デジタル技術と言語
Digital Technology and Language

Keiko Okawa
Keio University Graduate School of Media Design

Oxford Day 2017 : Power of Language
October 22nd, 2017 (Sun)

Keio University Graduate School
of Media Design
(KMD)
Design a global learning experience

Designing online courses for social learning

Research Institute of
Digital Media and Content
Keio University
(DMC)

2016/11/24

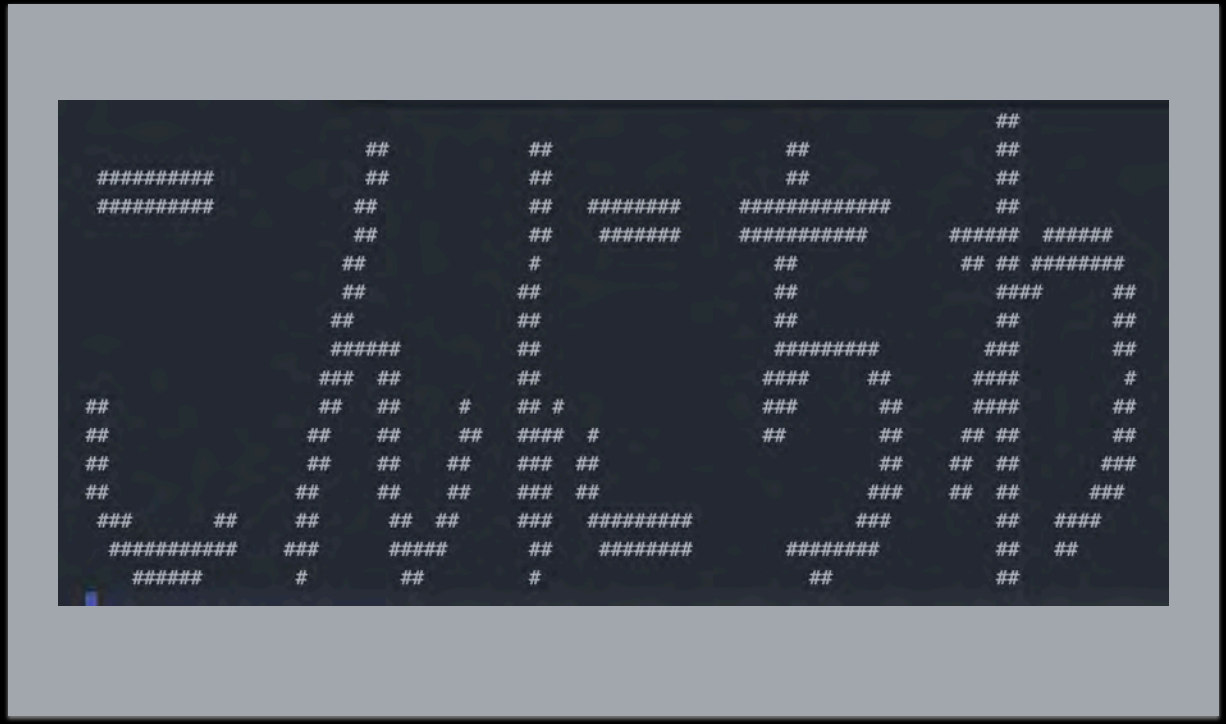
“文字”
characters in cyberspace

1980年代

Ohayo Gozaimasu

Kyou no kaigi ha, nanji desuka?

1980年代



日本語でメール!　多国語化の始まり

Network Working Group
Request for Comments: 1468

J. Murai
Keio University
M. Crispin
Panda Programming
E. van der Poel
June 1993

Japanese Character Encoding for Internet Messages

Status of this Memo

This memo provides information for the Internet community. It does not specify an Internet standard. Distribution of this memo is unlimited.

Introduction

This document describes the encoding used in electronic mail [RFC822] and network news [RFC1036] messages in several Japanese networks. It was first specified by and used in JUNET [JUNET]. The encoding is now also widely used in Japanese IP communities.

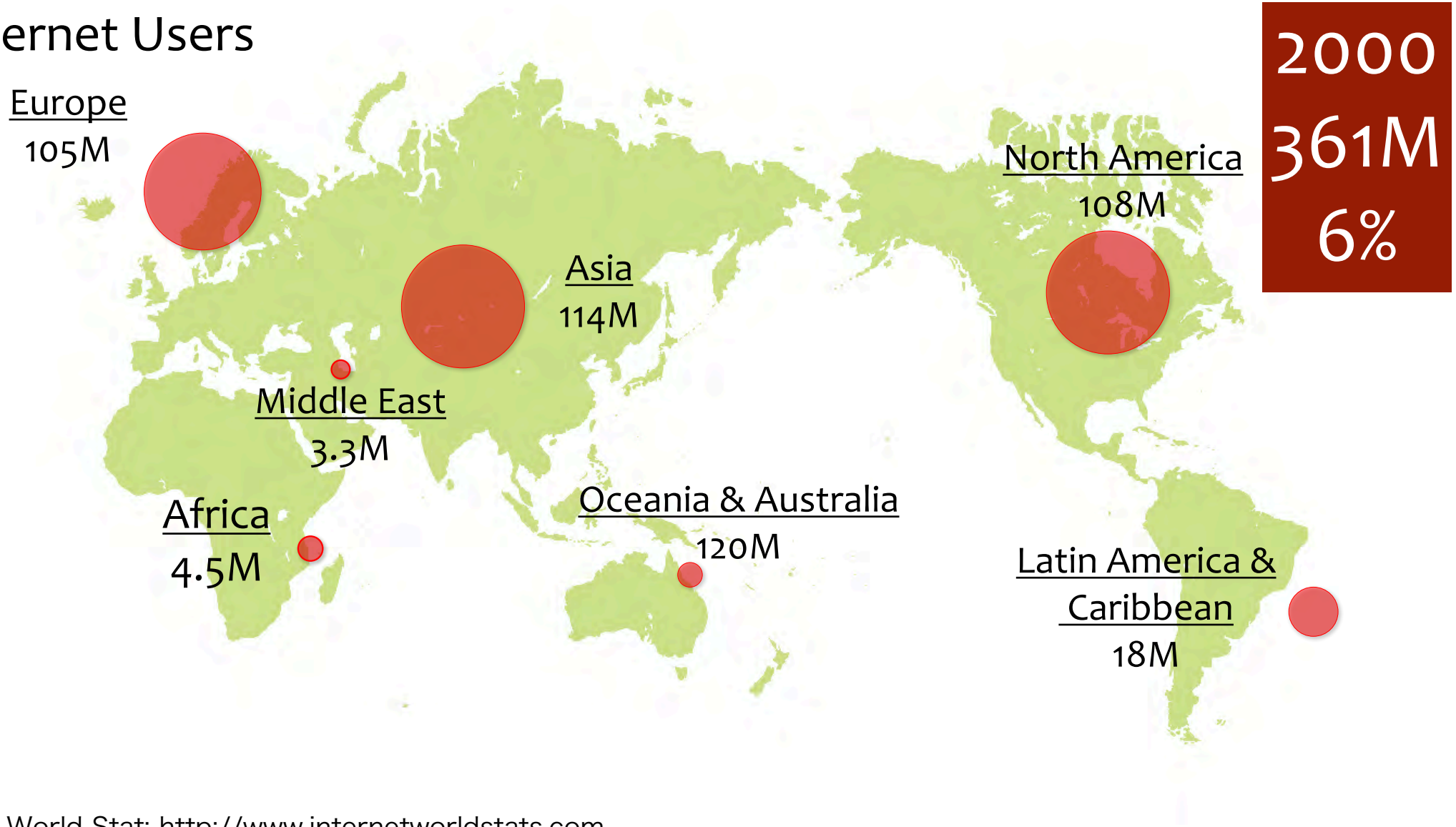
The name given to this encoding is "ISO-2022-JP", which is intended to be used in the "charset" parameter field of MIME headers (see [MIME1] and [MIME2]).

1990年代〜

おはようございます。

今日の会議は何時ですか?

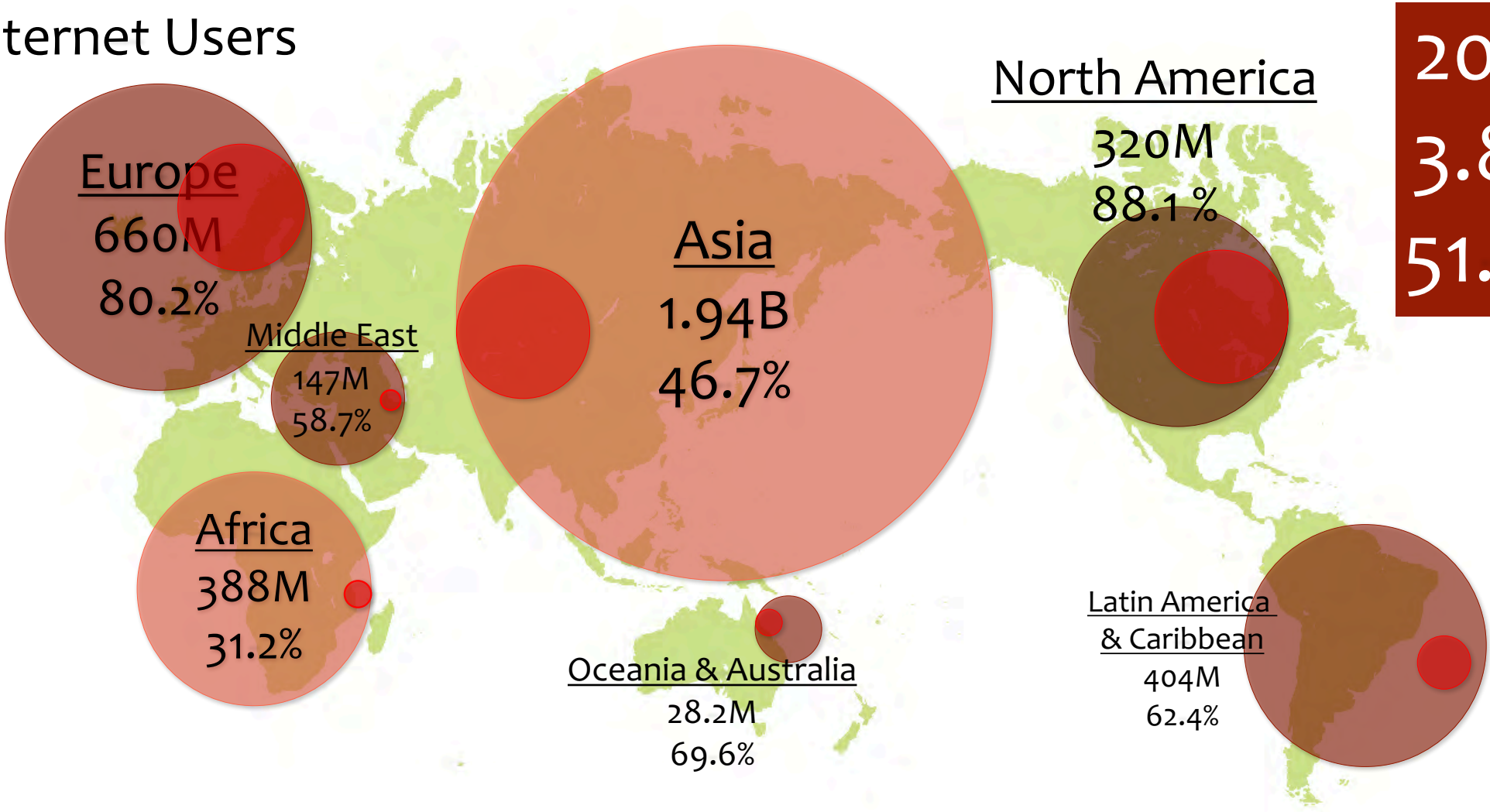
Internet Users



2000
361M
6%

nternet World Stat: http://www.internetworldstats.com

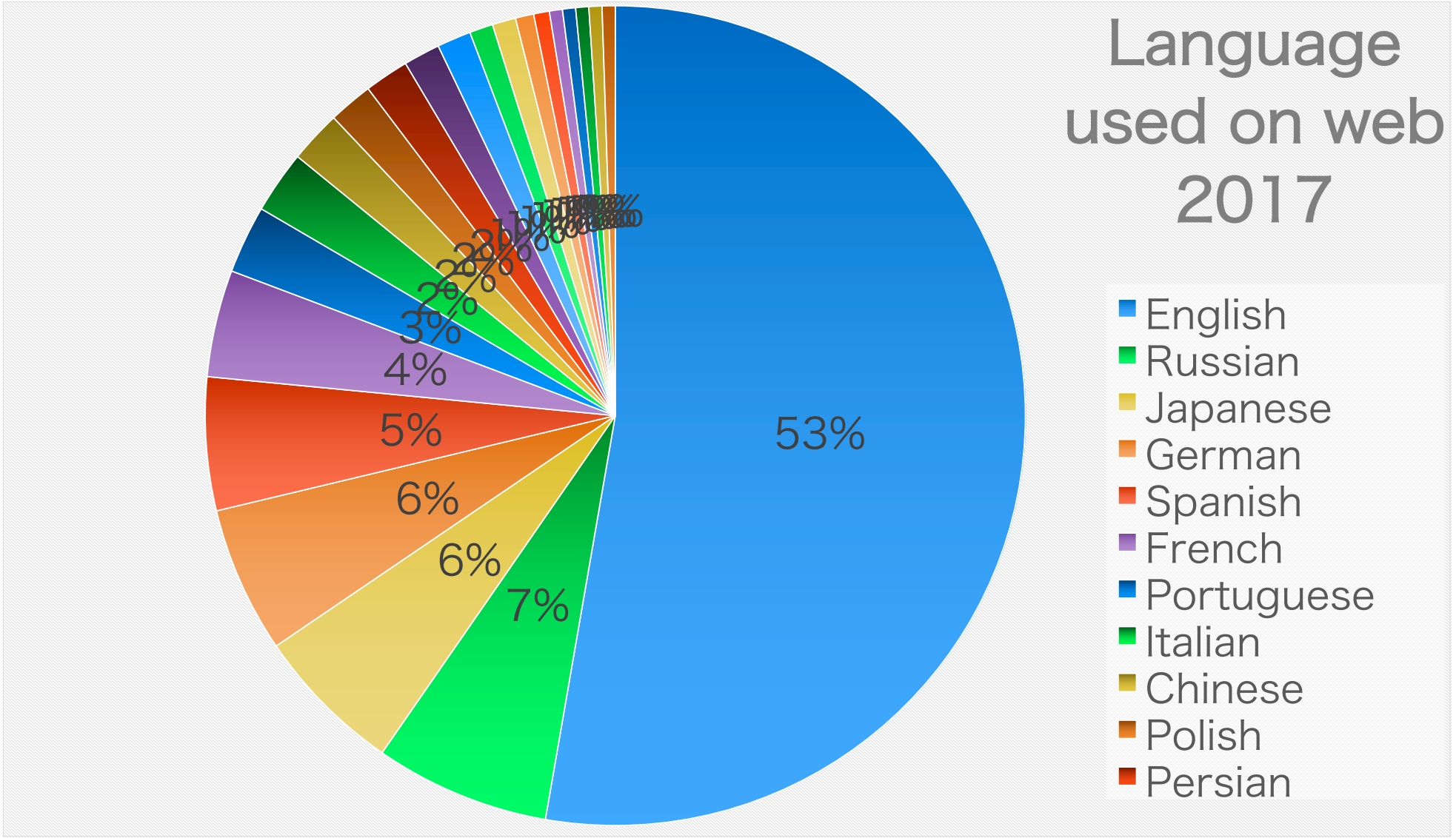
Internet Users

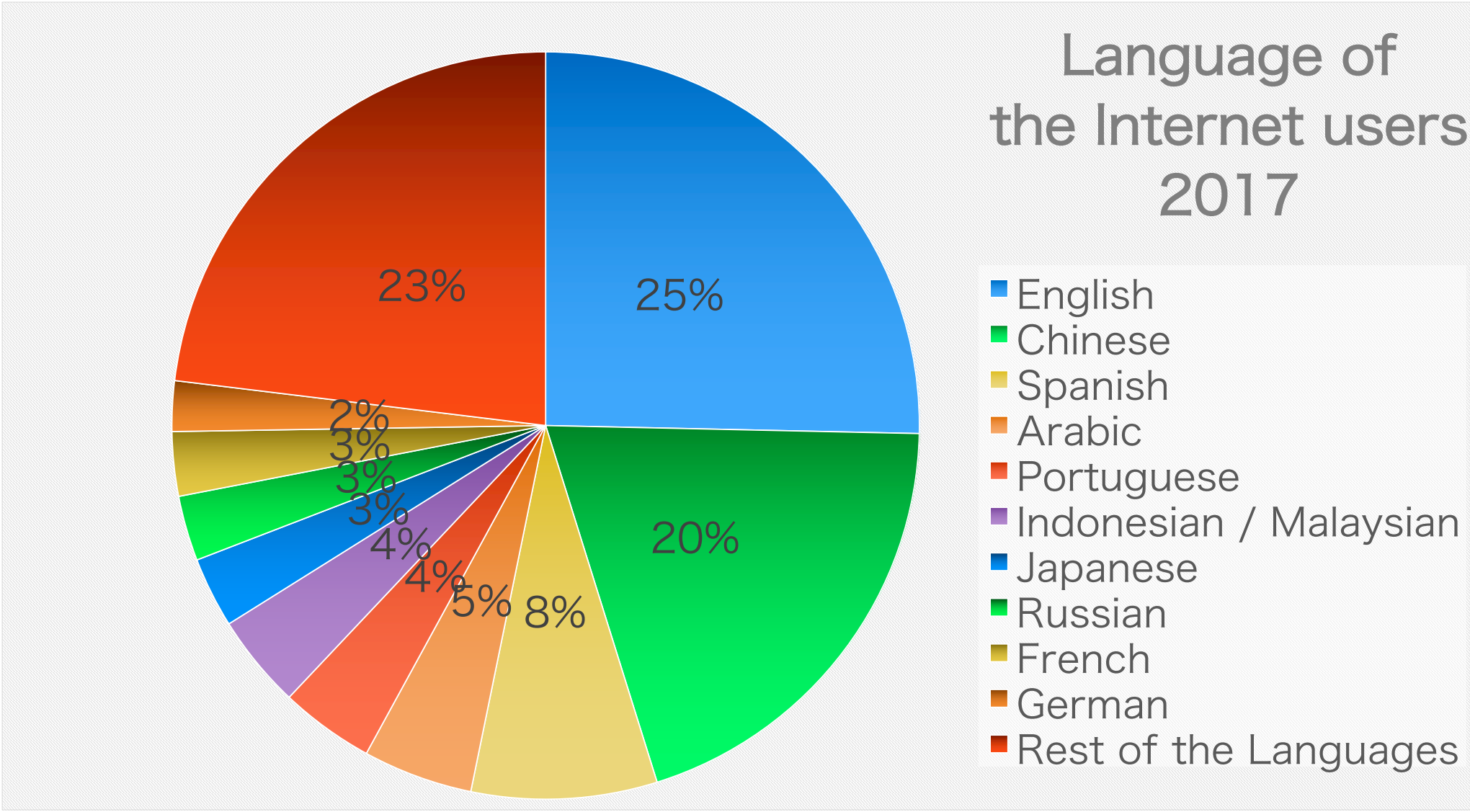


2017
3.8B
51.7%

Penetration (% population)

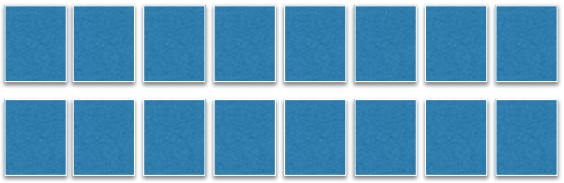
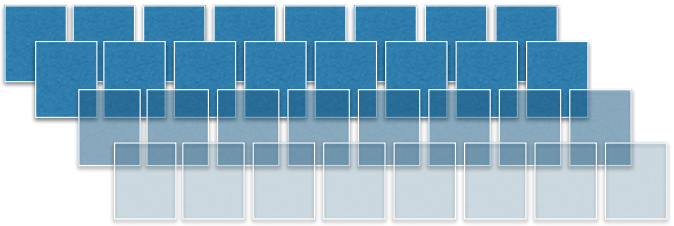
Internet World Stat:
http://www.internetworldstats.com ,June 30, 2017


Language used on web 2017
53%
7%
6%
6%
5%
4%
3%
2%
English
Russian
Japanese
German
Spanish
French
Portuguese
Italian
Chinese
Polish
Persian


Language of the Internet users 2017
25%
20%
8%
5%
4%
4%
3%
3%
3%
2%
23%
English
Chinese
Spanish
Arabic
Portuguese
Indonesian / Malaysian
Japanese
Russian
French
German
Rest of the Languages

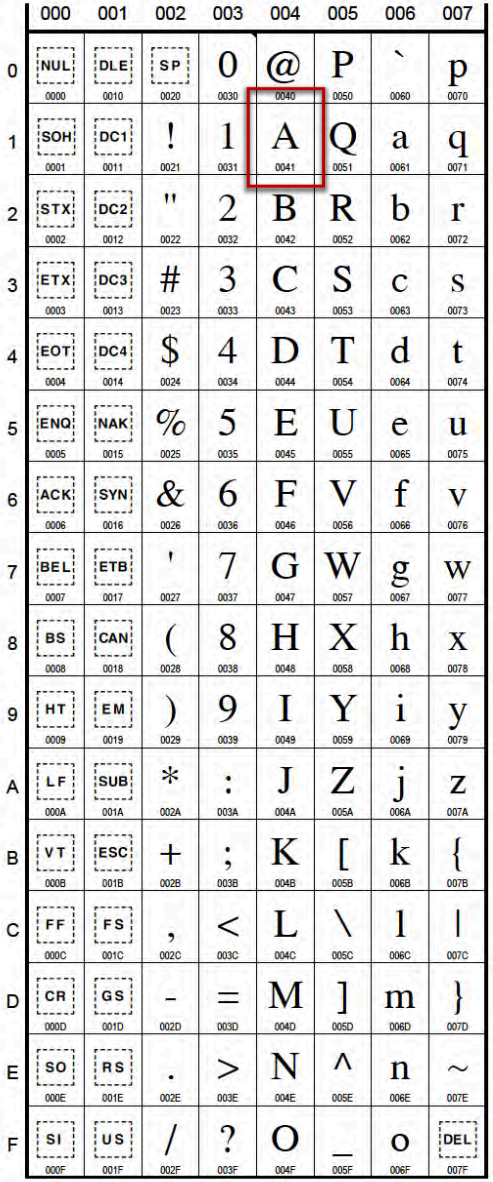
7 → 8 → 16 → more

世界中のシステムの国際化

7bit		0〜127	ACSII only “A” = x41 = 65
8bit		0〜255	Latin-1 “À” = xC0 = 192
16bit = 2バイト		256x256 about 65,000	Kanji/Kana & many mores
more bits more bytes		More and more	++ Much more others

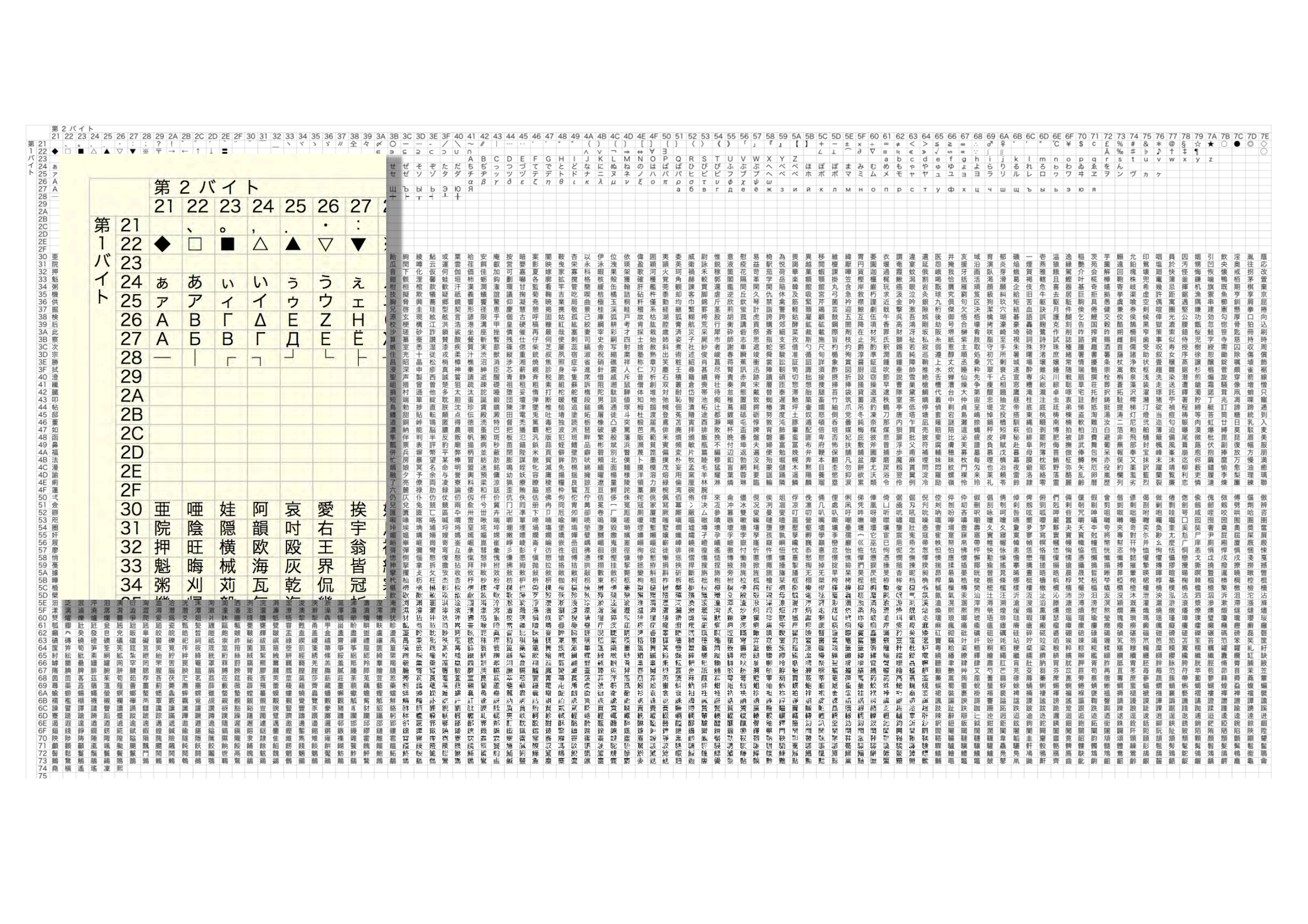
7bit ASCII

8bit Latin-1



	000	001	002	003	004	005	006	007
0	NUL 0000	DLE 0010	SP 0020	0 0030	@ 0040	P 0050	` 0060	p 0070
1	SOH 0001	DC1 0011	! 0021	1 0031	A 0041	Q 0051	a 0061	q 0071
2	STX 0002	DC2 0012	" 0022	2 0032	B 0042	R 0052	b 0062	r 0072
3	ETX 0003	DC3 0013	# 0023	3 0033	C 0043	S 0053	c 0063	s 0073
4	EOT 0004	DC4 0014	$ 0024	4 0034	D 0044	T 0054	d 0064	t 0074
5	ENQ 0005	NAK 0015	% 0025	5 0035	E 0045	U 0055	e 0065	u 0075
6	ACK 0006	SYN 0016	& 0026	6 0036	F 0046	V 0056	f 0066	v 0076
7	BEL 0007	ETB 0017	' 0027	7 0037	G 0047	W 0057	g 0067	w 0077
8	BS 0008	CAN 0018	(0028	8 0038	H 0048	X 0058	h 0068	x 0078
9	HT 0009	EM 0019	) 0029	9 0039	I 0049	Y 0059	i 0069	y 0079
A	LF 000A	SUB 001A	* 002A	: 003A	J 004A	Z 005A	j 006A	z 007A
B	VT 000B	ESC 001B	+ 002B	; 003B	K 004B	[005B	k 006B	{ 007B
C	FF 000C	FS 001C	, 002C	< 003C	L 004C	\ 005C	l 006C	| 007C
D	CR 000D	GS 001D	- 002D	= 003D	M 004D	] 005D	m 006D	} 007D
E	SO 000E	RS 001E	. 002E	> 003E	N 004E	^ 005E	n 006E	~ 007E
F	SI 000F	US 001F	/ 002F	? 003F	O 004F	_ 005F	o 006F	DEL 007F

	008	009	00A	00B	00C	00D	00E	00F
0	XXX 0080	DCS 0090	NB SP 00A0	° 00B0	À 00C0	Ð 00D0	à 00E0	ð 00F0
1	XXX 0081	PU1 0091	¡ 00A1	± 00B1	Á 00C1	Ñ 00D1	á 00E1	ñ 00F1
2	BPH 0082	PU2 0092	¢ 00A2	2 00B2	Â 00C2	Ò 00D2	â 00E2	ò 00F2
3	NBH 0083	STS 0093	£ 00A3	3 00B3	Ã 00C3	Ó 00D3	ã 00E3	ó 00F3
4	IND 0084	CCH 0094	¤ 00A4	´ 00B4	Ä 00C4	Ô 00D4	ä 00E4	ô 00F4
5	NEL 0085	MW 0095	¥ 00A5	µ 00B5	Å 00C5	Õ 00D5	å 00E5	õ 00F5
6	SSA 0086	SPA 0096	¦ 00A6	¶ 00B6	Æ 00C6	Ö 00D6	æ 00E6	ö 00F6
7	ESA 0087	EPA 0097	§ 00A7	· 00B7	Ç 00C7	× 00D7	ç 00E7	÷ 00F7
8	HTS 0088	SOS 0098	¨ 00A8	¸ 00B8	È 00C8	Ø 00D8	è 00E8	ø 00F8
9	HTJ 0089	XXX 0099	© 00A9	1 00B9	É 00C9	Ù 00D9	é 00E9	ù 00F9
A	VTS 008A	SCI 009A	ª 00AA	º 00BA	Ê 00CA	Ú 00DA	ê 00EA	ú 00FA
B	PLD 008B	CSI 009B	« 00AB	» 00BB	Ë 00CB	Û 00DB	ë 00EB	û 00FB
C	PLU 008C	ST 009C	¬ 00AC	¼ 00BC	Ì 00CC	Ü 00DC	ì 00EC	ü 00FC
D	RI 008D	OSC 009D	SHY 00AD	½ 00BD	Í 00CD	Ý 00DD	í 00ED	ý 00FD
E	SS2 008E	PM 009E	® 00AE	¾ 00BE	Î 00CE	Þ 00DE	î 00EE	þ 00FE
F	SS3 008F	APC 009F	¯ 00AF	¿ 00BF	Ï 00CF	ß 00DF	ï 00EF	ÿ 00FF



文字と文字コード

- JIS X 0208, JIS X 0212, JIS X 0221, or JIS X 0213
- GB (Simplified Chinese)
- Big5　（Traditional Chinese）

などなど世界「各国」で標準化が進んでいったが・・・
多国語対応どうするの？

国ごとの調整

↓

グローバルな調整

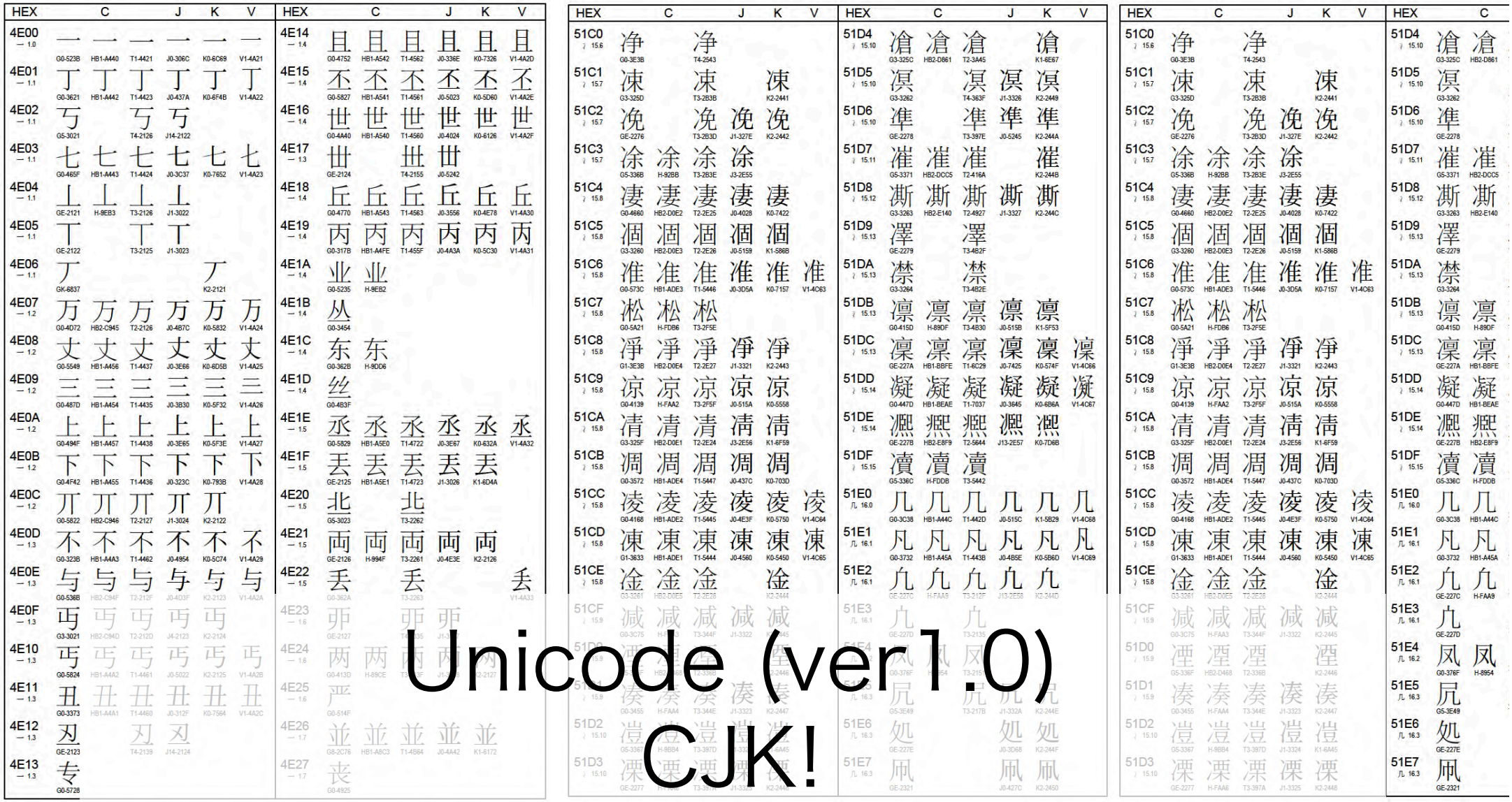
国内標準 >> 国際標準:ISO >>>> グローバル標準:UNICODE

Unicode

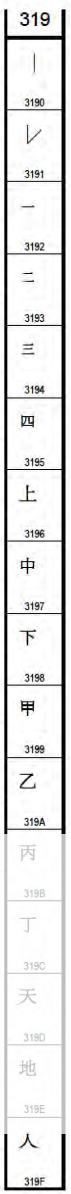
covers all the characters for all the writing systems of the world, modern and ancient.

1993(ver1.0) ~ 2017(ver10.0)

21bits code space= 可能な文字数：約210,000

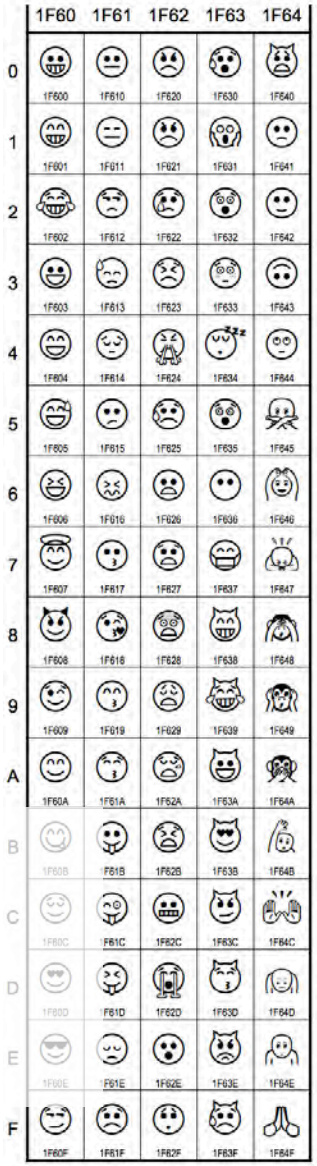


Unicode (ver1.0) CJK!



Unicode

変体仮名
訓点
絵文字
まで



2000年代〜

```
おはようございます。
谢谢
```

```
0000000  お ** ** は ** ** よ ** ** う ** ** ご ** ** ざ
         81e3   e38a   af81   82e3   e388   8681   81e3   e394

0000020  ** ** い ** ** ま ** ** す ** ** 。 ** ** ¥n 谢
         9681   81e3   e384   be81   81e3   e399   8280   e80a

0000040  ** ** 谢 ** ** ¥n
         a2b0   b0e8   0aa2
```

Unicode

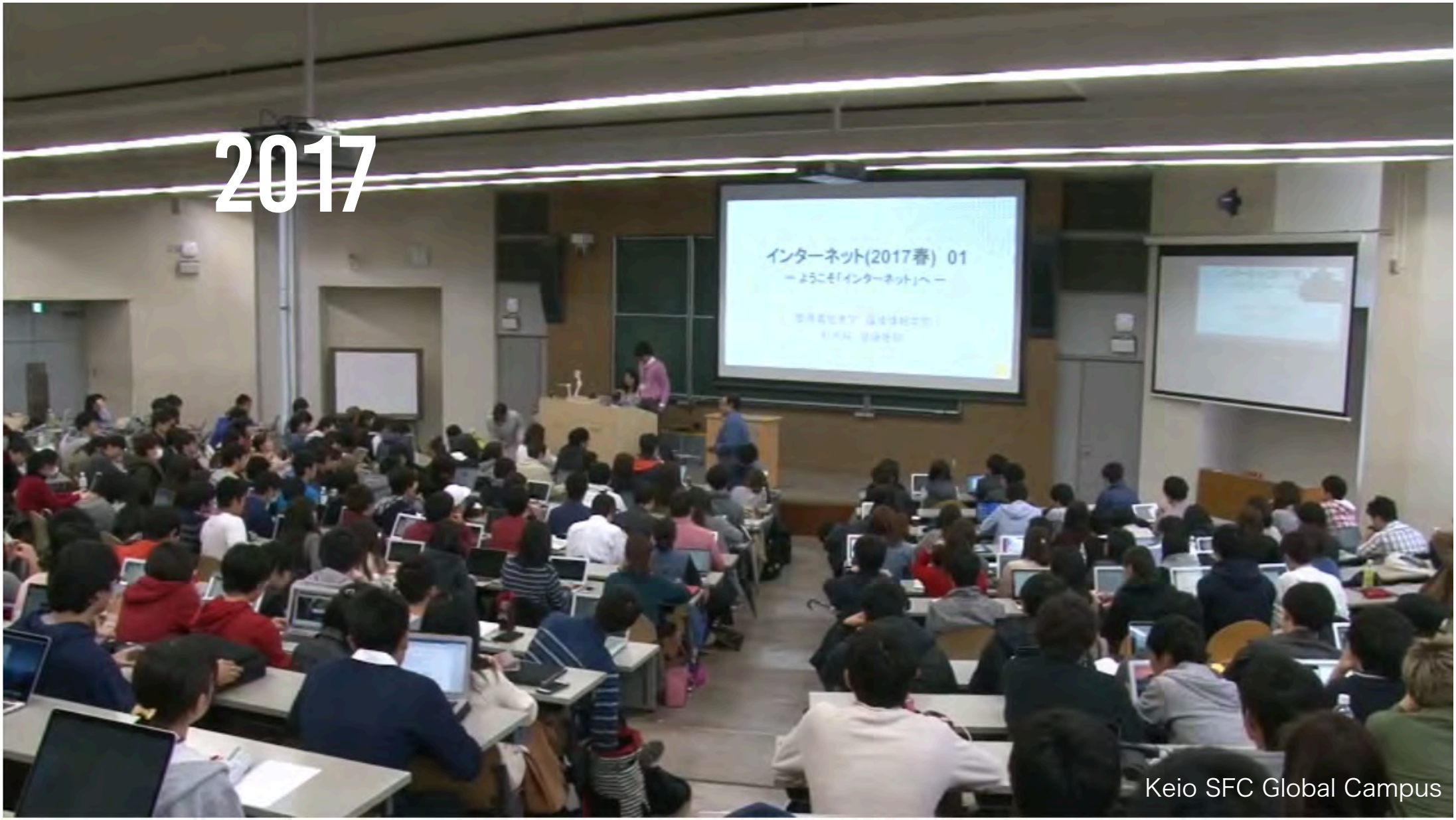
covers all the characters for all the writing systems of the world, modern and ancient.

1993(ver1.0) ~ 2017(ver10.0)

21bits code space= 可能な文字数：約210,000

Future
Learn

1898
94
From Wikipedia


2017
インターネット(2017春) 01
ーようこそ「インターネット」へー
Keio SFC Global Campus

MOOC

Massive Open Online Course

440,000 Joiners!

BBC Sign in | News | Sport | Weather | iPlayer | TV | Radio

NEWS

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Education | School Report

UK 'biggest online university course'

By Sean Coughlan
Education correspondent

13 May 2015 | Education & Family

THE TIMES HIGHER EDUCATION WORLD UNIVERSITY RANKINGS

HOME | NEWS | COMMENT | FEATURES | BOOKS | RANKINGS | AWARDS | JOBS

HOME › 'BIGGEST-EVER MOOC' STARTS ON FUTURELEARN

'Biggest-ever Mooc' starts on FutureLearn

FutureLearn, the UK massive open online course platform, has this week commenced what it believes is the biggest-ever Mooc.

MAY 15 2015

BY CHRIS PARR
FOLLOW AUTHOR ON CHRISPARRTHE

2014

gacco
The Japan mooc

Certified by
JMOOC

2006

2012

edX

2012

coursera

2012

2012

Open Educational Resource

オープンな教育資源

- パブリックドメインあるいは無料で再構成を含む利用が許可された教育目的（学ぶ、教える、研究する）の資源

- 授業、授業資料、学習モジュール、教科書、ビデオ、テスト、ソフトウェア、ツール、素材等、形にとらわれず、「知識」へのアクセスを支援するためのあらゆる資源

- 2002年7月 UNESCOの会議@パリの最終レポートで定義が登場
  “Forum on the Impact of Open Courseware for Higher Education in Developing Countries”

Open Educational

オープンな教育

- 知識や知見は皆で共有すべき、という考え方。
- 共有すること・分かち合うとことは、”Education”の最も基本とするところだろう。
- “Education”とは、知識、発見したこと、持っている情報などを、他人と分かち合うこと。それを通して、さらに新しい知識、スキル、アイディア、理解が構築されるのだ！
- テクノロジが可能にしてくれた!

http://www.oeconsortium.org/

Social Learning

ソーシャルラーニング

- 例えば….
  - ピアが学ぶ様子を見ながら学ぶ
  - ピアから知識を得る
  - ピアに教えながら学ぶ
  - 知識・アイディア・情報を共有する
  - 会話を通して学ぶ
  - メンターが明示的に会話を誘導
  - 共に造る
  - より深く理解している人たちとの会話をとおして学ぶ

Future
Learn

LEARNING DESIGN @ FL

STORYTELLING

PROVOKING CONVERSATIONS

CELEBRATING PROGRESS

SOCIAL LEARNING BIG QUESTION & SMALL STEPS

歴史は誰のもの？

Who owns the history?

なぜ我々は
年をとるのか？

Why do we age?

気候変動は
どうやったら見える？

How do we watch climate change happen?

あなたにとって
自由とは何か?

What does freedom mean to you?

心とは何か？

What is a mind?

STEPS IN 10 MINUTES

Article

Video/Audio

Discussion

Quiz

Test

Exercise

Our first FutureLearn Course

Japanese Culture Through Rare Books

Keio University

The Course Outline

WEEK 1:
THE RELATIONSHIP BETWEEN VISUAL APPEARANCE AND CONTENT IN JAPANESE BOOKS
17 steps (11 video steps)

WEEK 2:
MANUSCRIPTS AND ILLUSTRATED VERSIONS OF THE JAPANESE CLASSICS
19 steps (11 video steps)

WEEK 3:
SCHOLARSHIP AND PUBLISHING IN THE EDO PERIOD
19 steps (8 video steps)

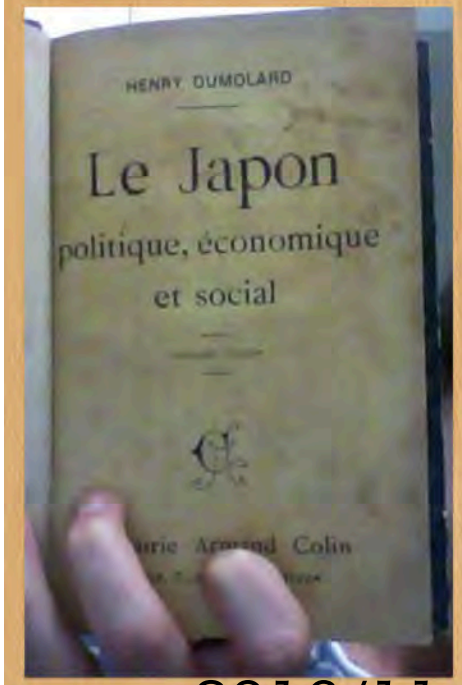
2016/11/24

Week1 Starting Activity

What is the oldest book in your house?

Share your photo and story on **padlet**

A colection of literature classics. From "One Thousand and One Nights" to "War and Peace", this colection of Vergara Editors came to my hands almost 9 years ago. They were from my Grandfather and my grandmother allowed me to keep them. They date from 1935 and were printed in Barcelona, Spain. In them I have not only found marvellous histories but also a strong bond and admiration towards my grandfather.



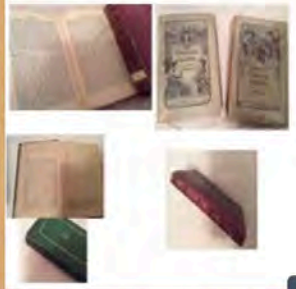
British Samurai.

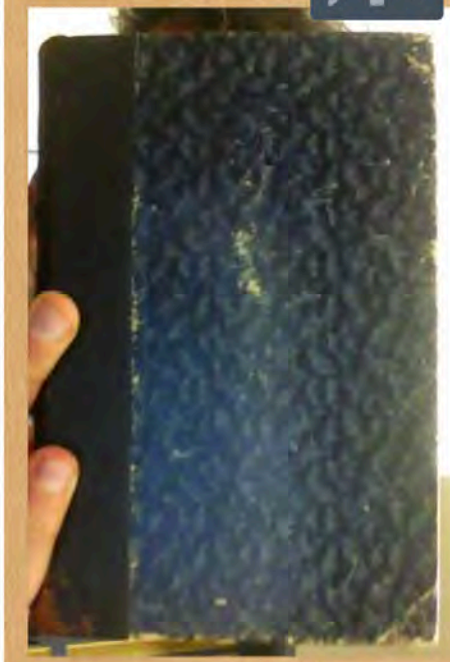
I do not own many books that you would class as 'old' because since my move to Japan I have left most of my reading material at home, in the UK.

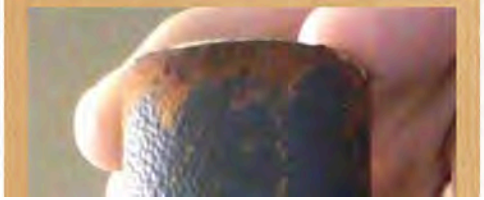
I do have this book though, it's called 'SAMURAI WILLIAM - The Adventurer Who Unlocked Japan' written by Giles Milton.
It is roughly four hundred pages long and being published in 2002 it uses a more modern style of binding, which you will see in many modern books. The binding and type face have no special techniques behind them so there are no real unique features with this book, apart from the discoloration of the pages and the history behind the story.

The story itself is highly recommendable. It is set in the 1600's

hidden treasures within.







2

British Samurai

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The story itself is highly recommendable. It is set in the 16 and it is based on the real life accounts of William Adams, an English mariner that goes on a v and ends up becoming a native Japan. As he is one of only a hand

2016/11/24

https://padlet-uploads.s3.amazonaws.com/prod/122039442/f73cc4cb5e08a7062a76d1d117df7a59c9746f21/f1071ca5cad779ed66b8d8f1be06f417.jpg

Week3 Starting Activity

What it shows?

この絵は何だと思う？　ここから
日本の文化について思ったことを
コメントしてみてください。

What do you see in this picture?

What kind of story about Japanese culture can you tell from this picture?

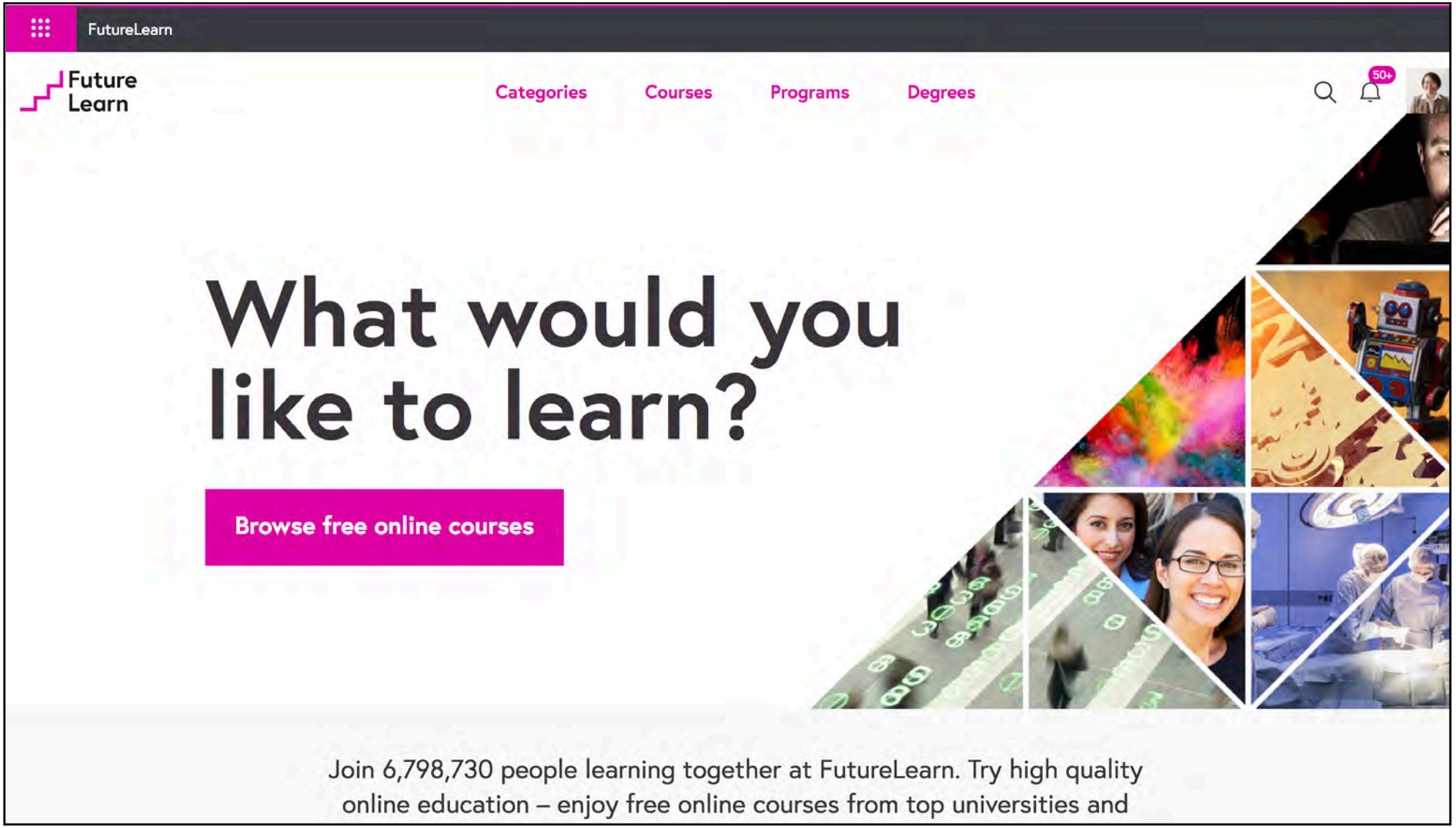
2016/11/24

Quiz！

- 「紫式部は地獄に落ちた」と書かれている書物があります。

- その書物の著者はなぜそんなことをいったのでしょうか？

https://www.futurelearn.com/



Tells stories – every course should tell a story, this should include a clear structure and taking the learner on a journey of exploration.

Provokes conversation – We want one that gets people talking. We're firm believers in social learning and we have over 50 years of experience, thanks to the UK's Open University.

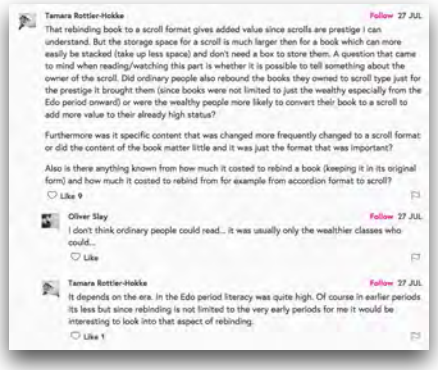
Celebrates progress – throughout every course there should be moments for celebration so learners can feel proud of their progress.

Strategy

Methodology: Visible Learning

Structure: Linear (simplified learning activities)

Contents: Videos, Articles, Quizes, and Discussion Board



Keio FutureLearn Courses

As of September 29, 2017

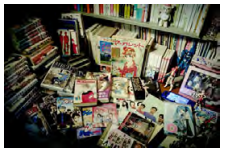
1

Japanese Culture Through Rare Books

Explore the important roles that books have played in the cultural history of Japan.

- Run1- July 18, 2016
- Run2- Jan 9, Run3-May 22, 2017
- Run4- Sep 25

2

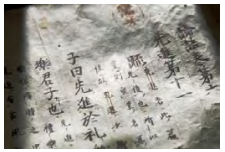


An Introduction to Japanese Subcultures

Explore Japanese subcultures and learn about their history from the 1970s to today.

- Run1 - Nov 28, 2016
- Run2 - April 17, 2017
- Run3 - Oct, 2017 (plan)

3



Sino-Japanese Interactions Through Rare Books

Learn about the role of books in the relationship between the cultures of Japan and China, with this free online course.

- Run1 - Aug 21, 2017

4

Unterstanding Quantum Computers

Explore the key concepts of quantum computing and find out how it's changing computer science with this introductory course.

- Run1 - Oct 2, 2017 (on going)

Course Details (1)

Japanese Culture Through Rare Books

July 18, 2016

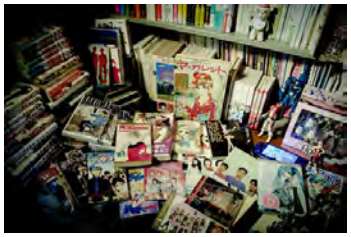
Week 1	THE RELATIONSHIP BETWEEN VISUAL APPEARANCE AND CONTENT IN JAPANESE BOOKS
Week 2	MANUSCRIPTS AND ILLUSTRATED VERSIONS OF THE JAPANESE CLASSICS
Week 3	SCHOLARSHIP AND PUBLISHING IN THE EDO PERIOD

Summary	Learning Japanese culture focusing on Japanese Book binding, style, history
Faculty	Prof. Sasaki & Prof. Ichinohe Institute of Oriental Classis
Learning hours	3 hours x 3 weeks
Course content	55 Steps (A14,V30,Q4,D6)
Special note	159 books (665images) are accessible. Many librarians in the world are taking this course.
First Qustion	What is the oldest book in your house? (photos and story)

A:Article, V:Video, Q:Quiz, D:Discussion, E:Exercise

An Introduction to Japanese Subcultures

Nov 28, 2016



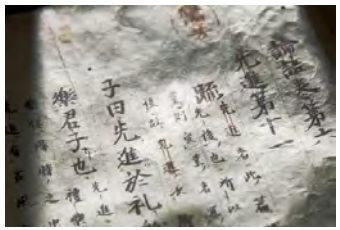
Week 1	LOVE
Week 2	BATTLE
Week 3	TECHNOLOGY
Week 4	FAN CULTURE

Summary	Learning Japanese youth culture focus on 70's subcultures such as Manga, Anime, Music
Faculty	Prof. Ogushi, Prof. Takahashi,, Prof. Niijima and Prof. Ohwada (Faculty of Letters, Economics , Law)
Learning hours	4 hours x 4 weeks
Course content	80 Steps (A38,V21,Q2,D19)
Special note	Deep insight and academic discussion about youth culture from the view point of "Vulnerability" and "immaturity".
First Question	What is your favorite Japanese subculture?

Course Details (2)

Sino-Japanese Interaction Through Rare Books

Aug 21, 2017



Week 1	Early History of Printing and book Culture in Japan
Week 2	The Analects of Confucius
Week 3	Books on Chinese Studies - Recomposition and creation in medieval Zen temples
Week 4	Books in Chinese Studies - from medieval to early modern Japan

Summary	Learning how continent culture influenced to Japan, by looking into Chinese classics in Japan.
Faculty	Prof. Horikawa, Prof. Sumiyoshi (Institute of Oriental Classics) and Prof. Takahashi (Faculty of letters)
Learning hours	3 hours x 4 weeks
Course content	65 Steps (A29,V29,Q1,D6)
Special note	101 books (219 image) are available to the learners. More expert users and Japanese are taking courses
First Question	What is your foreign books in your house? (photos and story)

A:Article, V:Video, Q:Quiz, D:Discussion, E:Exercise

Understanding Quantum Computers

Oct 2, 2017 (on going)

Week 1	Quantum Computing Concepts
Week 2	Quantum Algorithms
Week 3	Quantum Hardware and Industry

Summary	Learning basic concept and industry trend
Faculty	ロドニー・バンミータ（環境情報学部） 佐藤　貴彦（政策・メディア研究科）
Learning hours	4 hours x 3 weeks
	74 Steps (A36, V21, Q9, D8, E4)
Special note	High school students are main target.Easy introduction including Laboratory visit vides.
First Question	Where did you first hear about quantum computers?

Finding Interference in the Real World

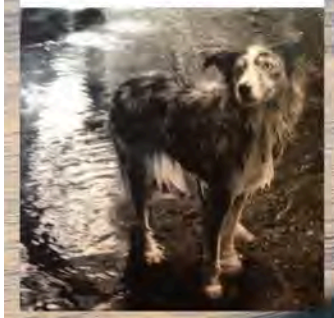
KEIO FUTURELEARN +18 2

Finding Interference in the Real World

If you know what you're looking for, you'll often see evidence of interference in the real world. It might be light, or sound, or waves in a pond or the ocean. Find an example, and post a photo or video here. Describe what you found.

Dog waves

Our dog sets off multiple waves that interfere with the water.
She also interferes with the water.



Chladni Plate Experiment

saw this experiment last week! Not really daily life, but I thought it was cool. The grains settle where the waves interfere so that there is zero displacement (the nodes), and so at the plate's resonance frequencies, a standing wave forms! And you get cool patterns!

Gravitational waves

Tides are impelled mostly by the gravitational effect from the moon. The sun (much further away) has lesser effect. When they align during full moon or new moon, the gravity pull is increased and gives us larger amplitude tides.

Lots of interference here at the Falls of Lora in Argyll, Scotland

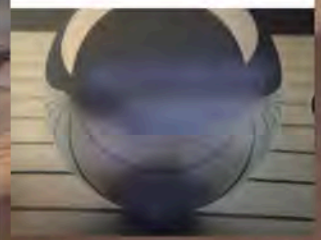
Holograms

A hologram itself is unintelligible when viewed under diffuse ambient light. It is an interference pattern. When lit with laser light, the interference pattern diffracts the light into a 3D image.

Lots of interference at the Falls of Lora in Argyll

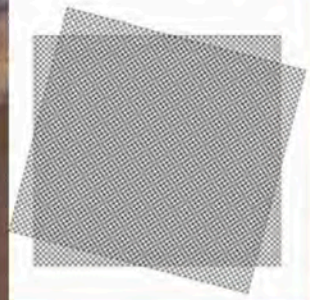
amused mind interference

this is the record cover for TOMMY by The Who, it was just next to where i'm sitting...makes me think about interference in several ways, perhaps mistaken if considered solely in a physics context... despite my ignorance in the subject, quantum physics seem to me similar to this image, like fitting into perspectives depending on general consensus, as if 'collective unconscious' reflected upon itself.



Moire interference.

There is term of "moire" in polygraphy, which is formed by interference of two or more regular structures. And this moire creates new regular structure. As polygraphic raster supposed to be obscure these new regular structures are more visible and it's typically considered as a defect



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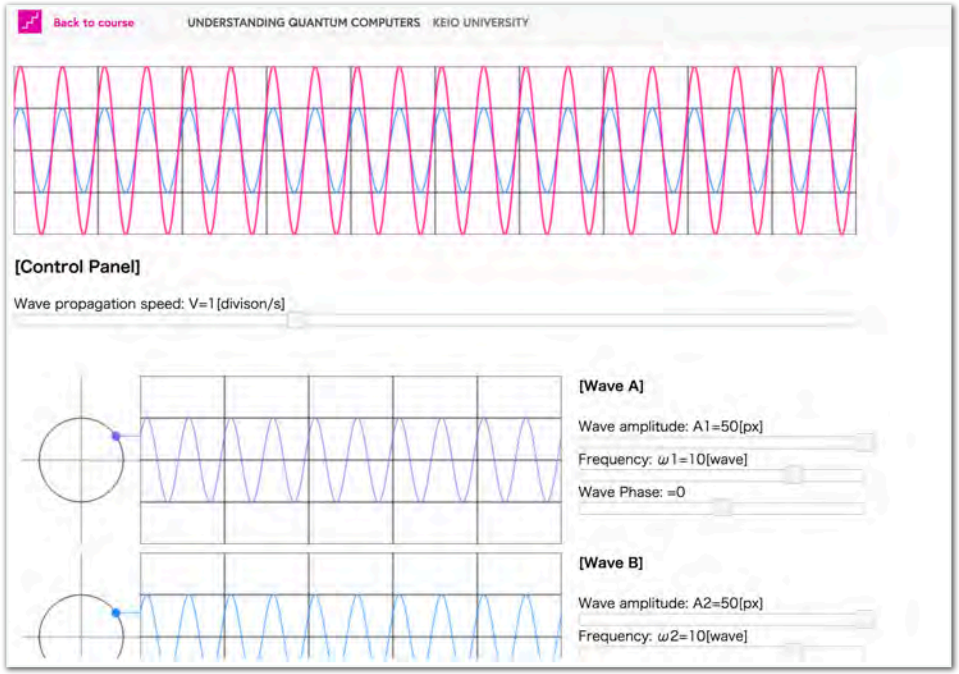
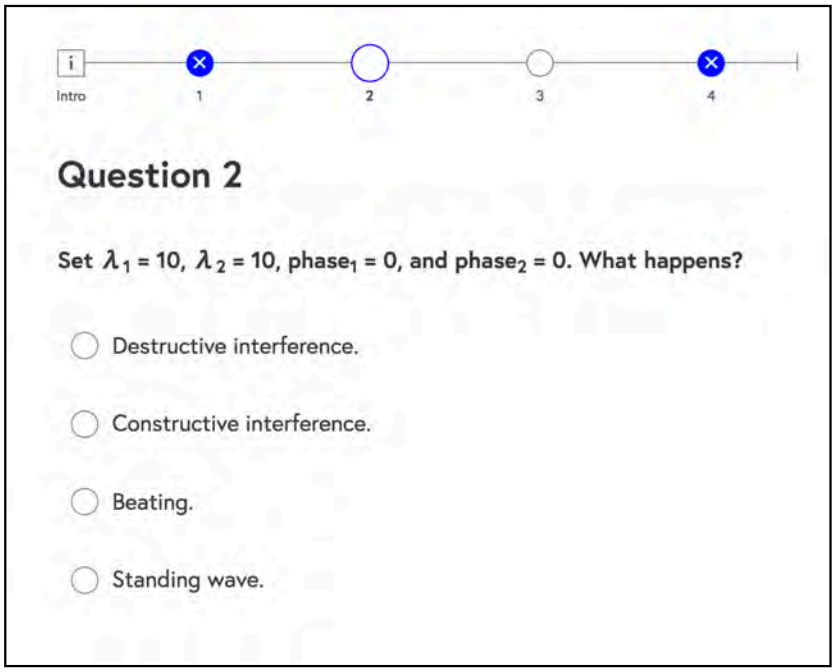
Litter bin

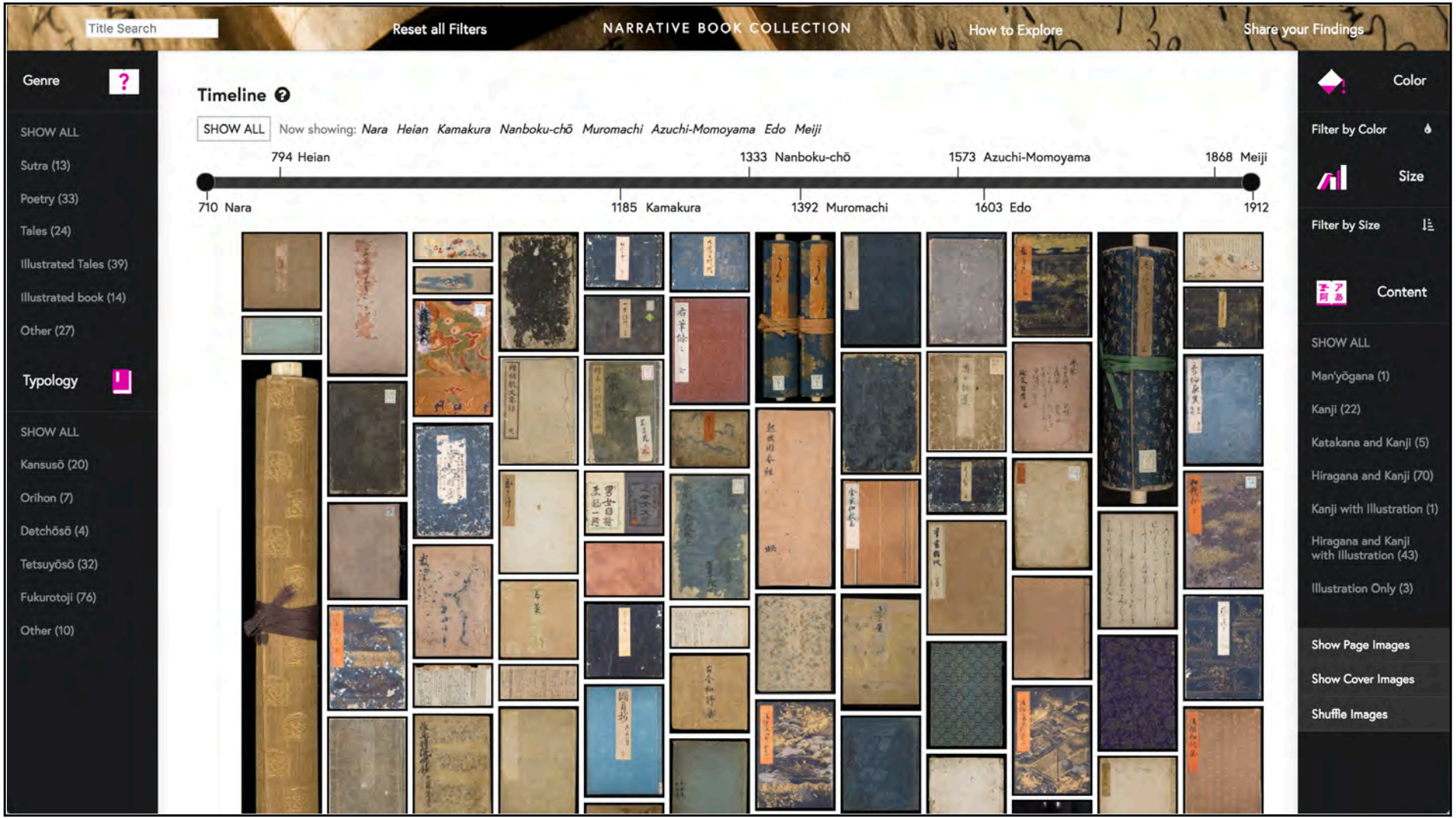
The interference in my litter bin gives

.

Exercise & Quiz : How interference behaves






Title Search
Reset all Filters
NARRATIVE BOOK COLLECTION
How to Explore
Share your Findings
Genre
SHOW ALL
Sutra (13)
Poetry (33)
Tales (24)
Illustrated Tales (39)
Illustrated book (14)
Other (27)
Typology
SHOW ALL
Kansusō (20)
Orihon (7)
Detchōsō (4)
Tetsuyōsō (32)
Fukurotoji (76)
Other (10)
Timeline
SHOW ALL
Now showing: Nara Heian Kamakura Nanboku-chō Muromachi Azuchi-Momoyama Edo Meiji
794 Heian
1333 Nanboku-chō
1573 Azuchi-Momoyama
1868 Meiji
710 Nara
1185 Kamakura
1392 Muromachi
1603 Edo
1912
Color
Filter by Color
Size
Filter by Size
Content
SHOW ALL
Man'yōgana (1)
Kanji (22)
Katakana and Kanji (5)
Hiragana and Kanji (70)
Kanji with Illustration (1)
Hiragana and Kanji with Illustration (43)
Illustration Only (3)
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Zoom

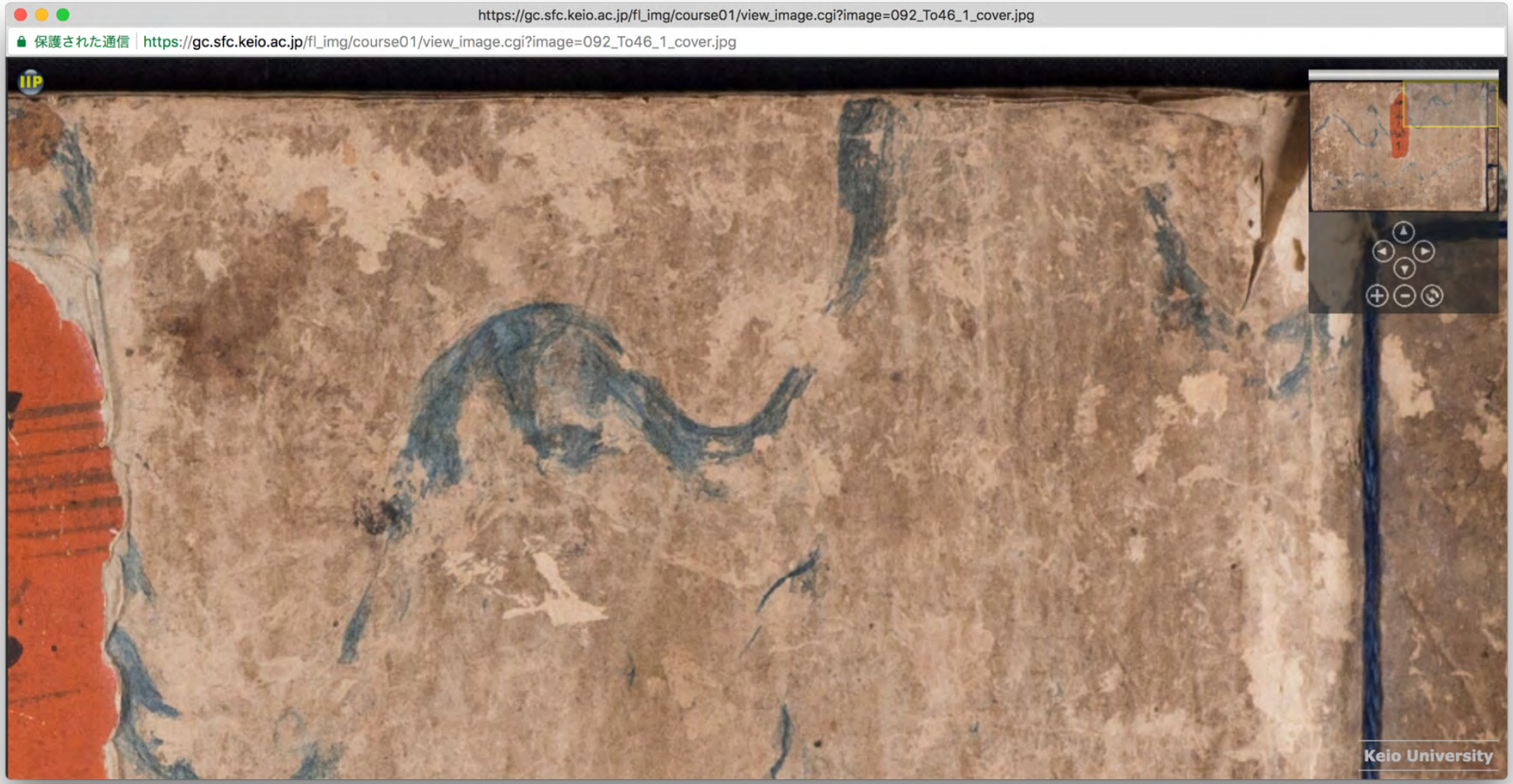
Giō

祇王 ぎおう

祇王 〔江戸初期〕
慶應義塾図書館

Imprint:	early Edo period
Description:	Starting from the 16th century, it became common to insert illustrations in book-style formats, such as Fukurotoji. "Gio" is a illustrated tale of female tragedy (considered as a part of 13th century Heike Monogatari). Bound in horizontal fukurotoji (yokohon) format, this book is slightly larger (25.6 x 18.5 cm) comparing with other illustrated books.
FutureLearn:	Japaense Culture Through Rare Books 2.15
Created/Published	The first half of 17th Century
Genre:	Illustrated Tales
Color:	#6A5B42 #8C7554 #9C562A #A08866 #CDC0AD
Size	Yokohon (Height 18.5cm × Width 25.6cm)
Binding Style:	Fukurotoji
Scripts/Fonts:	Hiragana and Kanji with Illustration
Source:	Keio University Library 110X@409@2

Keio Univeristy Media Center(Library) | KEIO Institute of Oriental Classics (Shido Bunko) | Image Use Policy


https://gc.sfc.keio.ac.jp/fl_img/course01/view_image.cgi?image=092_To46_1_cover.jpg
保護された通信
https://gc.sfc.keio.ac.jp/fl_img/course01/view_image.cgi?image=092_To46_1_cover.jpg
IIP
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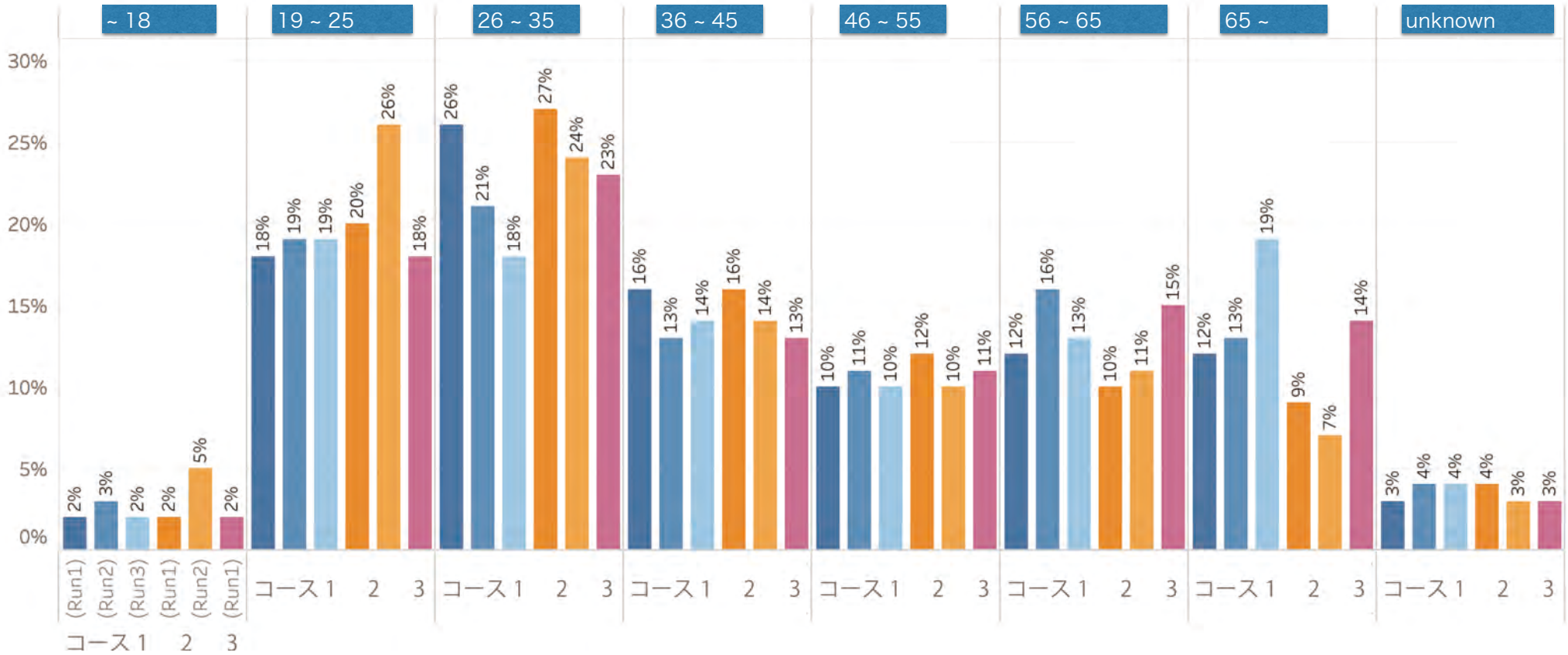
Course Measures

Numbers

	Book1 (1)	Book1 (2)	Book1 (3)	Subculture (1)	Subculture (2)	Book2	Quantum
Joiner 登録者	8,667	5,620	1,355	9,859	3,383	4,025	1,854
Leaners 受講者	4,195 49,4%	2,646 47.1%	1,355 60.8%	4,841 49,1%	1,837 55.0%	1,656 41.1%	1,013 54.6%
Active Learners 1 Step 完了	3,184 75.9%	3,184 70.8%	1,874 61.2%	3,509 72.5%	1,183 64.4%	1,125 67.9%	766 75.6%
Social Learners コメント投稿者	925 22.1%	586 22.1%	256 18.9%	1,014 21%	361 19.7%	317 19.1%	252 24.9%
90% Completion ほぼ終了した受講者	828	474	252	720	272	366	16
Comments 総コメント数	8,008	5,914	2,117	11,495	4,556	3,789	1,088
R-Index コース継続指数	36.4%	36.4%	40%	33.8%	33.8%	41.2%	
Certificate/Upgrade	79	36	33	36	28	50	16

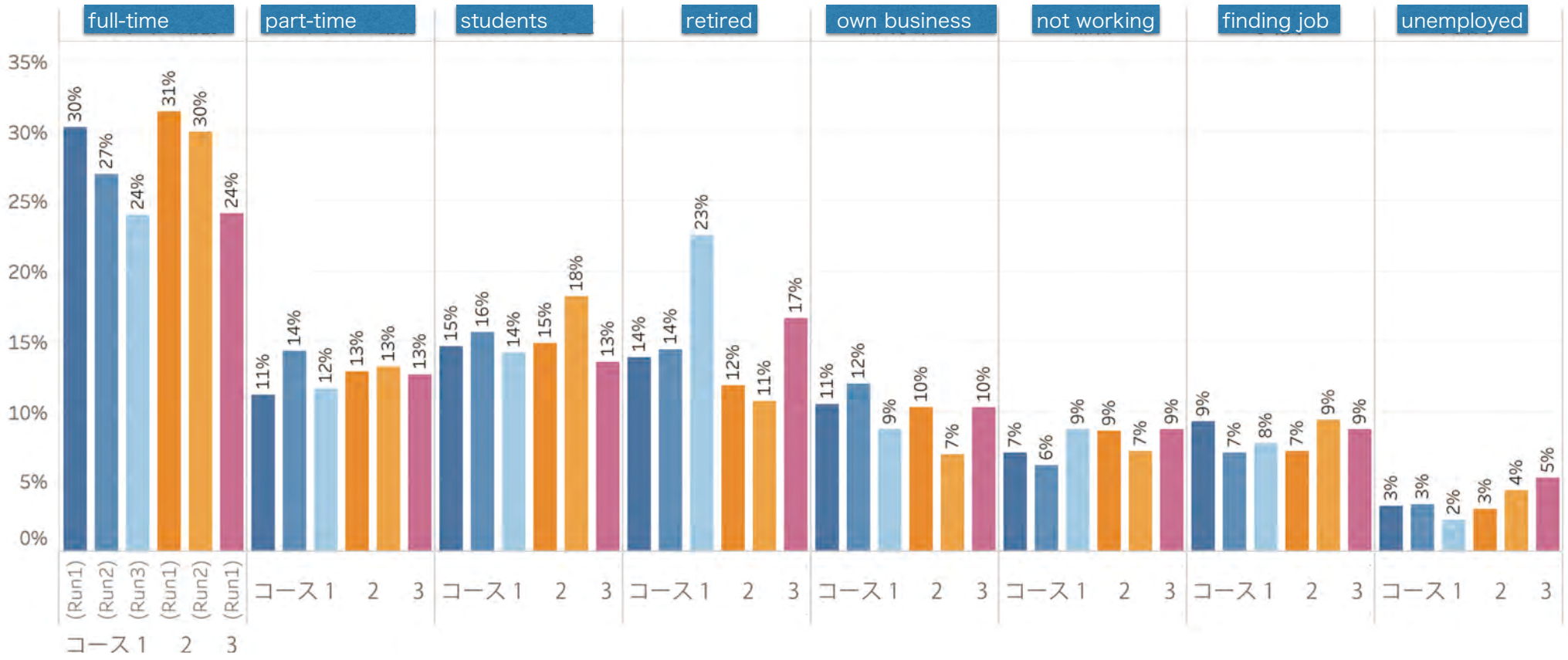
Course Measures

Ages



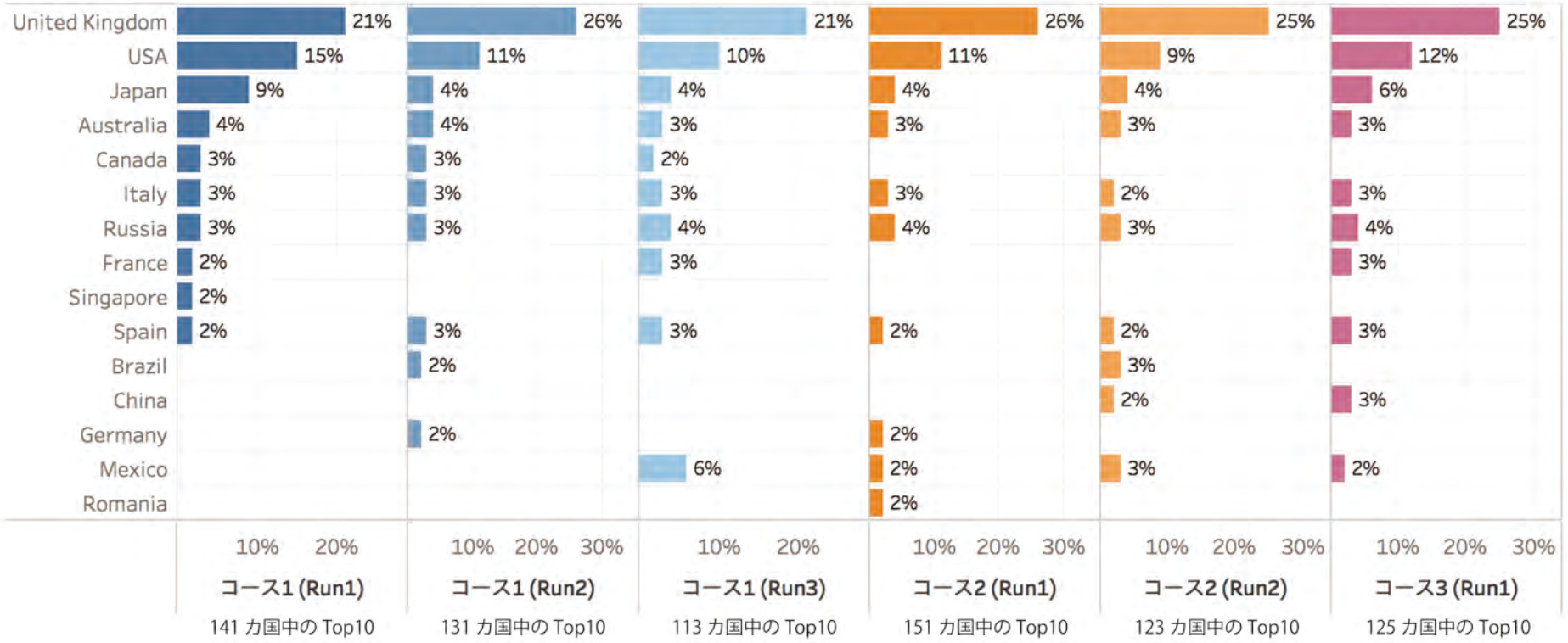
Course Measures

learners status

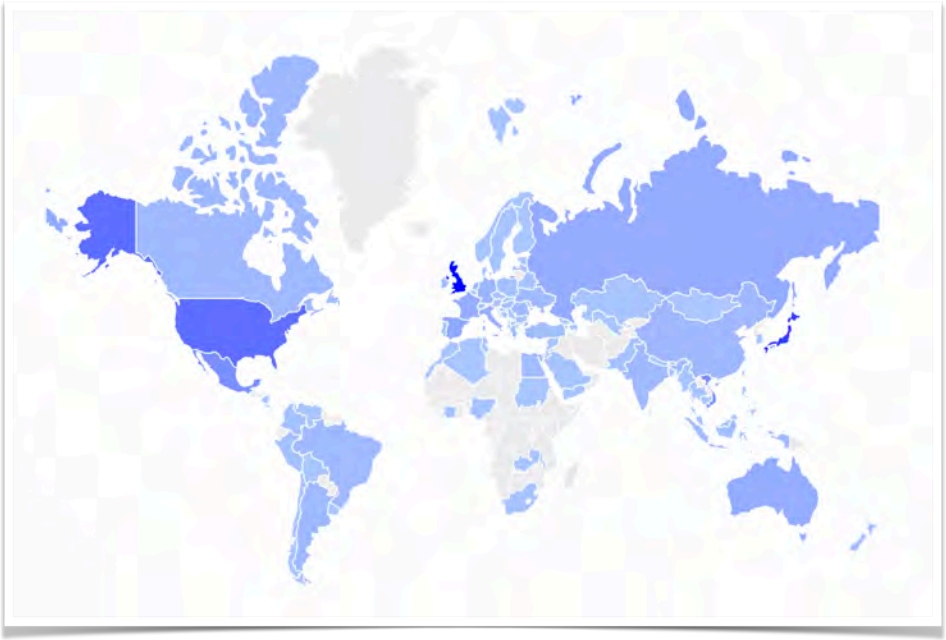


Course Measures

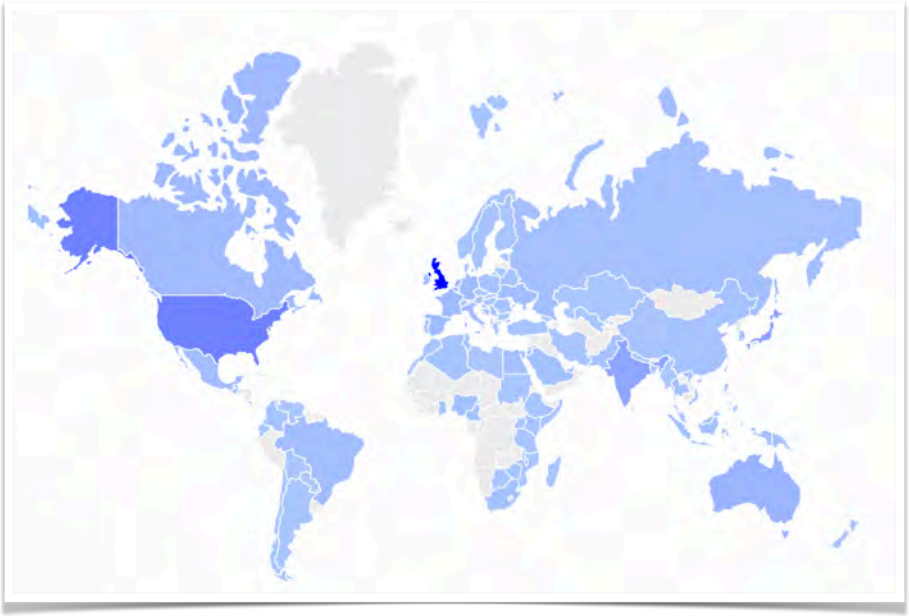
Country/Area



Japanese Culture Through Rare Books

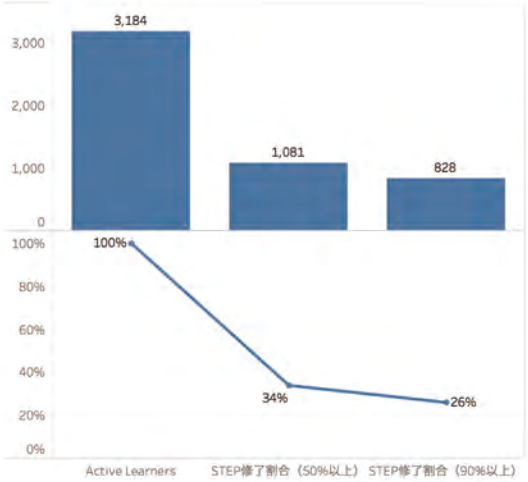


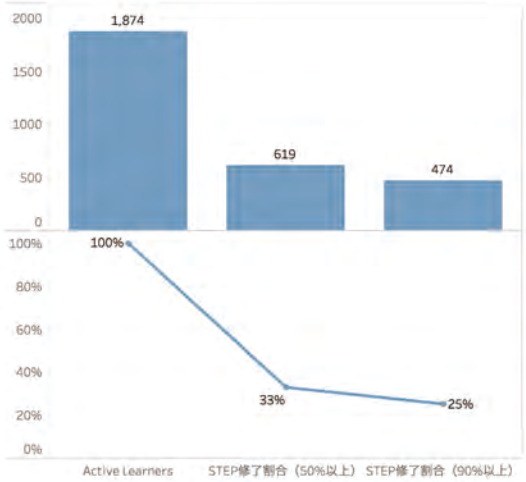
Quantum Computers

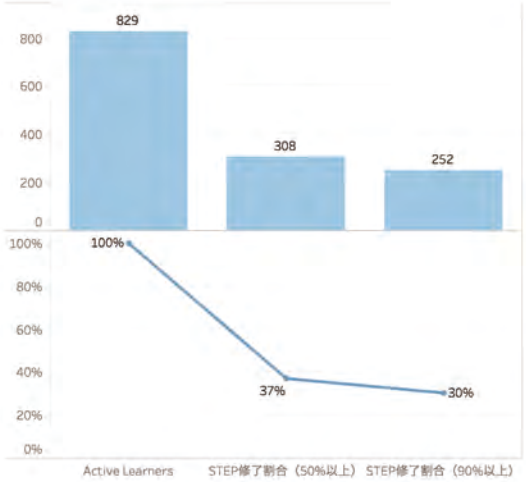


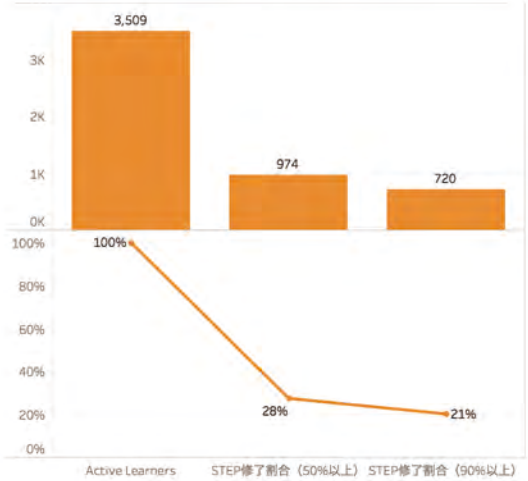
Course Measures

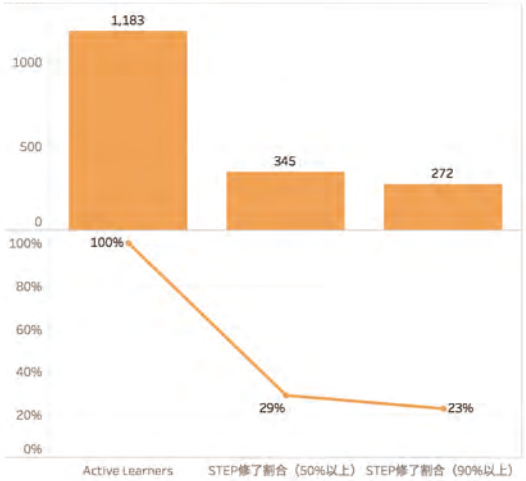
week by week

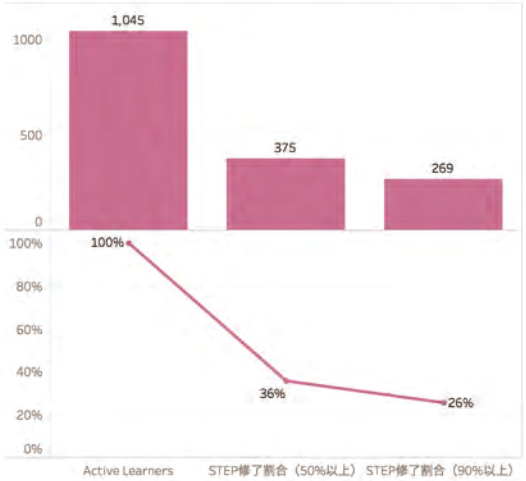












Courses to come from Keio University

- Washi - Japanese paper in Rare Books
  Keio Institute of Oriental Classics

- Diving into the World of Japanese Avant-garde Art Through Hijikata Tatsumi's Butoh Dance
  Keio University Art Center

- International relationship - view from Japan
  Faculty of Policy Management

- Elderly Society
  Faculty of Nursing and Medical Care

Komorebi (Japanese)
The sunlight that filters through the leaves of the tress
Ko
The words exit only in their vocabulary
“Lost in translation” by Ella Frances Sanders

Language and Technology
Enrich Culture
by Global collaboration
in Global Space

人はみな伝え合いたい！

Keiko Okawa
Keio University Graduate School of Media Design

Oxford Day 2017 : Power of Language
October 22nd, 2017 (Sun)