

# I18N and L10N

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Sep. 2022

# Agenda

- What is i18n?
- What is l10n?
- i18n and l10n
- Basic Guidelines
- What needs to be localized
- What does NOT need to be put into l10n resource
- Q&A

# What is i18n?

- i18n: internationalization

Make an application **international**; that is, make it able to support virtually any language or local setting on Earth without modify source code.

[https://wiki.mageia.org/en/What\\_is\\_i18n,\\_what\\_is\\_l10n](https://wiki.mageia.org/en/What_is_i18n,_what_is_l10n)

## One single application for ALL countries.

# What is i18n?

Examples:

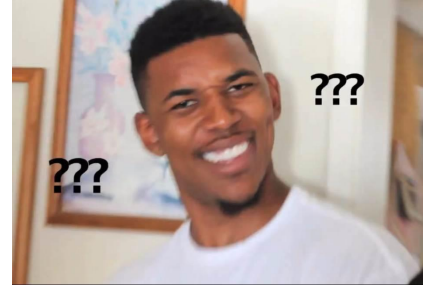
- Software: Mobile phone camera.



# What is i18n?

Examples:

- Car: Wheel...



# What is i18n?

Examples:

- Car: Wheel...



Men in Black II "What is a Gameboy"

<https://www.youtube.com/watch?v=IDtwTqBwqwk&t=1m5s>

# What is l10n?

- l10n: localization

Make an application **localized**; that is, work for a given local and concrete context, adapted to the user.

[https://wiki.mageia.org/en/What\\_is\\_i18n,\\_what\\_is\\_l10n](https://wiki.mageia.org/en/What_is_i18n,_what_is_l10n)

## Different applications for different countries?

# What is I10n?

Examples:

- Software: Disallow to disable Japan mobile phone's camera shutter sound.  
<https://www.engadget.com/2016/09/30/japans-noisy-iphone-problem/>



# What is l10n?

Examples:

- Car: Location of the wheel. Left or Right?



# i18n and l10n

Conflict concept?

Not only do not conflict with each other, but also complement each other.

i18n makes it available to do l10n.

l10n increase its i18n.

# i18n and l10n



# Basic Guidelines

- [Design for multi-languages](#). Not only designed for English/native language but also includes support for [other languages/cultures](#).



# Basic Guidelines

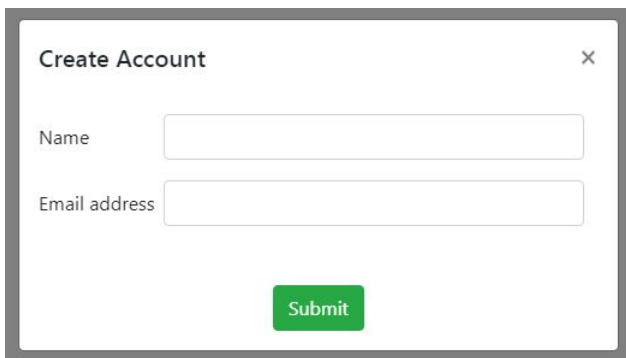
- **Design for multi-languages.** Not only designed for English/native language but also includes support for other languages/cultures.
- **Not hardcoded.** Make l10n variables.

# Basic Guidelines

- **Design for multi-languages.** Not only designed for English/native language but also includes support for **other languages/cultures**.
- **Not hardcoded.** Make l10n variables.
- Keep sentences **complete** and **meaningful**.

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Layout: Allow **extra space** for translations.

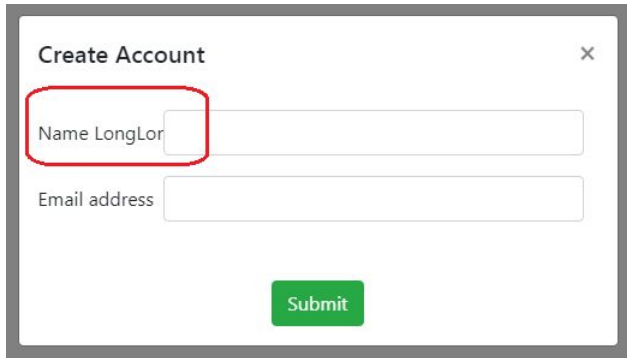


Create Account x

Name

Email address

This form shows a standard-width 'Create Account' dialog. The 'Name' and 'Email address' input fields are relatively narrow, and the 'Submit' button is centered at the bottom.

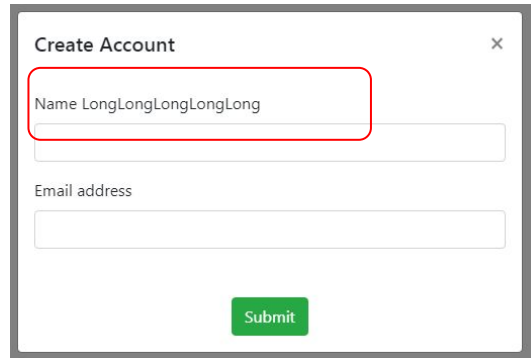


Create Account x

Name LongLor

Email address

This form shows the 'Name' input field with the text 'Name LongLor' and a red box highlighting the extra space provided for translations. The 'Email address' field and 'Submit' button remain in their original positions.



Create Account x

Name LongLongLongLongLong

Email address

This form shows the 'Name' input field with the text 'Name LongLongLongLongLong' and a red box highlighting the extra space provided for translations. The 'Email address' field and 'Submit' button remain in their original positions.

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Layout: Allow **extra space** for translations.
  - Because English is a **compact size** language. When the text string is translated into other languages, its **text size will increase**.

Language	Translation	Ratio	No. of characters in English source	Average expansion
Korean	조회	0.8	Up to 10	200-300%
English	views	1	11-20	180-200%
Chinese	次檢視	1.2	21-30	160-180%
Portuguese	visualizações	2.6	31-50	140-160%
French	consultations	2.6	51-70	151-170%
German	-mal angesehen	2.8	Over 70	130%
Italian	visualizzazioni	3		



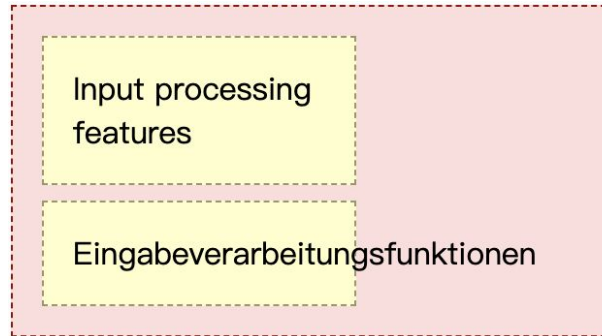
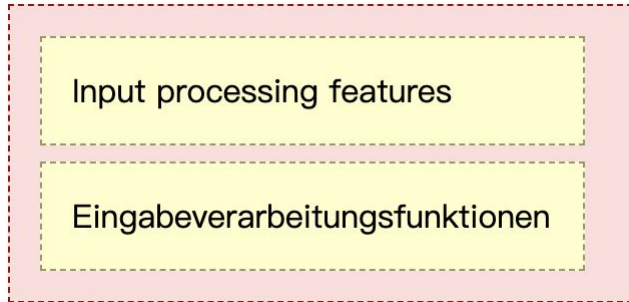
# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Layout: Allow **extra space** for translations.
  - **Right-to-left (RTL)**. e.g. Arabic
  - **Compound nouns**. e.g. German

Language	Text
in English	Input processing features
in Arabic	وظائف معالجة المدخلات
in German	Eingabeverarbeitungsfunktionen
in French	Fonctions de traitement d'entrée

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Compound nouns



Overflowed!

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Compound nouns

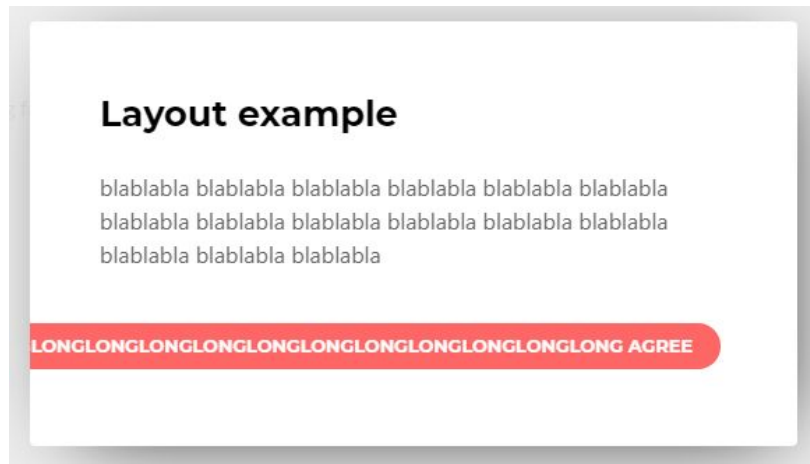
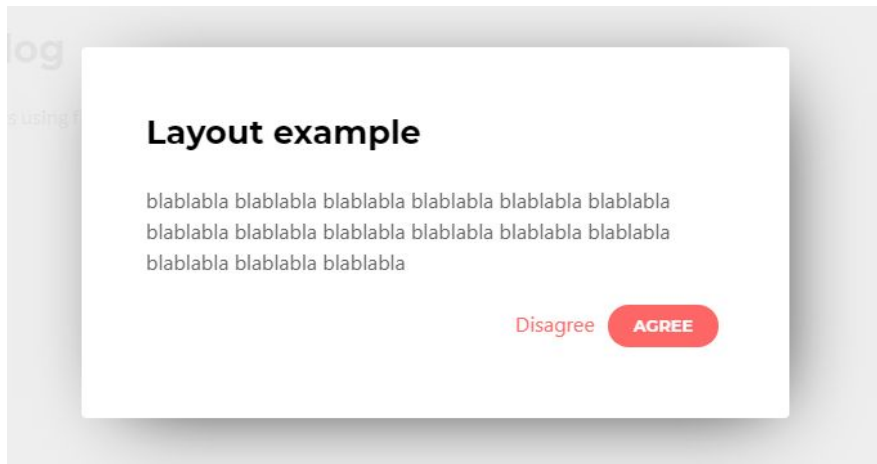


Worked: Break the word

Better: Break the word with hyphen

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Layout: Allow **extra space** for translations.



# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Character width
  - Line height: 1.6

Leading the Web to  
its full potential...

การนำไปสู่ Web ที่เต็ม  
ไปด้วยศักยภาพ

# Basic Guidelines - Layout / Text Space

- Design for multi-languages.
  - Abbreviations?
    - It may not be a good idea in some languages. e.g. Arabic

The problems of Translating Acronyms from English into Arabic

[https://www.researchgate.net/publication/340038543\\_The\\_problems\\_of\\_Translating\\_Acronyms\\_from\\_English\\_into\\_Arabic](https://www.researchgate.net/publication/340038543_The_problems_of_Translating_Acronyms_from_English_into_Arabic)

# Basic Guidelines - Color / Font-Family

- Design for multi-languages.
  - **Color/Font-family.** Be **culture sensitive**.

A **white envelope** with money inside.  
⇒ What does it mean to you?



The meaning in Taiwan is different from Japan.  
[http://www.shamitsu.com/2018/10/blog-post\\_4.html](http://www.shamitsu.com/2018/10/blog-post_4.html)

# Basic Guidelines - Functionality

- Design for multi-languages.
  - Functionality.





# Basic Guidelines - Functionality

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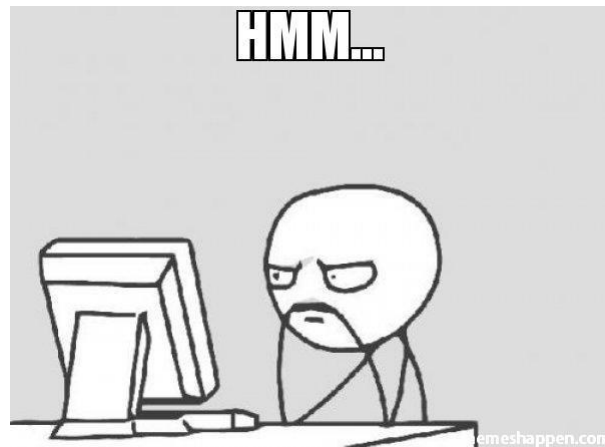
12-hour clock:

02 ▾ : 16 ▾ PM ▾

24-hour clock:

14 ▾ : 16 ▾

Which one is recommended?



# Basic Guidelines - Functionality

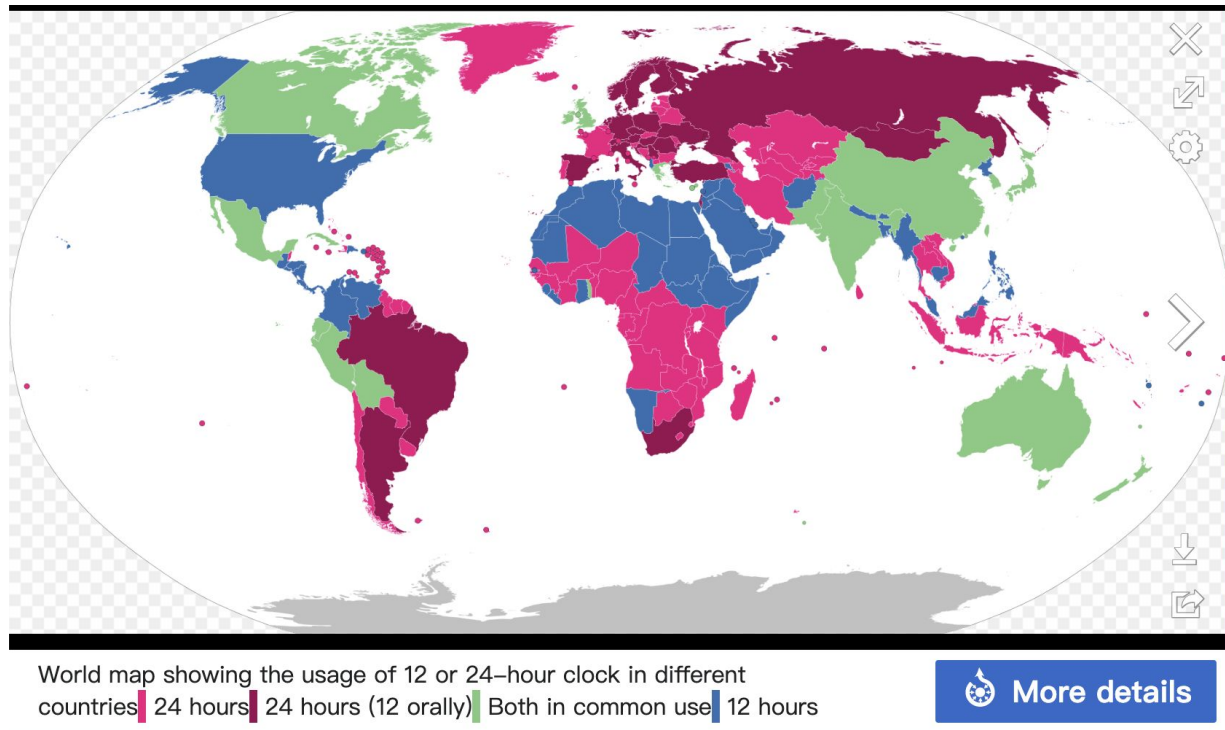
- Design for multi-languages.
  - Functionality.

12-hour clock:

02 ▾ : 16 ▾ PM ▾

24-hour clock:

14 ▾ : 16 ▾



# Basic Guidelines - Functionality

- Design for multi-languages.
  - Functionality.

Noon = ?



# Basic Guidelines - Functionality

- Design for multi-languages.
  - Functionality.

Device or style	Midnight / Start of day	Noon	Midnight / End of day
Written 24-hour time	00:00	12:00	24:00
Digital watches	12:00 AM	12:00 PM	
U.S. Government Publishing Office (2000)	midnight	12 a.m. noon	12 p.m. midnight
U.S. Government Publishing Office (2008)	12 a.m. 12 midnight	12 p.m. 12 noon	12 midnight

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# Basic Guidelines - Functionality

- Design for multi-languages.
  - Functionality.

12-hour clock	24-hour clock
02:16 p.m.	14:16
午後 2 時	14:00
02:16 a.m.	02:16
12:00 p.m.	12:00

午後 12 時 = ?

# Basic Guidelines - Functionality


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  - Functionality.

Device or style	Midnight / Start of day	Noon	Midnight / End of day
Written 24-hour time	00:00	12:00	24:00
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Japanese legal convention	0:00 a.m.	12:00 a.m.	12:00 p.m.

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U.S. Government Publishing Office (2008)	12 a.m. 12 midnight	12 p.m. 12 noon	12 midnight
Japanese legal convention	0:00 a.m.	12:00 a.m.	12:00 p.m.
Japanese common usage	0:00 a.m.	0:00 p.m. 12:00 a.m.	12:00 p.m.



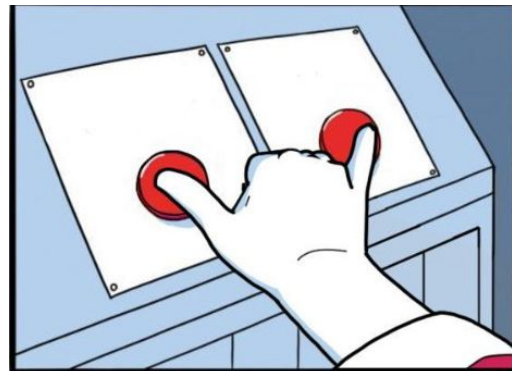


# Basic Guidelines - Functionality

- Design for multi-languages.
  - Functionality.

Noon = 午前 12 時 = 午後 0 時

Midnight = 午後 12 時 = 午前 0 時



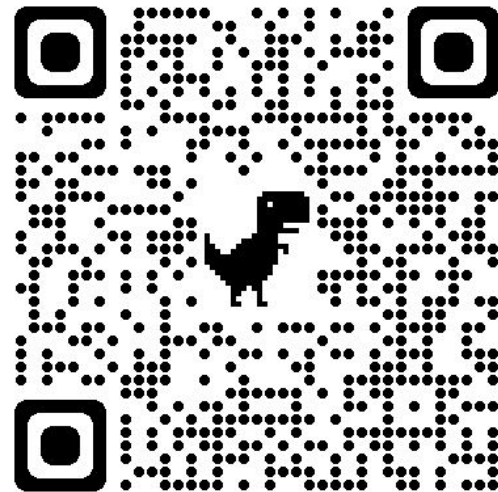
# Basic Guidelines - Unicode (UTF-8)

- Design for multi-languages.
  - Encoding/Character set: UTF-8.

But...

<https://www.fileformat.info/info/unicode/block/nushu/utf8test.htm>

<https://en.wikipedia.org/wiki/N%C3%BCshu>



## Device support matters


- Encoding
- Font-family

### Nüşu in Unicode [\[edit\]](#)

*Main article: Nushu (Unicode block)*

Nüşu is included in the [Unicode Standard](#) under the name "Nushu" (because Unicode character names, block names, and version numbers are all in English). It was added to Unicode version 10.0 which was released in June 2017. An [iteration mark](#) for Nüşu, U+16FE1 | NUSHU ITERATION

The Unicode block for Nüşu is U+1B170–U+1B2FF:

Nushu <sup>[1][2]</sup>																
Official Unicode Consortium code chart  (PDF)																
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
U+1B17x																
U+1B18x																34

# Basic Guidelines - Complete and Meaningful String

- Keep sentences **complete** and **meaningful**. Do not split or cut sentences.

**Bad:** Split the sentence.

"Hi " + "Wade" + ", are you ready to race?"

Name: Wade

Hi XXXX, are you ready to race?

L10N resource

```
{
  "001": "Hi ",
  "002": "Internationalization (i18n) and localization (L10n)",
  "003": "Internationalization is the process of designing a software application",
  "004": "Not only picking i18n framework & apply it to front-end codebase",
  "005": "technical requirements",
  "006": ", are you ready to race?",
}
```

# Basic Guidelines - Complete and Meaningful String

- Keep sentences **complete** and **meaningful**. Do not split or cut sentences. Use **variables**.

**Better:** Keep the sentence complete, and apply **variables**.

```
"Hi ${playerName}, are you ready to race?"
```

L10N resource

```
{  
  "001": "Hi ${playerName}, are you ready to race?",  
  "002": "Internationalization (i18n) and localization (L10n)",  
  "003": "Internationalization is the process of designing a software application",  
  "004": "Not only picking i18n framework & apply it to front-end codebase",  
  "005": "technical requirements",  
}
```

# Basic Guidelines - Complete and Meaningful String

- Keep sentences **complete** and **meaningful**.

Question	Answer
What kinds of games does Alice play?	<input type="text"/>
What kinds of drinks does Alice want?	<input type="text"/>
What kinds of movies does Alice like?	<input type="text"/>
What kinds of dogs does Alice have?	<input type="text"/>

# Basic Guidelines - Complete and Meaningful String

- Make it as template?

Option A	Option B
<pre>UserName = Alice; Data = [   { 0: What kinds of games does \${UserName} play? },   { 0: What kinds of drinks does \${UserName} want? },   { 0: What kinds of movies does \${UserName} like? },   { 0: What kinds of dogs does \${UserName} have? }, ];  Loop in Data:   output {0} with UserName</pre>	<pre>UserName = Alice; Data = [   { 0: game, 1: play },   { 0: drinks, 1: want },   { 0: movies, 1: like },   { 0: dogs, 1: have }, ];  Loop in Data:   output: What kinds of {0} does \${UserName} {1}?</pre>

# Basic Guidelines - Complete and Meaningful String

- Make it as template?

English	Japanese
What kinds of <b>games</b> does <b>Alice</b> <b>play</b> ?	<b>アリス</b> はどのような <b>ゲーム</b> をやっていますか？
What kinds of <b>drinks</b> does <b>Alice</b> <b>want**</b> ?	<b>アリス</b> はどんな <b>飲み物を飲みたい</b> ですか？
What kinds of <b>movies</b> does <b>Alice</b> <b>like</b> ?	<b>アリス</b> はどんな <b>映画</b> が好きですか？
What kinds of <b>dogs</b> does <b>Alice</b> <b>have</b> ?	<b>アリス</b> にはどんな <b>犬</b> がいますか？

English	Japanese	Chinese
<b>Want to drink</b> (2 verbs)	<b>飲みたい</b> (1 verb)	<b>想喝</b> (2 verbs)

# Basic Guidelines - Grammar Matters

- I10n resource is **NOT** template between different sentences.
- **Grammar matters**
  - Leave grammar in I10n resource, and let translator handle it.





# Basic Guidelines - Grammar Matters

- I10n resource is **NOT** template between different sentences.
- **Grammar matters**
  - Leave grammar in I10n resource, and let translator handle it.

English: Invalid license

Adjective + Object

French: Licence non valide

Object + Adverb + Adjective

# Basic Guidelines

- **Design for multi-languages.** Not only designed for English/native language but also includes support for **other languages/cultures**.
  - Layout / Text Space (Text size in translation).
  - Color/Font-family.
  - Functionality.
  - Encoding/Character set: UTF-8.
  - Structure of the program.
  - Test plane.
- **Not hardcoded.** Make I10n variables.
  - Extract all I10n targets out of the source code, and put them into the I10n resource folder/files.
- Keep sentences **complete** and **meaningful**.
  - Do not split or cut sentences.

# What needs to be localized

- All [displayable text](#).

# What needs to be localized

- Punctuation.
  - Comma, Period, Ellipsis, Parentheses...

English: I have a pen, and an apple.

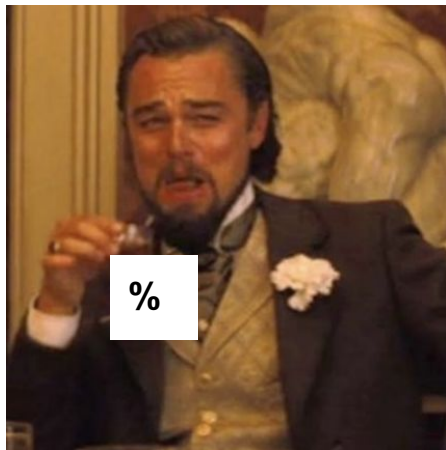
Chinese: 我有一枝筆, 和一顆蘋果。



- Symbols and Signs.
  - Percent sign, ...

English: 40% chance of rain for Ohio State-Nebraska game

Turkish: Ohio State-Nebraska oyunu için% 40 yağmur ihtimali



# What needs to be localized

- Date/Time.

09/06/2022



JAKE-CLARK.TUMBLR

# What needs to be localized

- Date/Time.

09/06/2022

USA (mm/dd/yyyy): September 6th

France (dd/mm/yyyy): June 9th

Format matters

# What needs to be localized

- Date/Time.

ISO-8601: 2018-04-05

Taiwan: 民國 107 年 4 月 5 日

Japan: 平成 30 年 4 月 5 日

USA: April 5, 2018

# What needs to be localized

- Date/Time.

Timestamp: 1569574800

Taiwan (UTC+8): 17:00

Japan (UTC+9): 18:00

Timezone matters



# What needs to be localized

- Numbers with symbols.

$12,345 > 100$



JAKE-CLARK.TUMBLR

# What needs to be localized

- Numbers with symbols.

12,345

How much?

USA : 12 thousands

France: 12

**Format matters**

[https://en.wikipedia.org/wiki/Decimal\\_separator#Examples\\_of\\_use](https://en.wikipedia.org/wiki/Decimal_separator#Examples_of_use)

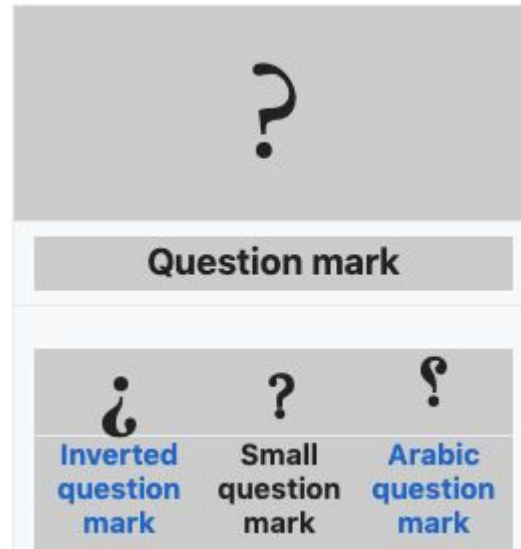
# What needs to be localized

- Images with wording in it.



# What needs to be localized

- Icon (Sometimes).
  - Question mark



# What needs to be localized

- All displayable text.
- Punctuation, Symbols and Signs.
- Date/Time.
  - Format (yyyy/mm/dd)
  - Timezone (UTC+8)
- Numbers with symbols.
  - Decimal point/comma
  - Thousands Separators
- Images with wording in it.
- Icons (Sometimes).
  - Question mark

# What does NOT need to be put into l10n resource

- Source code.
  - Original: To learn more, please check `<a href='https://example.com/'>Online help</a>`.
  - Suggest: To learn more, please check `${link__OnlineHelp}`.

# What does NOT need to be put into l10n resource

- Spical token used by our program.
  - Original: Use \* to represent any series of characters.

We don't want it become: 使用 \* 符號代表任意字元。

(Note: \* is not \* )

- Suggest:  
Use \${token\_\_Asterisk} to represent any series of characters.

# What does NOT need to be put into l10n resource

- Dynamic content.
  - Original: Disk usage: 80%

We cannot list them all.

- Suggest: Disk usage: \${number}%



# What does NOT need to be put into l10n resource

- Source code.
  - To learn more, please check [here='https://example.com/'](https://example.com/)Online help.
- Spical token.
  - Use \* to represent any series of characters.
- Dynamic content.
  - Disk usage: 80%

# Basic Guidelines

- Design with i18n and l10n.
- All **displayable** Text, Date/Time, Numbers, Punctuation, Symbols, Signs, Images and Icons (Some cases).
- Keep sentences **complete** and **meaningful**.
- L10N resource is **NOT** template between different sentences.
- Do not include **no-need-to-translate** element into the l10n resource.
  - Source code.
  - Spical token.

# Test i18n/l10n

- Pseudolocalization / Pseudo-testing  
<https://en.wikipedia.org/wiki/Pseudolocalization>

Q&A

Thank You

# Reference

[1] What is i18n, what is l10n

[https://wiki.mageia.org/en/What\\_is\\_i18n,\\_what\\_is\\_l10n](https://wiki.mageia.org/en/What_is_i18n,_what_is_l10n)

[2] i18n vs l10n — what's the diff?

<https://blog.mozilla.org/l10n/2011/12/14/i18n-vs-l10n-whats-the-diff/>

[3] Localization vs. Internationalization

<https://www.w3.org/International/questions/qa-i18n.en>

[4] Localization

<https://developer.mozilla.org/en-US/docs/Glossary/Localization>

[5] L10N and I18N Best Practices

<https://www.infragistics.com/community/blogs/b/devtoolsguy/posts/l10n-and-i18n-best-practices>

[6] Introduction to Localization and Internationalization

<https://www.infragistics.com/community/blogs/b/devtoolsguy/posts/introduction-to-localization-and-internationalization>

# Reference

[7] 12-hour clock - Confusion at noon and midnight

[https://en.wikipedia.org/wiki/12-hour\\_clock#Confusion\\_at\\_noon\\_and\\_midnight](https://en.wikipedia.org/wiki/12-hour_clock#Confusion_at_noon_and_midnight)

[8] 24-hour clock

[https://en.wikipedia.org/wiki/24-hour\\_clock](https://en.wikipedia.org/wiki/24-hour_clock)

[9] Percent sign

[https://en.wikipedia.org/wiki/Percent\\_sign](https://en.wikipedia.org/wiki/Percent_sign)

[10] Date format by country

[https://en.wikipedia.org/wiki/Date\\_format\\_by\\_country](https://en.wikipedia.org/wiki/Date_format_by_country)

[11] Decimal separator

[https://en.wikipedia.org/wiki/Decimal\\_separator#Examples\\_of\\_use](https://en.wikipedia.org/wiki/Decimal_separator#Examples_of_use)

# Reference

[12] The problems of Translating Acronyms from English into Arabic

[https://www.researchgate.net/publication/340038543\\_The\\_problems\\_of\\_Translating\\_Acronyms\\_from\\_English\\_into\\_Arabic](https://www.researchgate.net/publication/340038543_The_problems_of_Translating_Acronyms_from_English_into_Arabic)

[13] UTF-8 Browser Test for Unicode Block 'Nushu'

<https://www.fileformat.info/info/unicode/block/nushu/utf8test.htm>

[14] Nüshu

<https://en.wikipedia.org/wiki/N%C3%BCshu>

[15] Pseudolocalization

<https://en.wikipedia.org/wiki/Pseudolocalization>



# Reference

[16] Japan's noisy iPhone problem

<https://www.engadget.com/2016/09/30/japans-noisy-iphone-problem/>

[17] How to use blessing bag jp

<https://www.shamitsu.com/2018/10/how-to-use-blessing-bag-jp.html>