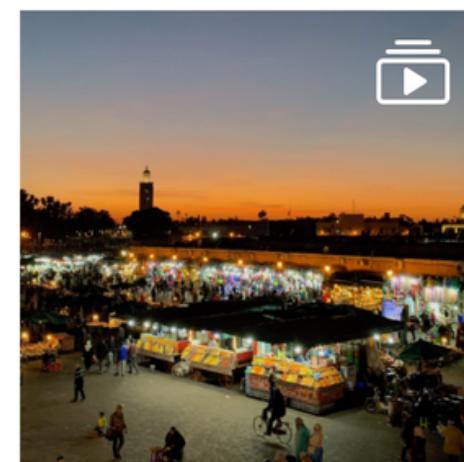
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Marakesh, Morocco

Begins: 4/16/2021, 11:37 AM

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Architecting a React App for...

Text Translations

Date Formatting

Language Directions

Text Translations



```
export const translations = {
  'en-US': {
    'SUNSET_CENTRAL.MOUNTAIN': 'Mountain',
    'SUNSET_CENTRAL.SNOW': 'Snow',
    'SUNSET_CENTRAL.BEACH': 'Beach',
    'SUNSET_CENTRAL.DESERT': 'Desert',
    'SUNSET_CENTRAL.RIVER': 'River',
    'SUNSET_CENTRAL.CITY': 'City',
    'SUNSET_CENTRAL.BEGINS': 'Begins:',
  },
  'es-ES': {...},
  'ar-EG': {...},
}
```

{string key: string value}

How are they stored in React?



```
const TranslationContext = createContext<TranslationContextProps>(translationContextDefault)

export function TranslationProvider({
  defaultLocale,
  translations,
  children,
}: TranslationProviderProps) {
  const [locale, setLocale] = useState(defaultLocale)

  const translate = (key: TranslationKey) => {
    return translations[locale][key]
  }

  return (
    <TranslationContext.Provider value={{ locale, setLocale, translate }}>
      {children}
    </TranslationContext.Provider>
  )
}

export function useTranslate(): TranslationFunction {
  return useContext(TranslationContext).translate
}
```

How do you use them?



```
export function MountainSidebarItem() {
  const translate = useTranslate()

  return (
    <li key="Mountain" css={listItemStyle}>
      <MountainIcon />
      <span css={itemTextStyle}>{translate('SUNSET_CENTRAL.MOUNTAIN')}</span>
    </li>
  )
}
```

translate function from hook translates all strings

Sunset Central

▲ Montaña

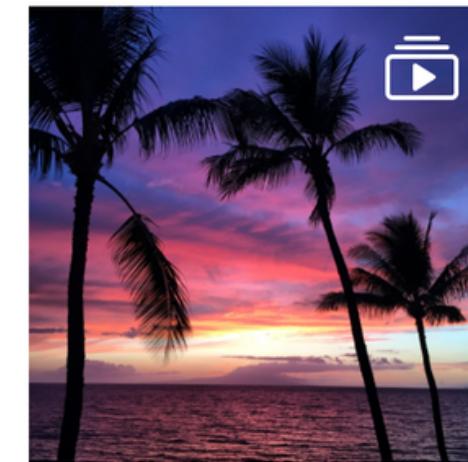
* Nieve

❖ Playa

🏜 Desierto

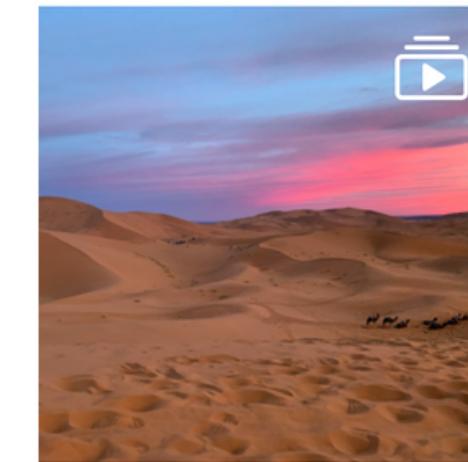
🏞 Río

🏙 Ciudad



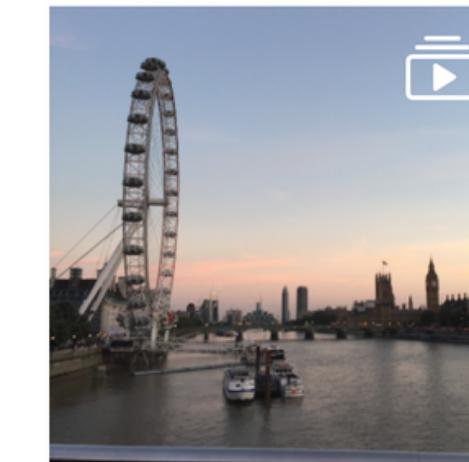
Maui, Hawái, EE. UU.

Comienza: 4/15/2021, 9:33 PM



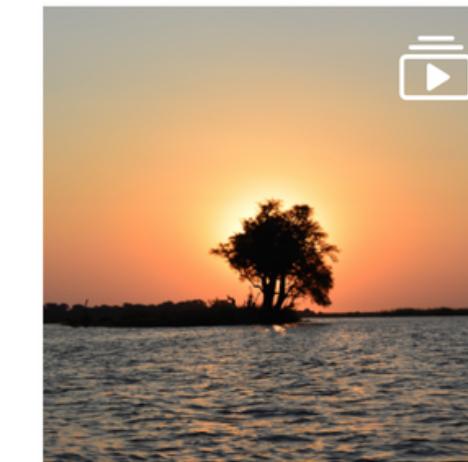
Merzouga, Marruecos

Comienza: 4/16/2021, 11:22 AM



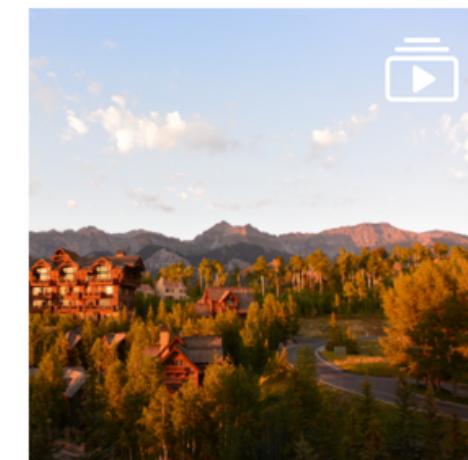
Londres, Reino Unido

Comienza: 4/16/2021, 10:59 AM



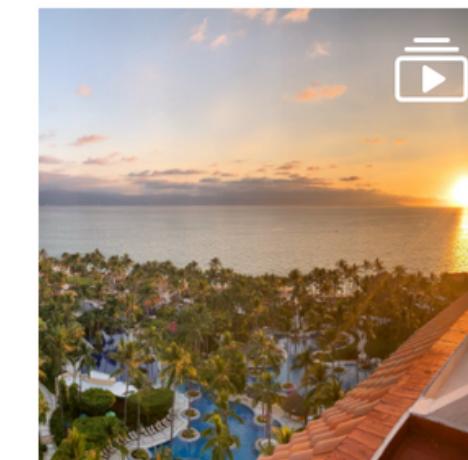
Delta del Okavango, Botswana

Comienza: 4/16/2021, 9:36 AM



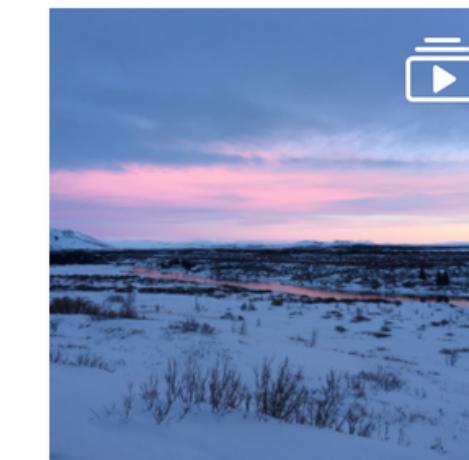
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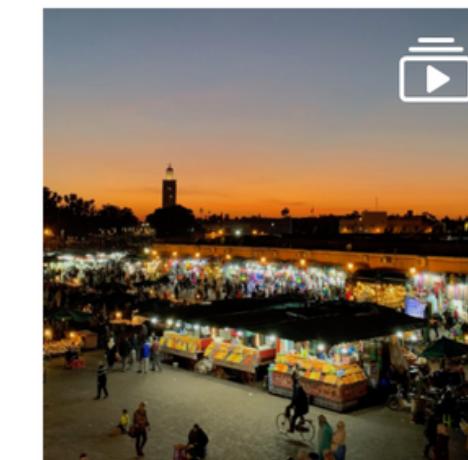
Puerto Vallarta, México

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Reykjavik, Islandia

Comienza: 4/16/2021, 12:17 PM



Marakesh, Marruecos

Comienza: 4/16/2021, 11:37 AM

@daria
caraway

Sunset Central

▲ Montaña

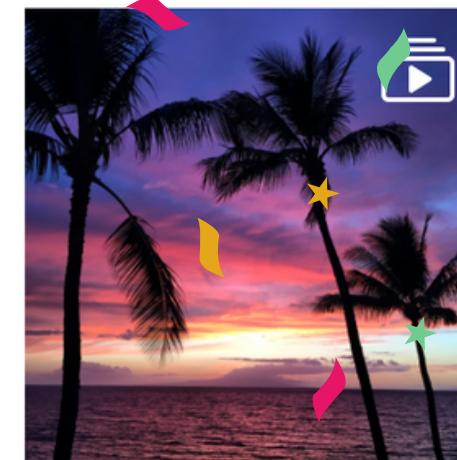
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❖ Playa

⌚ Desierto

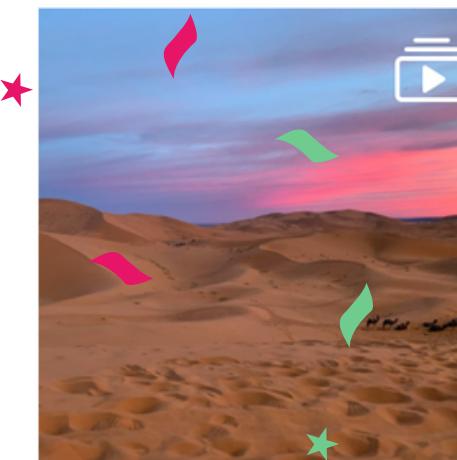
~~~~~ Río

≡ Ciudad



**Maui, Hawái, EE. UU.**

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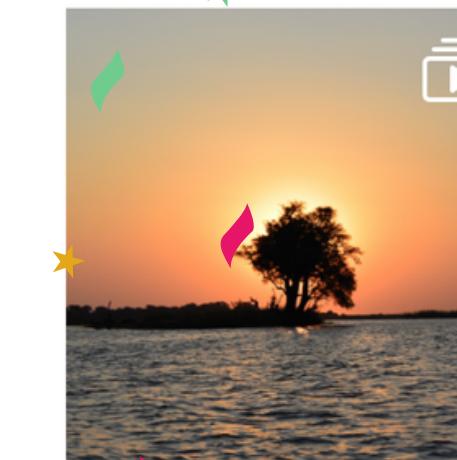
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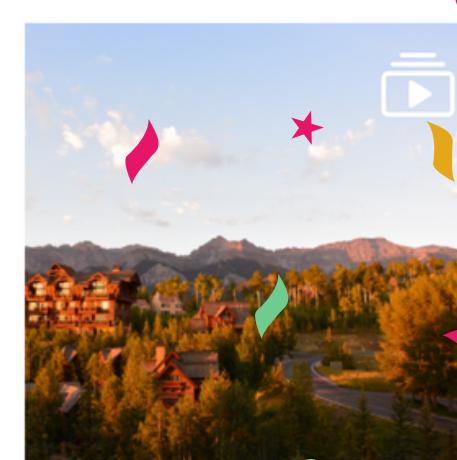
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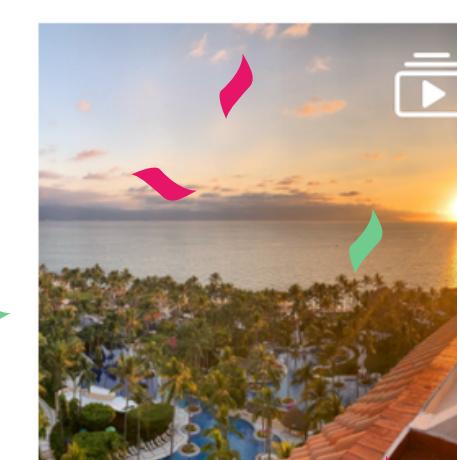
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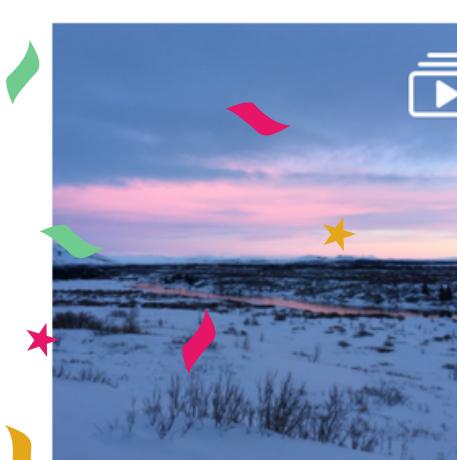
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caraway

# Sunset Central

▲ Montaña

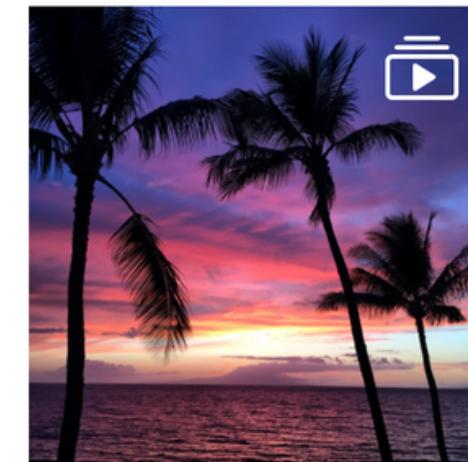
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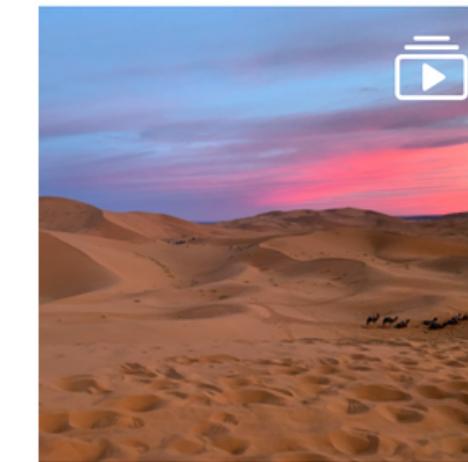
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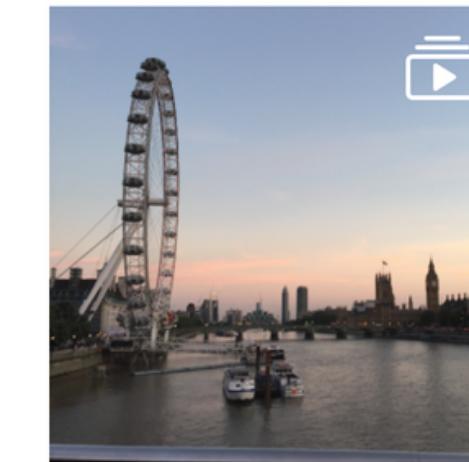
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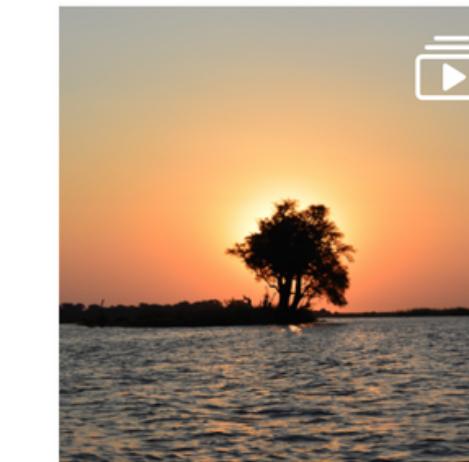
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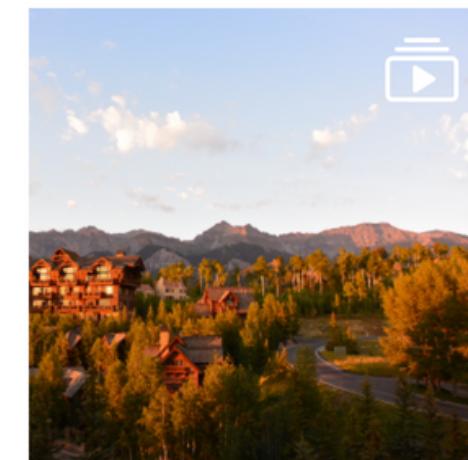
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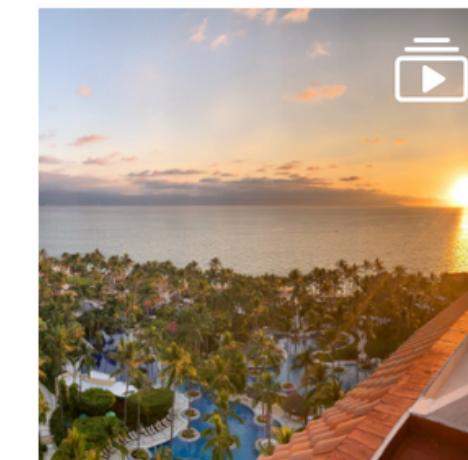
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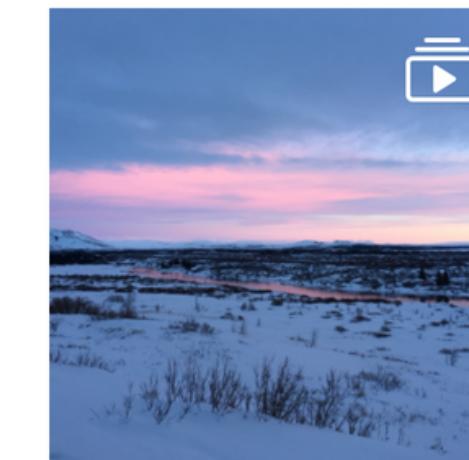
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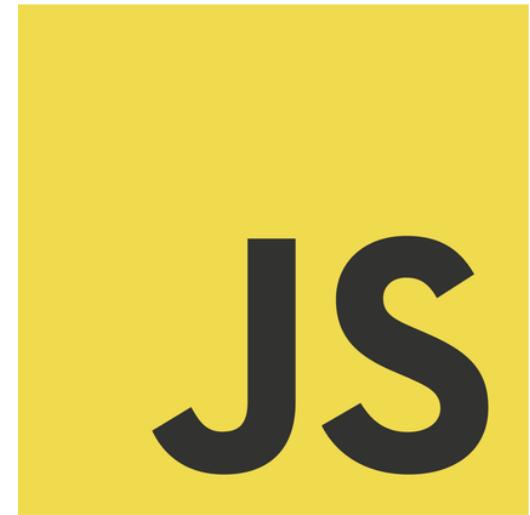
**Marakesh, Marruecos**

Comienza: 4/16/2021, 11:37 AM

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caraway

# Date Formatting

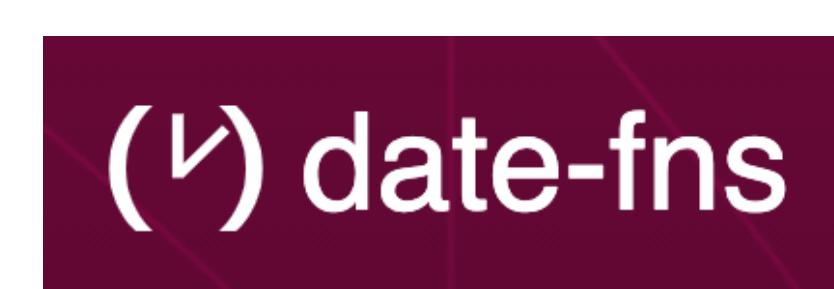
JavaScript Intl



Moment/Luxon

Luxon

Date-fns



# Date Time Formatting with JS Intl



```
const dateOptions = {  
  year: 'numeric',  
  month: 'numeric',  
  day: 'numeric',  
  hour: 'numeric',  
  minute: 'numeric',  
}  
  
export const SunsetCard = ({ location, time, image }: SunsetCardProps) => {  
  const locale = useLocale()  
  const formattedTime = new Intl.DateTimeFormat(locale, dateOptions).format(new Date(time * 1000))  
  
  return (...)
```

# Sunset Central

▲ Montaña

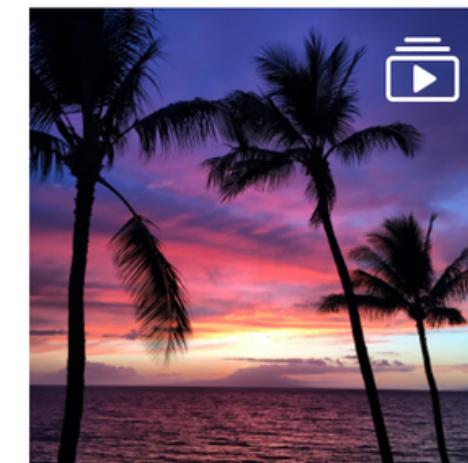
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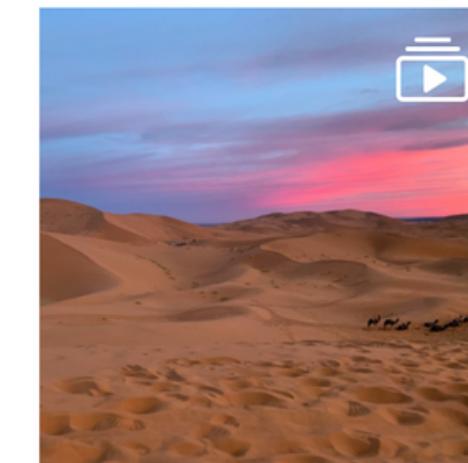
🏞 Río

🏙 Ciudad



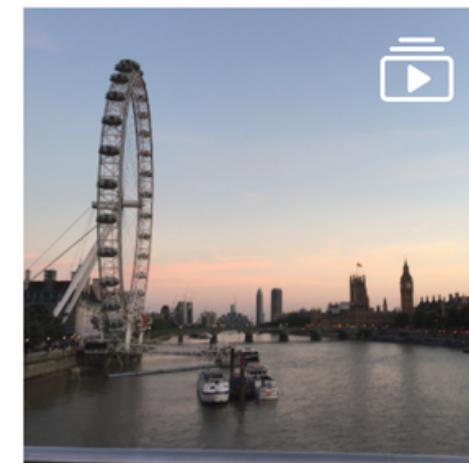
**Maui, Hawái, EE. UU.**

Comienza: 15/4/2021 21:33



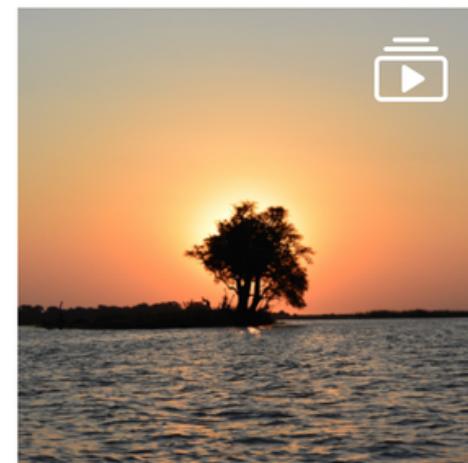
**Merzouga, Marruecos**

Comienza: 16/4/2021 11:22



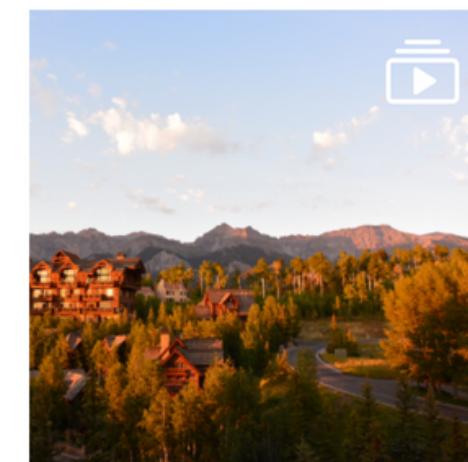
**Londres, Reino Unido**

Comienza: 16/4/2021 10:59



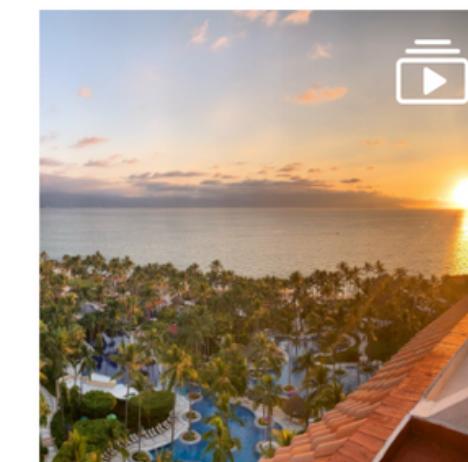
**Delta del Okavango, Botswana**

Comienza: 16/4/2021 9:36



**Telluride, Colorado, EE. UU.**

Comienza: 15/4/2021 18:15



**Puerto Vallarta, México**

Comienza: 15/4/2021 18:15



**Reykjavik, Islandia**

Comienza: 16/4/2021 12:17



**Marakesh, Marruecos**

Comienza: 16/4/2021 11:37

@daria  
caraway

# Sunset Central

▲ Montaña

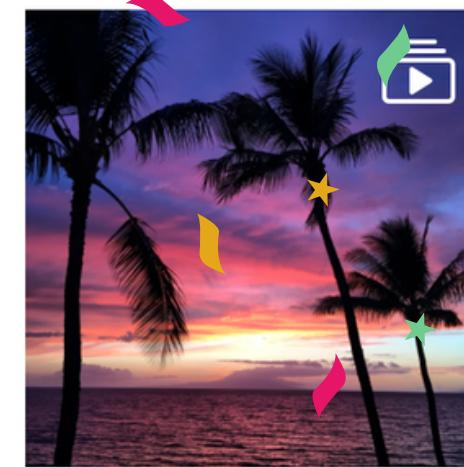
\* Nieve

❖ Playa

🏜 Desierto

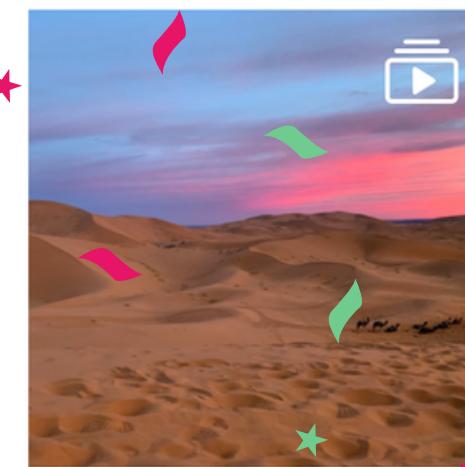
🏞 Río

🏙 Ciudad



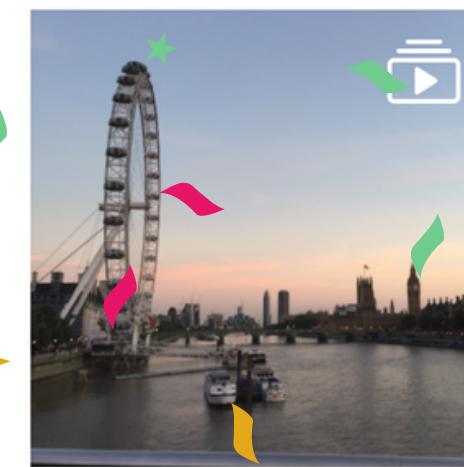
**Maui, Hawái, EE. UU.**

Comienza: 15/4/2021 21:33



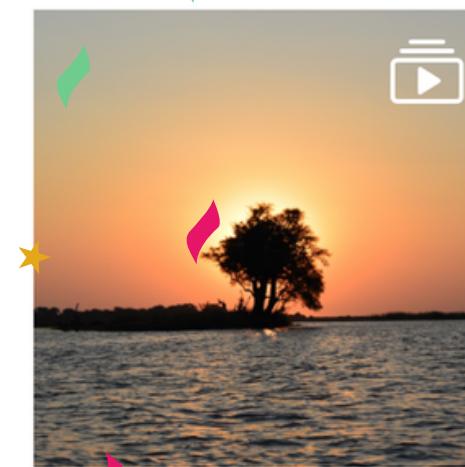
**Merzouga, Marruecos**

Comienza: 16/4/2021 11:22



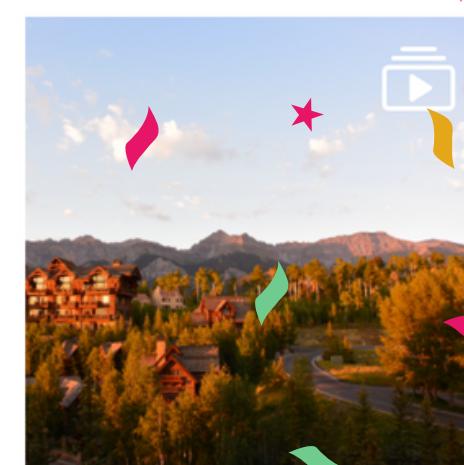
**Londres, Reino Unido**

Comienza: 16/4/2021 10:59



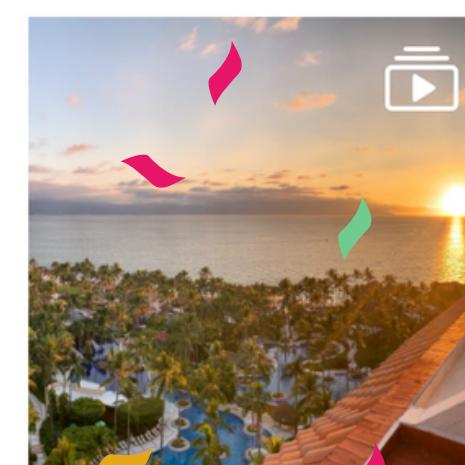
**Delta del Okavango, Botswana**

Comienza: 16/4/2021 9:36



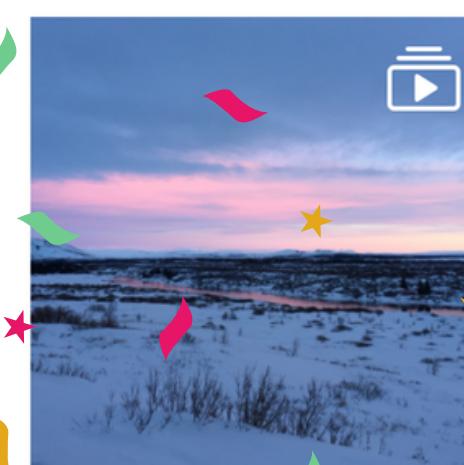
**Telluride, Colorado, EE. UU.**

Comienza: 15/4/2021 18:15



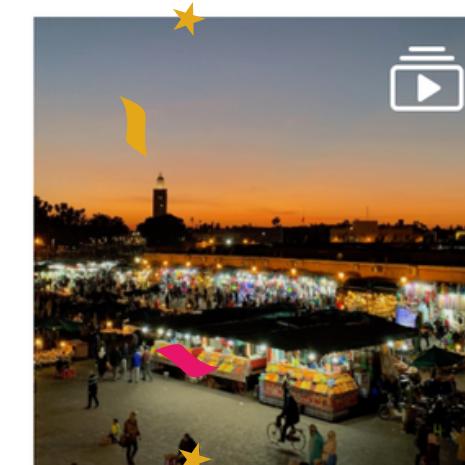
**Puerto Vallarta, México**

Comienza: 15/4/2021 18:15



**Reykjavik, Islandia**

Comienza: 16/4/2021 12:17



**Marakesh, Marruecos**

Comienza: 16/4/2021 11:37

@daria  
caraway

# Sunset Central

جبل

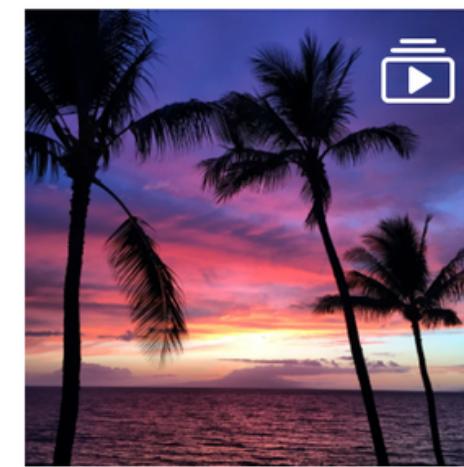
ثلج

شاطئ بحر

صحراء

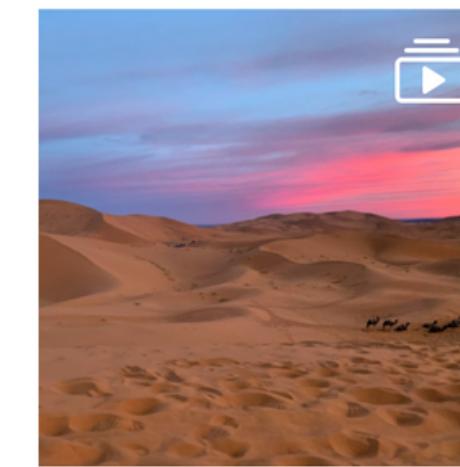
نهر

مدينة



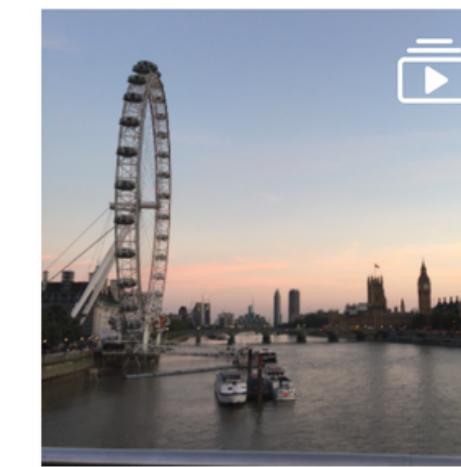
ماوي ، هاواي ، الولايات المتحدة

يبدأ: ٩:٣٣ , ٢٠٢١/٤/١٥ م



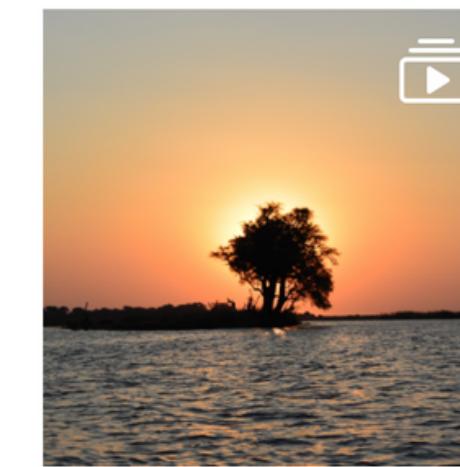
مرزوقة ، المغرب

يبدأ: ١١:٢٢ , ٢٠٢١/٤/١٦ ص



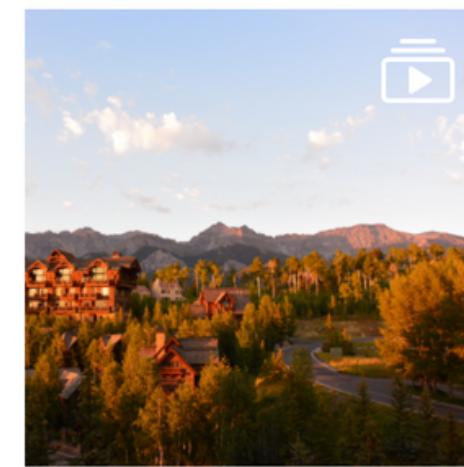
لندن، المملكة المتحدة

يبدأ: ١٠:٥٩ , ٢٠٢١/٤/١٦ ص



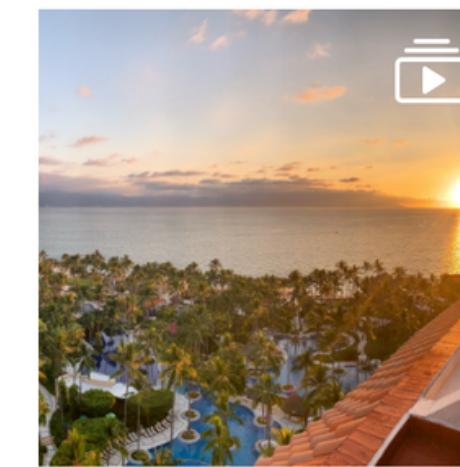
دلتا أوكافانغو ، بوتسوانا

يبدأ: ٩:٣٦ , ٢٠٢١/٤/١٦ ص



تيلورايد ، كولورادو ، الولايات المتحدة

يبدأ: ٦:١٥ , ٢٠٢١/٤/١٥ م



بويرتو فالارتا ، المكسيك

يبدأ: ٦:١٥ , ٢٠٢١/٤/١٥ م



ريكيافيك ، أيسلندا

يبدأ: ١٢:١٧ , ٢٠٢١/٤/١٦ م



مراكش ، المغرب

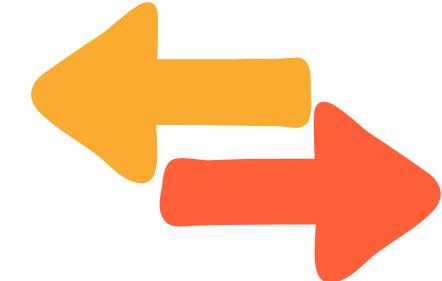
يبدأ: ١١:٣٧ , ٢٠٢١/٤/١٦ ص

# Bidirectionality

LEFT TO RIGHT (LTR)

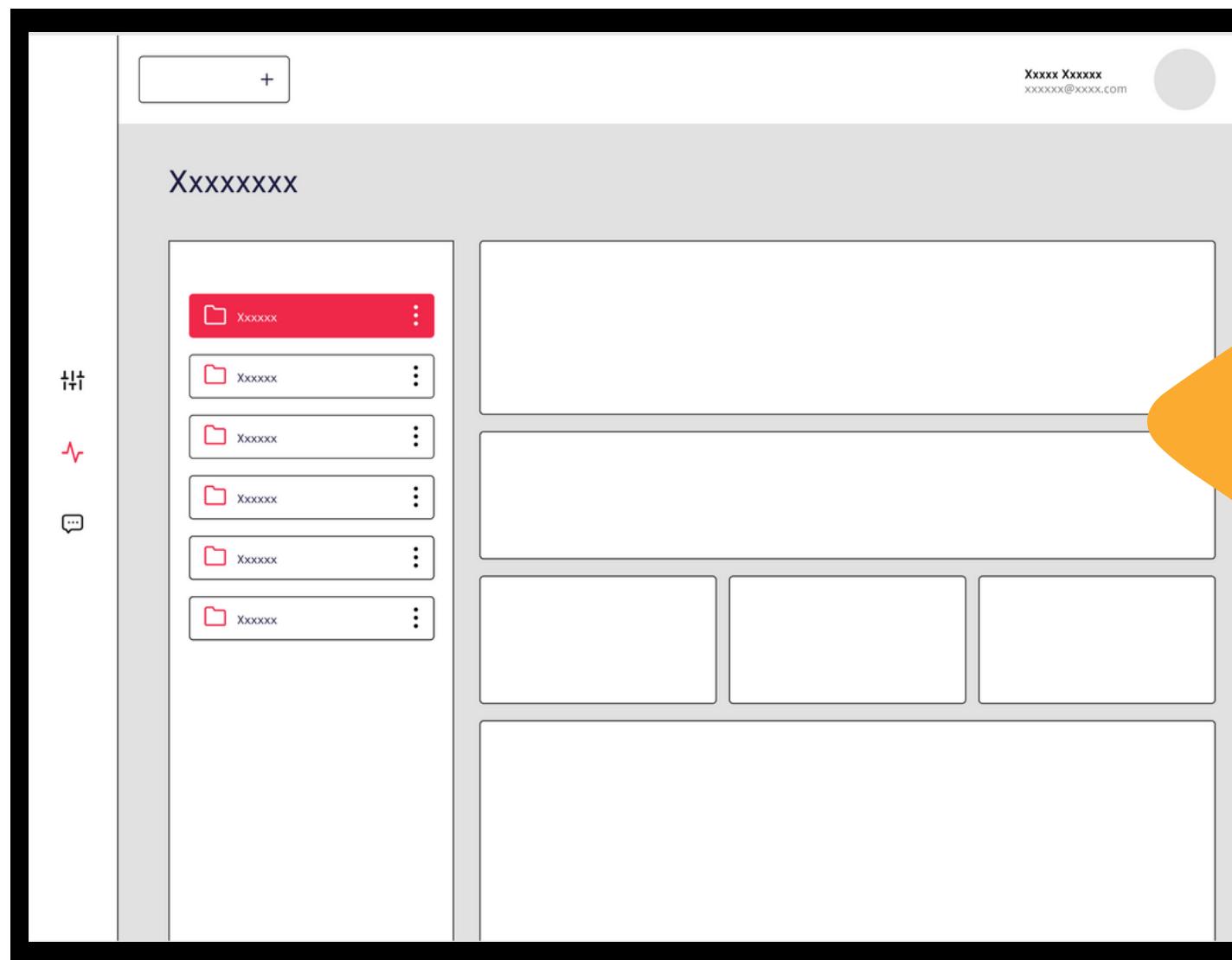


RIGHT TO LEFT (RTL)

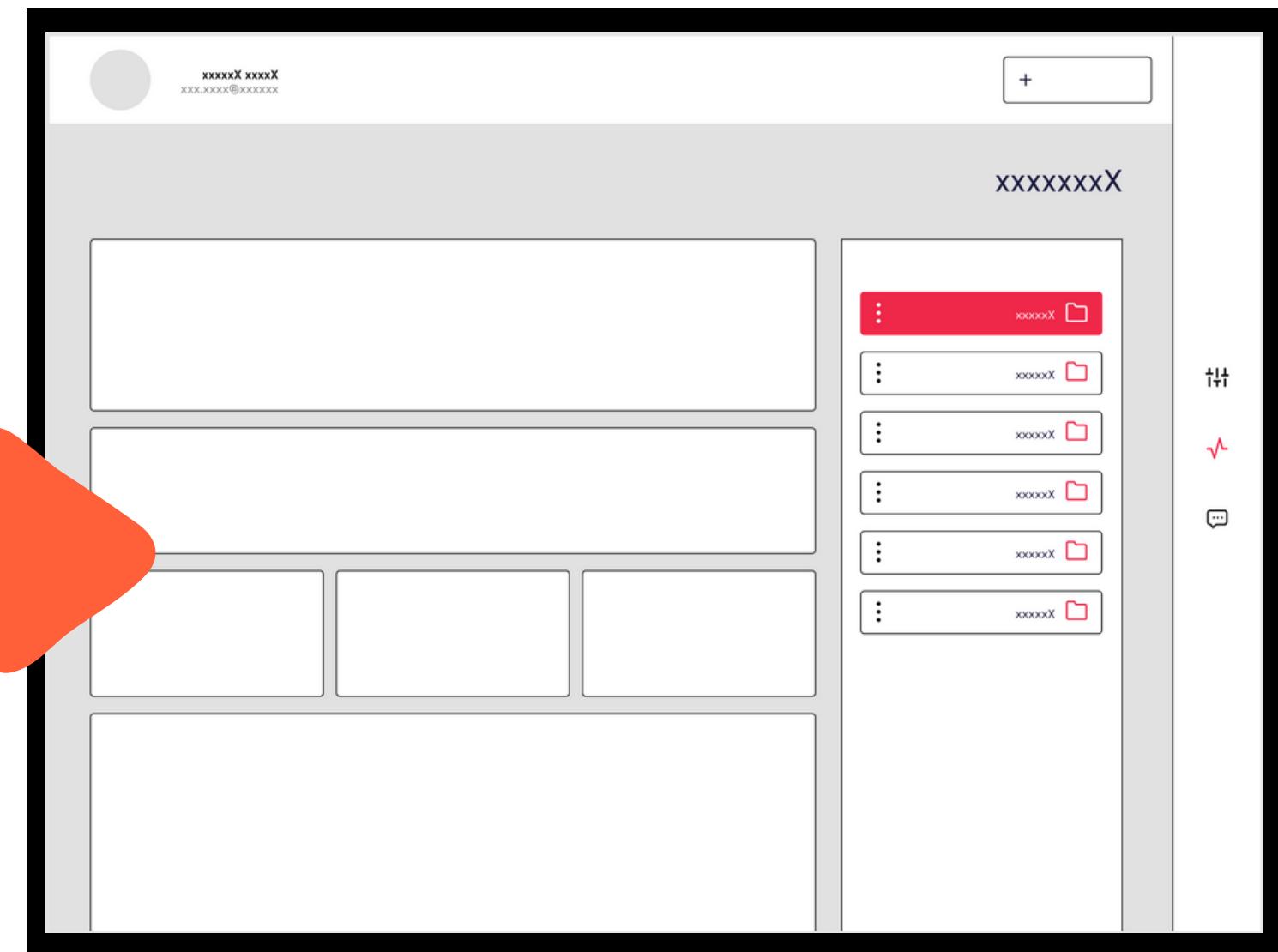


# Bidirectionality

LEFT TO RIGHT (LTR)



RIGHT TO LEFT (RTL)



# Bidirectionality

## CSS Direction Property

Flips any **non-direction specific** CSS, like text, flex-box or css-grid styles.



```
* {  
  direction: rtl;  
}
```

# Bidirectionality

## CSS Utility Libraries

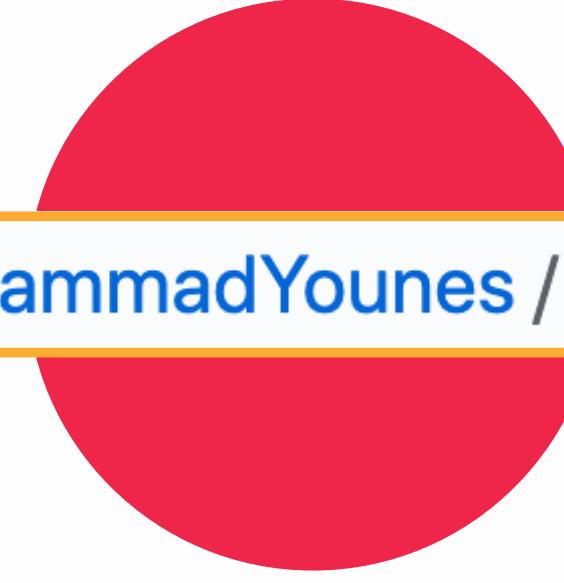
Helps flip **direction specific** CSS like padding-right or border-left.



```
{  
  padding-right: 12px;  
}  
...  
{  
  padding-left: 12px;  
}
```

# React i18n Libraries

CSS Utility



MohammadYounes / [rtlcss](#)

CSS JS Object Utility



kentcdodds / [rtl-css-js](#)

JSS Utility



alitaheri / [jss-rtl](#)

# Bidirectionality in React



```
const ThemeContext = createContext<ThemeContextProps>(themeContextDefault)

export function ThemeProvider({ defaultDirection, children }: ThemeProviderProps) {
  const [direction, setDirection] = useState(defaultDirection)

  return (
    <ThemeContext.Provider value={{ direction, setDirection }}>{children}</ThemeContext.Provider>
  )
}

export function useThemeDirection(): ContentDirection {
  return useContext(ThemeContext).direction
}
```

# Bidirectionality in React



```
export function useStyles() {
  const direction = useThemeDirection()

  const applyStyles = (styles: CSSObject) => {
    if (direction === 'rtl') {
      return css(rtlCSSJS(styles))
    }
    return css(styles)
  }

  return applyStyles
}
```

utility hook that returns applyStyles function

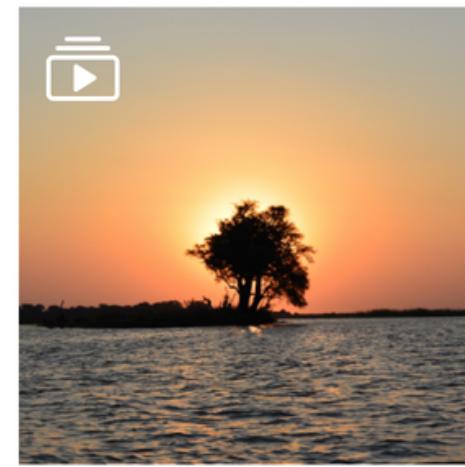
# CSS RTL Utility Usage



```
export function MountainSidebarItem() {
  const translate = useTranslate()
  const applyStyles = useStyles()

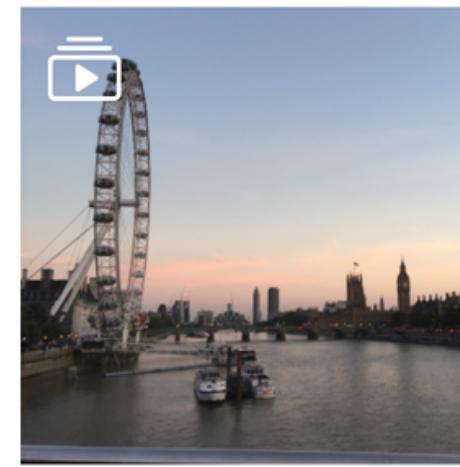
  return (
    <li key="Mountain" css={applyStyles(listItemStyle)}>
      <MountainIcon />
      <span css={itemTextStyle}>{translate('SUNSET_CENTRAL.MOUNTAIN')}</span>
    </li>
  )
}
```

# Sunset Central



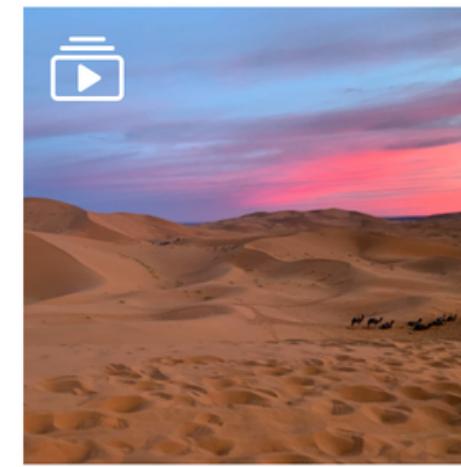
دلتا أوكافانغو ، بوتسوانا

يبدأ: ٢٠٢١/٤/١٦، ٩:٣٦ ص



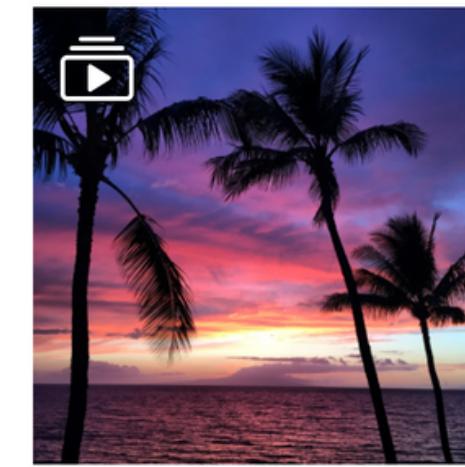
لندن، المملكة المتحدة

يبدأ: ٢٠٢١/٤/١٦، ١٠:٥٩ ص



مرزوقه ، المغرب

يبدأ: ٢٠٢١/٤/١٦، ١١:٢٢ ص



ماوي ، هواي ، الولايات المتحدة

يبدأ: ٢٠٢١/٤/١٥، ٩:٣٣ م



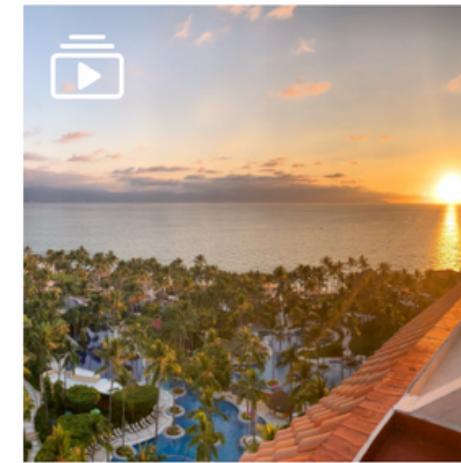
مراكش ، المغرب

يبدأ: ٢٠٢١/٤/١٦، ١١:٣٧ ص



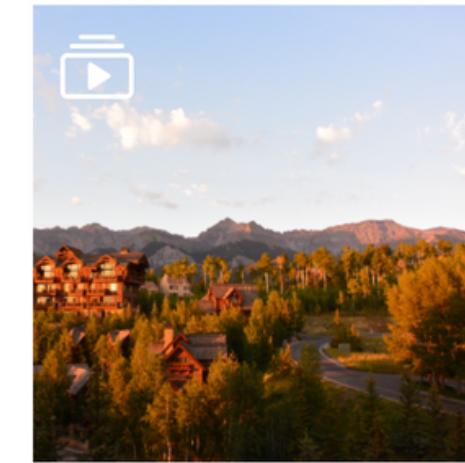
ريكيافيك ، أيسلندا

يبدأ: ٢٠٢١/٤/١٦، ١٢:١٧ م



بويرتو فالارتا ، المكسيك

يبدأ: ٢٠٢١/٤/١٥، ٦:١٥ م



تيلورايد ، كولورادو ، الولايات المتحدة

يبدأ: ٢٠٢١/٤/١٥، ٦:١٥ م

جبل

ثلج

شاطئ بحر

صحراء

نهر

مدينة

# I18n Internationalization

Architecting your app so  
when I1On occurs things  
work as expected.

**Learning and  
maintaining languages is  
hard... but architecting  
your react app to  
support multiple locales  
doesn't have to be.**

# Thank You

@dariacaraway

resources @

<https://github.com/darcar31/slides/tree/main/2021/reactBrussels>