LibreOffice

CJK Issues on LibreOffice
(Based on Korean and Hanja 漢字)

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- LibreOffice Korean Team(리브레오피스 우리말 모듬)
- LibreOffice Asia Conference 2019, Tokyo, Japan
- 2019-05-25 토요일 (土曜日 , 星期六 , Saturday)

Who am I?

- Korean(한국사람 , 韓國人 , 韓国人 , 韩国人)

- FLOSS Korean Translator, Contributor

  - Leader of LibreOffice Korean Team(2017~)

  - The Document Foundation Membership(2019.01~)

  - Contributed to LibreOffice, Korean IME libhangul, KDE kCharSelect, GNU libunistring, GNOME gucharmap, GNOME characters, etc.

Index(목차 / 目次)

- Korean Language (우리말 , 한국말 / 조선말)
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- CJK Issues, Bugs (especially Korean Languages)
- Hanja(한자 / 漢字)
  - Korean Issues
  - Variant Ideographs(이체자 / 異體字 / 異体字 / 异体字)
- FLOSS in North Korea(북한의 자유 오픈소스 소프트웨어)

Korean Language

- **우리말** (u-ri-mal, Literally "Our Language") – Neutral
- **한국말** [韓國말](han-guk-mal) / **한국어** [韓國語](han-guk-eo) – South Korea
- **조선말** [朝鮮말](jo-seon-mal)/ **조선어** [朝鮮語](jo-seon-eo)
  - North Korea, 연변 조선족 자치주 / 延边 朝鮮族 自治州 / Yanbian Korean Autonomous Prefecture & 장백 조선족 자치현 / 长白朝鮮族自治县 / Changbai Korean Autonomous County, Jilin Province, People's Republic of China.
- **고려말** [高麗말](go-ryeo-mal, Корё мар)
  - Russia & CIS[Commonwealth of Independent States]

Korean Language

- Korea Peninsular
  - South Korea – 한국 사람 / 韓國人
  - North Korea – 조선 사람 / 朝鮮人
- Mainland China - 朝鮮族 / 朝鲜族
- Japan - 在日韓国人・在日朝鮮人
- Russia & CIS[Commonwealth of Independent States]
  - Russia, Uzbekistan, Kazakhstan, Kyrgyzstan, etc
    - Koryo-saram (Russian: Корё сарам; Korean: 고려사람)

Korean Language

CNR 중국조선어방송넷
中国朝鲜语广播网
중앙인민방송국
中央人民广播电台   www.krcnr.cn

Korean Broadcasting Service in Mainland China
http://www.krcnr.cn/

КОРЁ ИЛЬБО
(고려일보/高麗日報)
Korean Newspaper
in Kazakhstan
http://www.koreilbo.com/

민단 (MINDAN)
재일본대한민국민단
在日本大韓民國民團
Korean Residents Union in Japan
https://www.mindan.org/kr/

Korean News paper
in Sakhalin, Soviet Union(Russia), 1984

2019년 5월 21일 화요일 | 日本語 | 잡지"이어" | facebook

조선신보

첫페지   주요뉴스   운동, 생활   조국, 정세   문화   체육   시론   메아
구독신청   문의 및 기사제공   2011년 이전기사 검색   회사소개

《우리 함께 통일을 이룩하자》 / 4.27판문점선언발표 1돐을 경축, 조청, 류학동,
한청이 도꾜에서 공동행동
4.27판문점선언발표 1돐을 경축하여 4월 27일 조청, 한청, 류학동이 판문점선언리행을
위한…

주목단어
김정은원수님   조선외무성   조국방문   고등학교무상화   교육보조금   분회   녀

人民网 people.cn
中国共产党新闻网 | 地方领导留言板 | 人民日报报系 | 强国社区 | 旗下网站 | 无障碍
中央文献网 | 中国共产党历史网 | 中组部12380举报网 | 全国社科规划网 | 中国统一战线新闻网 | 中直党建网 | 紫光阁网
登录 注册

滚动 时政 国际 财经 台湾 军事 观点 领导 视频 人事 理论 法治 社会 产经 教育 科普 体育 文化 书画 房产 汽车 健康 科技 ＋

京 津 冀 晋 蒙 辽 吉 黑 沪 苏 浙 皖 闽 赣 鲁 豫 鄂 湘 粤 桂 琼 渝 川 黔 滇 藏 陕 甘 青 宁 新 鹏 雄安

ᠪ ᠁ 조선어 ᠁ Sawcuengh BIG5 English 日本語 Français Español Русский язык 한국어 Deutsch Português

조선어/朝鲜語, Ethnic Korean in China Version   한국어/韓國語, South Korean Version

조선신보 (朝鮮新報)
Korean Newspaper in Japan
https://chosonsinbo.com/

Korean Language

- Regulator
  - 대한민국 / 大韓民國 (Republic of Korea, South Korea)
    - National Institute of the Korean Language
      국립국어원 (國立國語院)
  - 조선민주주의인민공화국 / 朝鮮民主主義人民共和國 (North Korea)
    - The Language Research Institute, Academy of Social Science
      사회과학원 어학연구소 (社會科學院 語學研究所)
  - People's Republic of China(중화인민공화국 / 中华人民共和国)
    - China Korean Language Regulatory Commission
      중국조선어규범위원회 (中国朝鲜语规范委员会)

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Korean Language

- **Standard Korean**
  - 대한민국 / 大韓民國 (Republic of Korea, South Korea)
    - 표준말 (標準말), 표준어 (標準語)
  - 조선민주주의인민공화국 / 朝鮮民主主義人民共和國 (North Korea)
    - 문화어 (文化語)
  - People's Republic of China(중화인민공화국 / 中华人民共和国)
    - 중국조선말 (中國朝鮮말), 中国朝鮮语

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Korean Language

조선어학회 / 朝鮮語學會
Korean Language Society
한글 맞춤법 통일안 (1933)
Standardized of Korean Spelling

Divided two Koreans(1950~)

South Korea: 표준어
한글학회
Korean Language Society
국립국어원
National Institute of Korean Language

North Korea: 문화어
사회과학원 어학연구소
The Language Research Institute
Academy of Social Science

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Korean Language

- **Writing System**
  - **Hangul Jamo 한글 자모 - Consonants & Vowels**
    - Initial Consonants: ㄱ , ㄴ , ㄷ , ⋯ , ㅌ , ㅍ , ㅎ [ㄱ - ㅎ]
    - Vowels: ㅏ , ㅑ , ㅓ , ㅕ , ⋯ , ㅡ , ㅣ [ㅏ - ㅣ]
    - Final Consonants: ㄱ , ㄴ , ㄷ , ⋯ , ㅌ , ㅍ , ㅎ [ㄱ - ㅎ]
  - **Hangul Syllables 한글 음절 - Syllables**
    - 가 , 각 , 갸 , 나 , 다 , 하 , 힣 , [가 - 힣]
  - **Hanja 한자 / 漢字 – Ideographs or Chinese Characters**
  - **Alphabet**
    - a,b,c,…,x,y,z,A,B,C,…,X,Y, Z [a-zA-Z]

Korean Language

- Writing System
  - The order of the Korean alphabet(Hangul Jamo) in South and North Korea is different.
  - 한국의 표준어 (標準語 , South Korea's Standard Korean Language)
    ㄱ ㄲ ㄴ ㄷ ㄸ ㄹ ㅁ ㅂ ㅃ ㅅ ㅆ ㅇ ㅈ ㅉ ㅊ ㅋ ㅌ ㅍ ㅎ
  - 북한 및 중국 조선족 (朝鮮族 / 朝鮮族) 의 문화어 (文化語 , North Korea and Korean Ethnic in China's Standard Korean Language)
    ㄱ ㄴ ㄷ ㄹ ㅁ ㅂ ㅅ ㅈ ㅊ ㅋ ㅌ ㅍ ㅎ ㄲ ㄸ ㅃ ㅆ ㅉ ㅇ

LibreOffice

Korean Language

- Code
  - kor – Korean/ 우리말 / 한국 [韓國] 말 / 조선 [朝鮮] 말
    - ko_KR – 대한민국 / 大韓民國 , Republic of Korea(South Korea)
    - ko_KP – 조선민주주의인민공화국 / 朝鮮民主主義人民共和國 , Democratic People's Republic of Korea(North Korea)
    - ko_CN – Official in 연변 조선족 자치주 / 延边 朝鮮族 自治州 Yanbian Korean Autonomous Prefecture & 장백 조선족 자치현 / 长白朝鮮族 自治县 Changbai Korean Autonomous County, Jilin Province, People's Republic of China.
  - jje – 제주어 / Jejueo (ISO639-3)
    - https://iso639-3.sil.org/request/2014-004

Korean Language

- **Korean Document Standard Specifications**
  - **KS X 6101**
    - 개방형 워드프로세서 마크업 언어 (OWPML) 문서 구조
      Open word-processor markup language(OWPML) document structure
  - **KS X ISO/IEC:26300**
    - 정보기술ー오픈도큐먼트 양식
      Information technology ー Open Document Format for Office Applications(OpenDocument) v1.0
- Taiwan - **CNS15251-ODF**
- Japan - **JIS X 4401**

East Asian Cultural Hemisphere & CJKV

- Ideographs or "Chinese Character 漢字"
- CJKV[Chinese, Japanese, Korean Vietnamese]

CJKV

- CJKV is an abbreviation for Chinese, Japanese, Korean, and Vietnamese.

- Mainland China, Taiwan, Hong Kong, Japan, Korea, Vietnam were/are used Chinese Characters

- LibreOffice has many language-specific features and issues, CJKV issue is one of them.

CJKV

- Regions where Chinese characters were/are used
  - https://commons.wikimedia.org/wiki/File:Map-Chinese_Characters.png
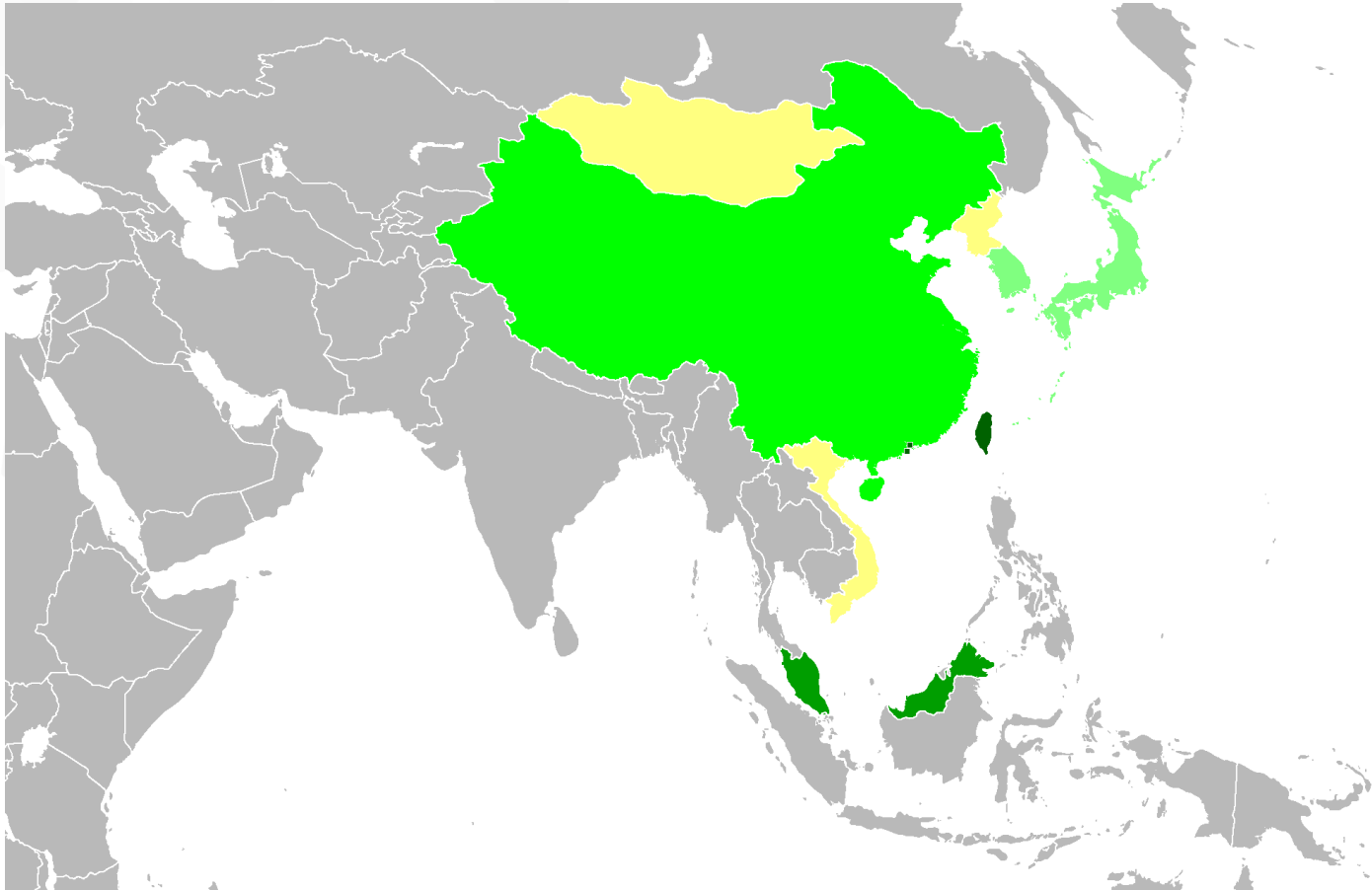
CJKV

- The ways of saying and writing of "Sinosphere" in CJKV

  - https://commons.wikimedia.org/wiki/File:%E6%BC%A2%E5%AD%97%E6%96%87%E5%8C%96%E5%9C%88%EF%BC%8F%E6%B1%89%E5%AD%97%E6%96%87%E5%8C%96%E5%9C%88_%C2%B7_%ED%95%9C%EC%9E%90_%EB%AC%B8%ED%99%94%EA%B6%8C_%C2%B7_V%C3%B2ng_v%C4%83n_h%C3%B3a_ch%E1%BB%AF_H%C3%A1n_%C2%B7_%E6%BC%A2%E5%AD%97%E6%96%87%E5%8C%96%E5%9C%8F.svg

CJKV Issues, Bugs

- CJKV Language Issues
- Deal with some Korean Language and Chinese and Japanese common issues and Korean's unique issues.

CJKV Issues, Bugs

- Bug 83066(CJK)
  - CJK bugs are tracked META issues
    - https://bugs.documentfoundation.org/show_bug.cgi?id=83066

- Bug 113193 (CJK-Chinese-Traditional)
  - [META] Traditional Chinese (zh_TW, zh_HK) language-specific CJK issues
    - https://bugs.documentfoundation.org/show_bug.cgi?id=113193

- Bug 113194 (CJK-Chinese-Simplified)
  - [META] Simplified Chinese (zh_CN) language-specific CJK issues
    - https://bugs.documentfoundation.org/show_bug.cgi?id=113194

CJKV Issues, Bugs

- Bug 113195 (CJK-Japanese)
  - [META] Japanese language-specific CJK issues
    - https://bugs.documentfoundation.org/show_bug.cgi?id=113195
- Bug 113196 (CJK-Korean)
  - [META] Korean language-specific CJK issues
    - https://bugs.documentfoundation.org/show_bug.cgi?id=113196

Dangi 단기 , Former Official Republic of Korea era

- Traditional Korean Calendar - Dangi(단기 , 檀紀)
  - The era name originating from the foundation of Gojoseon[고조선 / 古朝鮮] is also widely used in Korea as an indication of long civilization of Korea.
    - Full name: **Dangun-giwon** (단군기원 , **檀君紀元** "First Age of Lord Dangun" : 1948-1961)
    - Abbreviation Name: **Dangi**(단기 , **檀紀**)
    - The Dangi Calendar measures years from the ancient founding of Korea in 2333 B.C.

Dangi 단기 , Former Official Republic of Korea era

- Traditional Korean Calendar - Dangi(단기 , 檀紀)
  - Until 1961, Republic of Korea(대한민국 / 大韓民國 , a.k.a. South Korea) officially used to Dangi(단기 / 檀紀) era
    - http://www.law.go.kr/법령/연호에관한법률/(00004,19480925)
      - 年號에關한法律 [시행 1948. 9. 25.] [법률 제 4 호 , 1948. 9. 25., 제정]
        大韓民國의 公用年號는 檀君紀元으로 한다 .
        附則 < 법률 제 4 호 , 1948. 9. 25.> 本法은 公布日로부터 施行한다 .
  - [Bug 125446] Support to Korean Traditional Calendar, Dan-gi(단기 / 檀紀) Calendar on LibreOffice
    https://bugs.documentfoundation.org/show_bug.cgi?id=125446
  - Support to Korean Dangi Calendar for Tdf#125446
    https://gerrit.libreoffice.org/#/c/72943/ & https://gerrit.libreoffice.org/#/c/72944/

LibreOffice

Dangi 단기 , Former Official Republic of Korea era

▼ Windows 10 support Dangi Calendar

▼ ICU library support Dangi Calendar

   ▼ ICU4C 50
     http://bugs.icu-project.org/trac/ticket/9255

   ▼ ICU4J 51
     http://bugs.icu-project.org/trac/ticket/9616

Dangi 단기 , Former Official Republic of Korea era

▾ Example of Microsoft Excel and Hancom Hancell[ㅎ · ㄴ 셀]

Dangi 단기 , Former Official Republic of Korea era

▼ Example of Hancom Hancell[ㅎ · ㄴ셀] and LibreOffice

Dangi 단기| , Former Official Republic of Korea era

- Example of Microsoft Excel and Hancom Hancell[ㅎ · ㄴ셀]
  - Dangi Calendar and Cell attributes

Gregorian Calendar	Dangi Calendar	Cell attributes
2019-05-25	4352-05-25	[$-50000]yyyy-mm-dd;@
19-5-25	52-5-25	[$-50000]yy-m-d;@
2019 년 5 월 25 일 토요일	4352 년 5 월 25 일 토요일	[$-50412]yyyy" 년 " m" 월 " d" 일 "dddd;@
2019 년 5 월 25 일	4352 년 5 월 25 일	[$-50000]yyyy" 년 " m" 월 " d" 일 ";@
2019 년 05 월 25 일 토요일	4352 년 05 월 25 일 토요일	[$-50412]yyyy" 년 " mm" 월 " dd" 일 "dddd;@
2019 년 05 월 25 일	4352 년 05 월 25 일	[$-50000]yyyy" 년 " mm" 월 " dd" 일 ";@

Dangi 단기 , Former Official Republic of Korea era

Mac OS X tooltip error

- One of the CJK(Korean, Chinese, Japanese) Issues
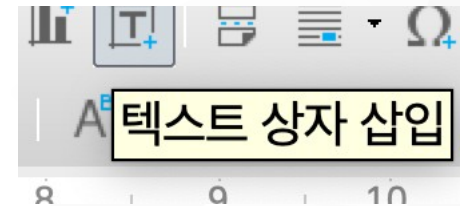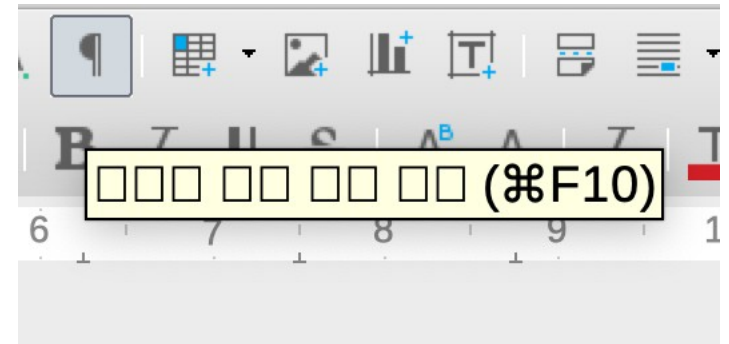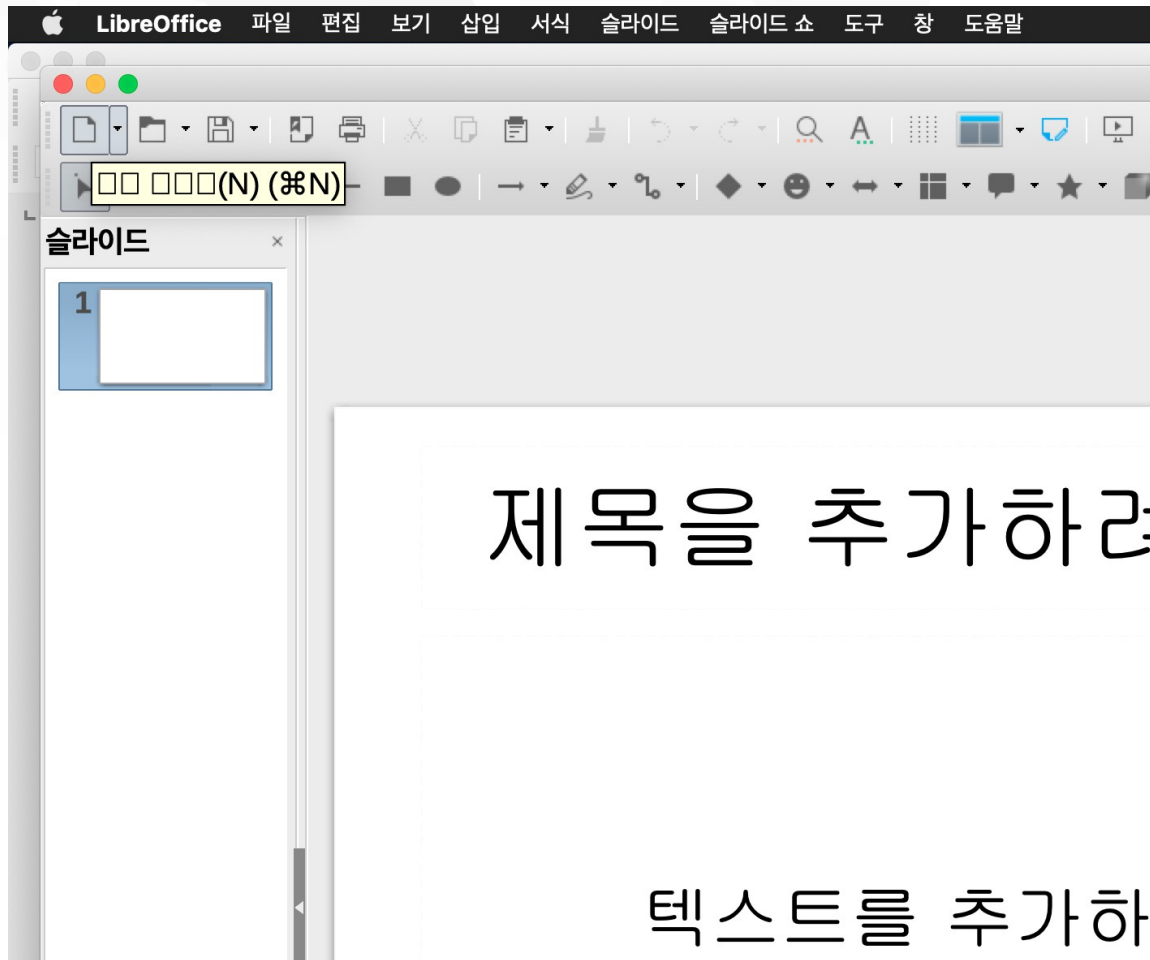
Mac OS X tooltip error

- [Bug 108042] - Tooltips display for toolbar icons suffer from broken font fallback on OSX in CJK UIs
  - https://bugs.documentfoundation.org/show_bug.cgi?id=108042
- [Bug 123548] - Tooltip's Korean text is shown only '□□□□' on Mac OSX (only)
  - https://bugs.documentfoundation.org/show_bug.cgi?id=123548

Korean Hanja Conversion Menu Bug

- Korean Hanja Conversion Menu bugs
  - Korean Hanja Ruby Notation bug
    - Korean Hangul/Hanja Conversion Menu's "add Korean Ruby script" not work
      - https://bugs.documentfoundation.org/show_bug.cgi?id=117857
  - Don't convert Hanja to Hangul
    - Some Hanja characters have multiple Sounds[다음자 / 多音字]
      - Korean Hanja to Hangul Conversion can't show multiple Korean Hangul Characters
      - https://bugs.documentfoundation.org/show_bug.cgi?id=118476

Korean Hanja Conversion Menu Bug

◥ Korean Hanja Ruby Notation Bug
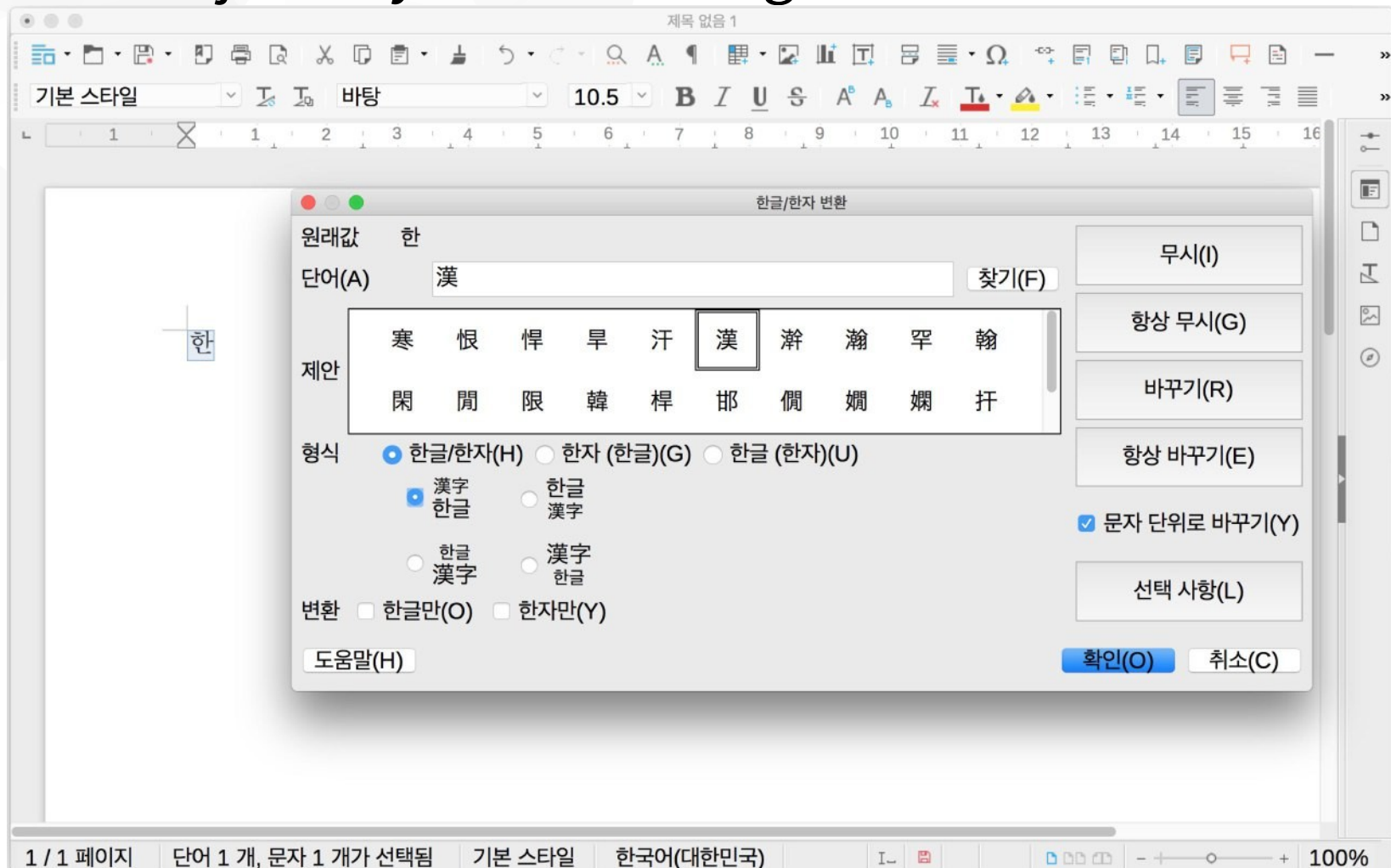
Korean Hanja Conversion Menu Bug

� Work normally Korean Hanja Ruby Notation on OpenOffice
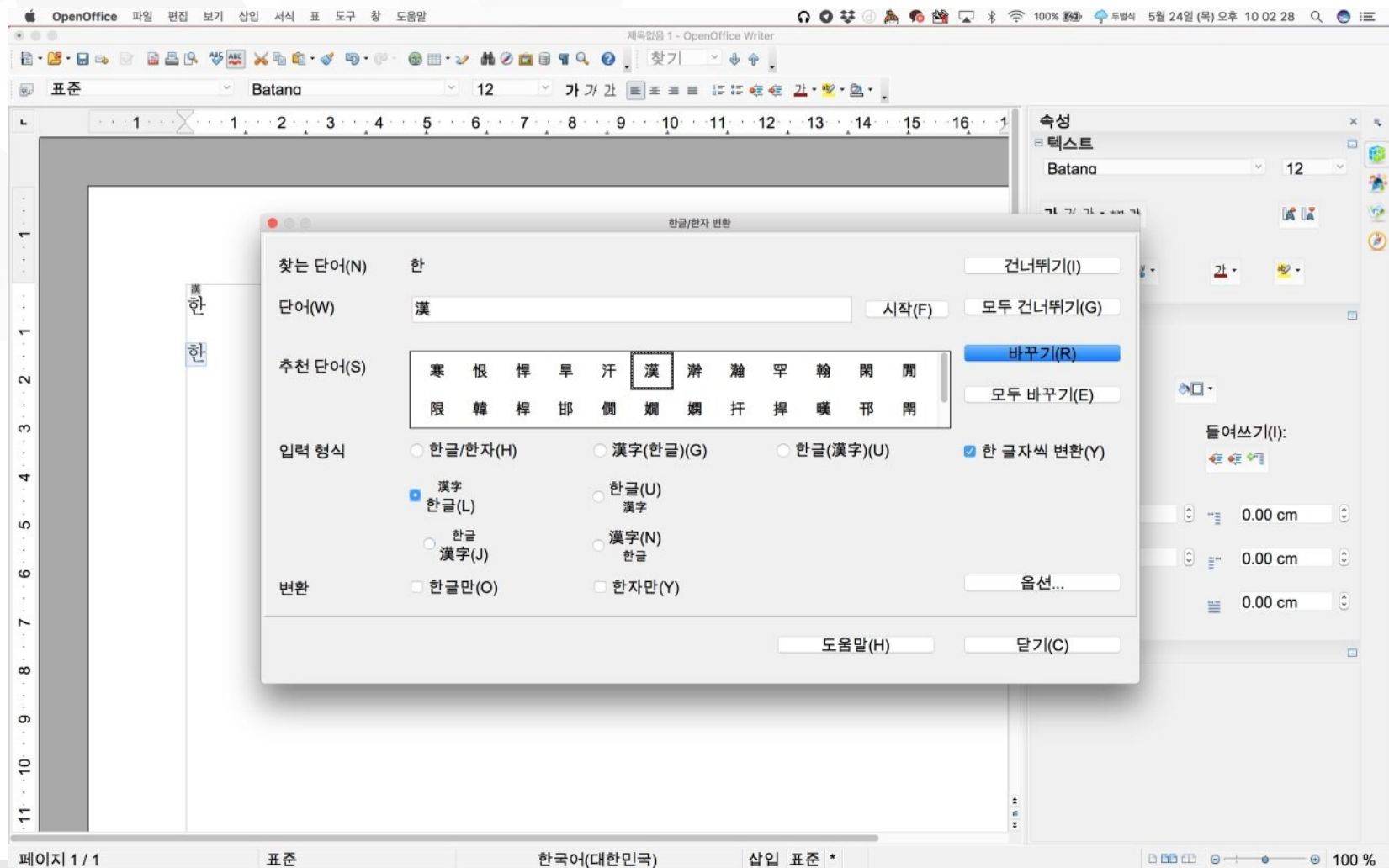
Example of Korean Hanja Ruby characters
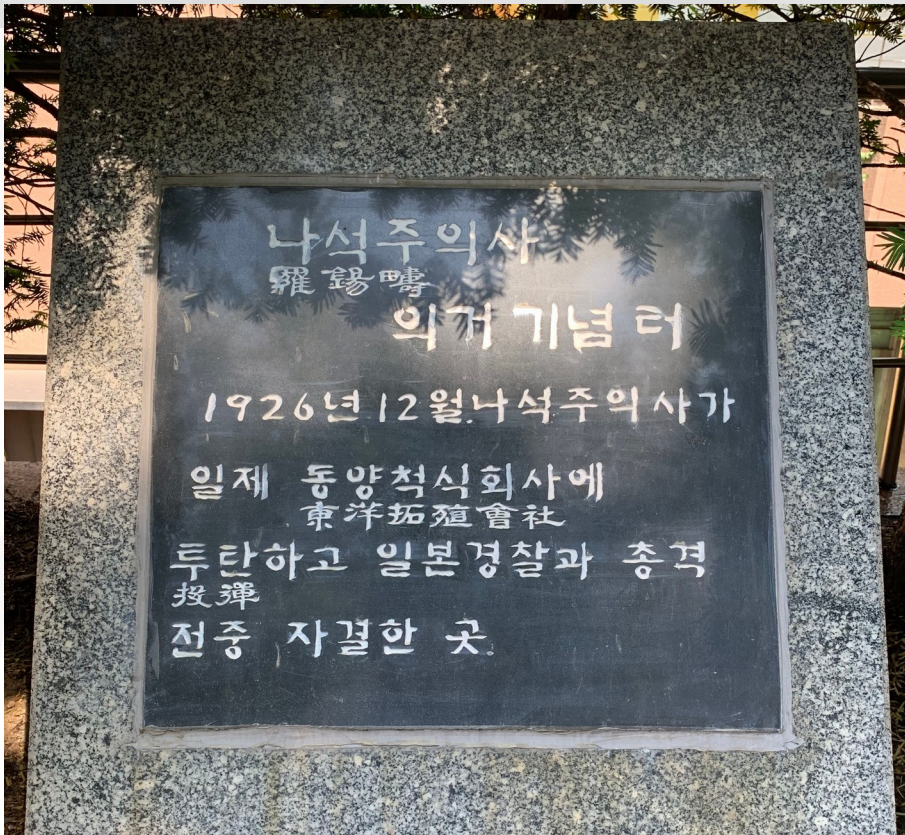
천지지도　　일음양오행이이
天地之道는° 一陰陽五行而已니라。

천지의 이치는 오직 음양과 오행뿐이다.

곤복지간　　위태극　　이동정지후　　위음양
坤復之間이 爲太極이요° 而動靜之後에 爲陰陽이니라。

음陰이 극에 달한 곤坤과 양陽이 태어나려는 복復, 그 사이야말로

태극太極이며, 움직이고는 멈춘 후에 음양이 되는 것이다.

나석주의사
羅錫疇
의거 기념 터

1926년 12월.나석주의사가

일제 동양척식회사에
東洋拓殖會社

투탄하고 일본경찰과 총격
投彈

전중 자결한 곳.

국가원수의 공식호칭은 총통總統이다. 임기는 1996년 수·개정 헌법상 4년으로 1차에 한하여 연임할 수 있는 4년 중임重任제다. 영어 President 의 의미인 총통이라는 용어가 중국역사에 등장하게 된 것은 1911년, 신해 혁명으로 청조가 멸망하므로써 황제皇帝 혹은 천자天子라 불리던 봉건군주 가 역사에서 자취를 감추고 난 후이다. 비록 혁명에 성공하였지만 당시 중 화민국은 각 지방의 군벌軍閥들에 의해서 분열되어 있었다. 쑨원과 중앙정 부의 힘은 미약하였다. 쑨원은 혁명 성공 후 중화민국임시대총통으로 추 대된다. 하지만 곧 현실상의 이유로 인하여 북양군벌北洋軍閥의 실력자이던 위안스카이袁世凱(원세개)에게 공화국 대총통직을 양보하게 되어 1912년 위 안스카이가 중화민국 대총통으로 취임한다. 총통이라는 칭호가 역사에 등 장한 순간이다.

| 1 | 대학지도 재명명덕 재친민 재지어지선
大學之道 在明明德 在親民 在止於至善 |

지지이후유정 정이후능정 정이후능안 안이후ㅡ
知止而后有定 定而后能靜 靜而后能安 安而后

려이후능득
慮而后能得

Line breaking rules in Korean 줄 바꿈 규칙

- Line breaking rules - 줄바꿈 규칙 , 금칙처리
  - [Repository] modified Line Breaking rule in Korean
    https://gerrit.libreoffice.org/#/c/72492/
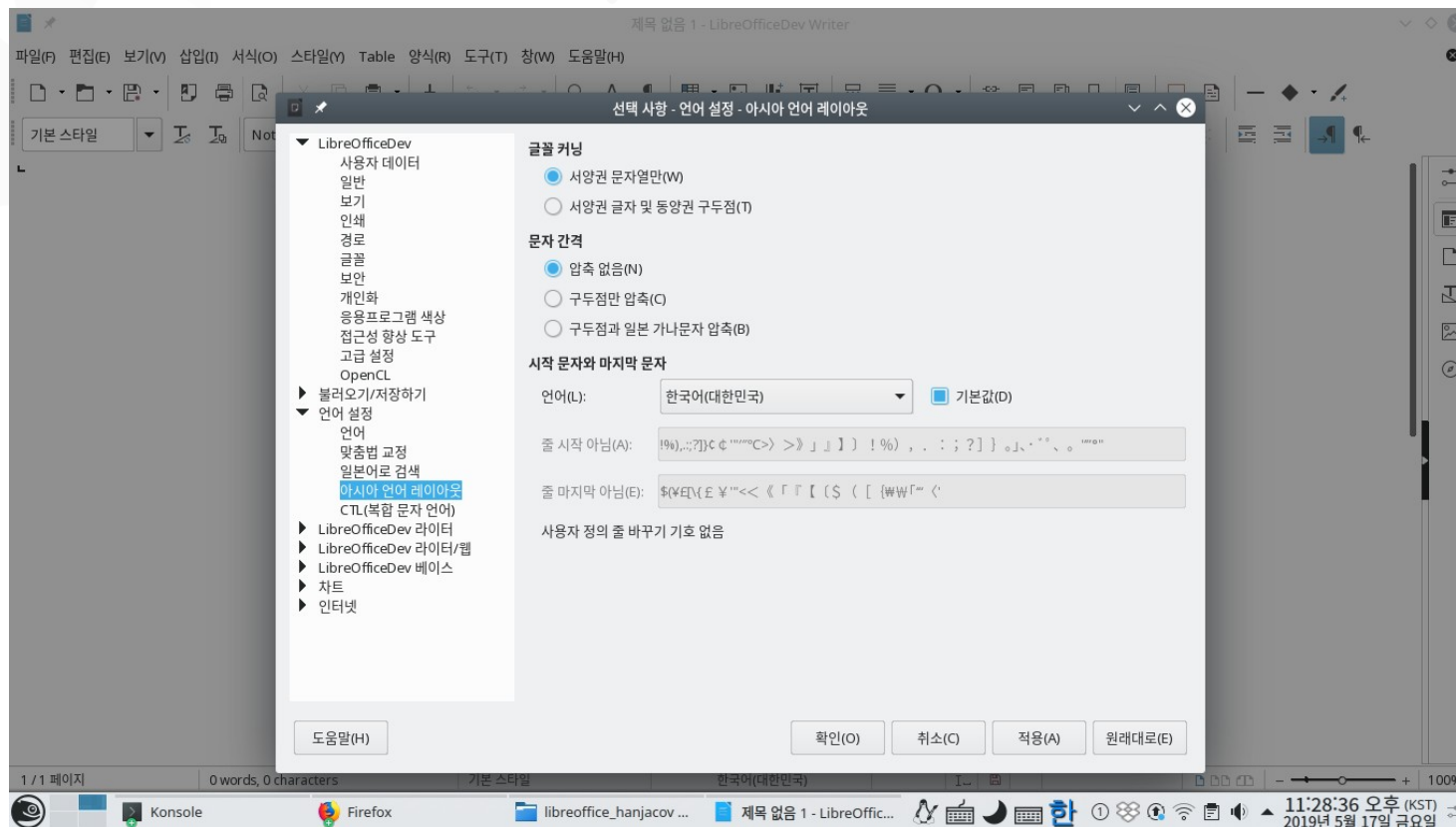
Korean Hanja Conversion Menu Bug

- Multiple Sounds are not shown on Korean Hanja Conversion Menu.→ 龜（ 구 gu, 귀 gwi, 균 gyun)
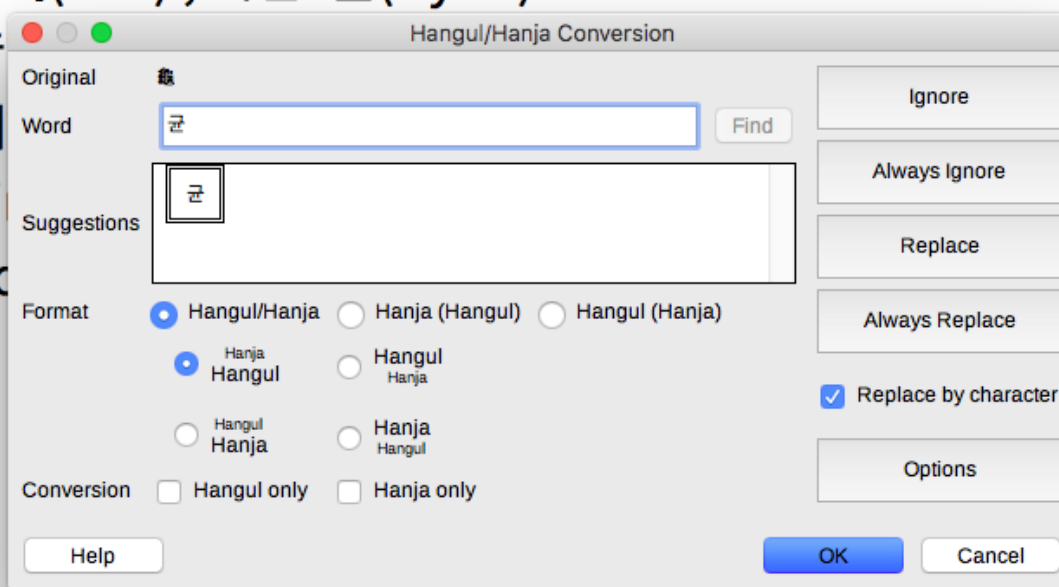
Korean Hanja Conversion Menu Bug

- Multiple Sounds are not shown on Korean Hanja Conversion Menu.→ 寧（녕 nyeong, 령 ryeong, 영 yeong)
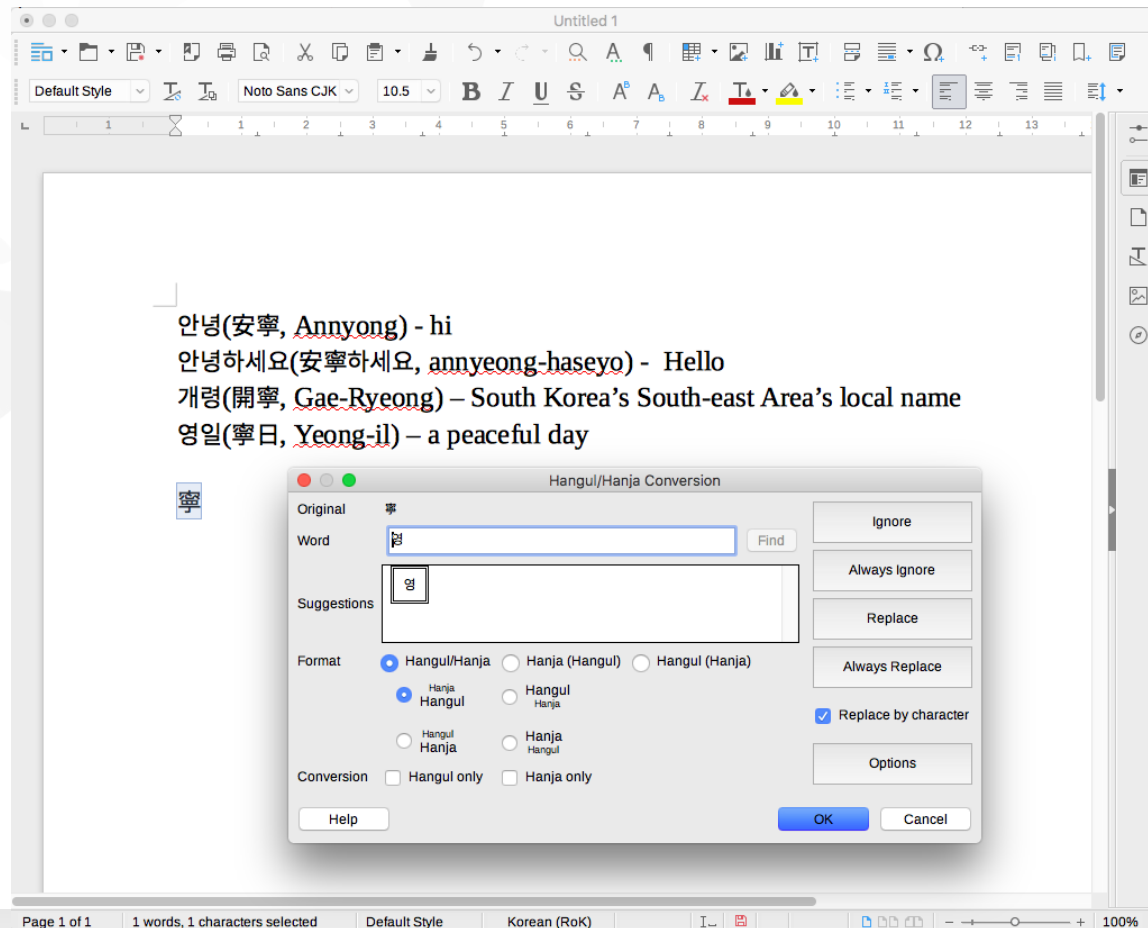
Classical Hangul & Jejueo Notation

- 아래아 (ㆍ , U+119E)
  - 옛한글 [Classical Hangul]
    - ㅂㆍ람 (바람 , wind)
    - ㄷㆍㄹ (달 , moon)
    - ㅎㆍㄴ글 – HWP Brand
  - Jeju-eo(제주어 / 濟州語 , Jeju Dialect) Notation
    - ㅎㆍㄴ저 옵서예 – Hello (안녕하세요)
    - ㅁㆍㅁ국 – Momguk, a Jeju dish(몸국)

Classical Hangul & Jejueo Notation

- ㅎ · ㄴ [U+1112 U+119E U+11AB]
  - ㅎ [U+1112] + · [U+119E] + ㄴ [U+11AB]
- ꥼ [U+114C U+116F U+11D9]
  - ꥼ [U+114C] + ㅝ [U+116F] + ꥼ [U+11D9]
- ㆅ ㅣ ㄴ [U+1159 U+1175 U+11AB]
  - ㆅ [U+1159] + ㅣ [U+1175] + ㄴ [U+11AB]
- Example of Classical Hangul on Adobe Blog
  - https://blogs.adobe.com/CCJKType/2014/12/shs-development-archaic-hangul.html

1140 1175 11D9

Classical Hangul & Jejueo Notation

Example of LibreOffice (Linux, Mac, Windows)

Linux

Mac OS

Windows

Hanja/Ideographs/ 한자 / 漢字

- Hanja(한자 / 漢字) is the Korean Name for Chinese Characters/Ideographs(漢字 / 汉字)

Hanja/Ideographs/ 한자 / 漢字

- Commonly called "Chinese Characters" or "Ideographs" in English.
  - Widely uses in East Asian countries and regions such as Mainland China, Taiwan, Hong Kong, Macao, Korea, Japan, Vietnamese, etc.
- One character has one mean and one sound.
  - Exceptions
    - Some characters have multiple definitions.
    - Some characters have multiple sounds.
    - Some characters have both multiple definitions and multiple sounds.

Hanja/Ideographs/ 한자 / 漢字

- Exceptions
  - Some character glyph are variants.
  - Some character Meaning vary in regions.
    - 嵐
      - Korean: haze, heat shimmer
      - Chinese: mist
      - Japanese: storm

Hanja/Ideographs/ 한자 / 漢字

- Korean: 강희자체（康熙字體）/ 정자체（正字體）
- Japan
  - 旧字体 / 舊字體 (Kyūjitai, literally "old character forms")
  - 新字体 (Shinjitai, literally "new character forms")
- Chinese
  - 正體字 or 繁體字 (Traditional Chinese)
  - 简体字 (Simplified Chinese)

Hanja/Ideographs/ 한자 / 漢字

- The "PanCJKV" IVD Collection—Unregistered
  - https://blogs.adobe.com/CCJKType/2016/02/pancjkv-ivd-collection-unregistered.html

LibreOffice

Korean Hanja(한자 / 漢字) Issues

- KS X 1001:1992's 268 duplicated Hanja(한자 / 漢字)
- Beginning-Sound Rule 두음법칙 / 頭音法則
- Korean made Ideographs
- Korean Buddhism words(불교한자어 / 佛敎漢字語)

KS X 1001:1992

- Korean Language Information Processing Standard
- **Big Strong Bug**
  - only Supported Korean Hangul Syllable 2350 characters. (Unicode Hangul Syllable 11172 characters)
  - They designed wrong, Hangul[한글]–Hanja[한자 / 漢字] mapping 1:1 by Code Point
  - KS X 1001:1992 includes 268 duplicate hanja (with multiplereadings)—encoded in "CJK Compatibility Zone"

KS X 1001:1992 Examples

Beginning-Sound Rule 두음법칙 / 頭音法則

- A rule of Korean Language applied to Sino-Korean words
- Only uses in South Korea, don't use in North Korea.
  - 1. If the very first consonant of a Sino-Korean word is ㄹ , it is
    - 1) replaced by ㄴ , when NOT followed by ㅣ or a yotized vowel (ㅑ , ㅒ , ㅕ , ㅖ , ㅛ , ㅠ)
      - 來年 (래년) → 내년 (next year), 籠球 (롱구) → 농구 (basketball)
    - 2) or simply dropped (written ㅇ), when followed by ㅣ or a yotized vowel.
      - 歷史 (력사) → 역사 (history), 料理 (료리) → 요리 (cooking)

Beginning-Sound Rule 두음법칙 / 頭音法則

- 2. If the very first consonant of a Sino-Korean word is ㄴ and if that ㄴ is followed by ㅣ or a yotized vowel, the ㄴ is dropped (written ㅇ).
    - 女子 (녀자) → 여자 (woman), 紐帶 (뉴대) → 유대 (bond)
- 3. In addition, if 렬 or 률 is preceded by ㄴ or a vowel in a Sino-Korean word, it is replaced by 열 or 율 respectively.
    - 龜裂 (균렬) → 균열 (crack), 戰慄 (전률) → 전율 (shudder)

Korean made Ideographs

- 한국식한자（韓國式漢字），국자（國字）
  - Some characters were invented by Koreans themselves.
  - These are primarily formed in the usual way of Chinese characters, namely by combining existing components, though using a combination that is not used in China.

Korean made Ideographs

- Types
  - Create new Ideographs
    - Example] 마 (수 , ma), 시 (媤 , si), 답 (畓 , dap), 대 (垈 , dae), 점 (岾 , jeom), 것 (喾 , geot), 엇 (旕 , eot), 乭 (소 , so), 怾 (기 , gi)

      乭 (돌 , dol), 乧 (둘 , dul), 乭 (톨 , tol), 乫 (할 , hal), 乽 (잘 , jal) , etc
  - Mixed Hanja(한자 / 漢字) and Hangul Jamo
    - Example] 특 (걱 , geok), 껑 (강 , gang), 둥 (둥 , dung), 엉 (엉 , eong), etc
  - Mixed Hanja(한자 / 漢字) and Hangul Syllable
    - Example] ▨口도 , etc

Korean made Ideographs

- Example] AlphaGo against Go player 이세돌 (李世乭 , Lee Sedol)
  - 乭 – One of Korean made Ideographs
    - reads "dol(돌)" in Korean, means "Stone"
      - Mainland China
        - 李世石 ： AlphaGo 表现完美，我希望能赢一局 http://tech.qq.com/a/20160310/049908.htm
      - Taiwan
        - AlphaGo 擊敗李世石 李開復：機器 1-2 年內必完勝人類 https://www.chinatimes.com/realtimenews/20160309004968-260410
      - Hong Kong
        - 「人機對弈」落幕：李世石 1:4 負於 AlphaGo https://theinitium.com/article/20160309-dailynews-alphago/

LibreOffice

Korean made Ideographs

- Example] AlphaGo against Go player 이세돌 (李世乭 , Lee Sedol)
  - 乭 – One of Korean made Ideographs
    - reads "dol(돌)" in Korean, means "Stone"
      - Japan
        - 李世ドル（イ・セドル）
          https://twitter.com/googlejapan/status/709699162451918848
      - Korea
        - **이세돌**의 **돌 (乭)** 과 둘 (乧), 톨 (乭), 할 (乤)
          https://www.seoul.co.kr/news/newsView.php?id=20160310031012

Korean made Ideographs

▾ Example of 乭 (돌 ,dol)

Korean made Ideographs

- Mixed Hanja(한자 / 漢字) and Korean Hangul Jamo
  - https://twitter.com/ken_lunde/status/876541770699423744

Japanese made Ideographs

- 和製漢字（わせいかんじ , Wasei Kanji ）
    - They are primarily formed in the usual way of Chinese characters, namely by combining existing components, though using a combination that is not used in China.
    - Examples
        - 峠 とうげ
        - 辻 つじ
        - 笹 ささ
        - 畑 はたけ

Korean Buddhism words(불교한자어 / 佛敎漢字語)

- Korean Buddhism words came from India via China.
  - Buddhism words are origin from Sanskrit (संस्कृता, [saṃskṛtā] / 범어 / 梵語)
  - The Sounds of Some Korean Buddhism terms are different from Korean Hanja Sounds.
    - Example] 바라밀 (波羅蜜), 아뇩다라삼먁삼보리 (阿耨多羅三藐三菩提)

Budhism word	波羅蜜	阿耨多羅三藐三菩提
The Sound of Korean Budhism word	바라밀	아뇩다라삼먁삼보리
Korean Hanja Sound	파라밀	아욕다라삼맥삼보제

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Variant Ideographs

- Variant Ideographs/Chinese Characters
- 이체자 (異體字 / 異体字 / 异体字)

Variant Ideographs

- Variant Chinese characters exist within and across all regions where Chinese characters are used in Chinese Regions, Japanese Regions, Korean Regions.
  - Depending on habits and culture, region, Some characters glype are transformed. (Because of Handwritting)
  - Some of the governments of these regions have made efforts to standardize the use of variants, by establishing certain variants as standard.
  - As a result, Some divergence in the forms of Chinese characters used in Korea, Japan, Chinese regions[Mainland China, Taiwan, Hong Kong, Macao, Singapore, etc].

Variant Ideographs

Language	Countries & Regions	Ideographs	Reads
中文 Chinese	Mainland China	异体字	yìtǐzì
	Taiwan	異體字	yìtǐzì 一、 去一ˇ 卩、
	Hong Kong	異體字	ji6 tai2 zi6
우리말 Korean	Korea peninsular China, Japan Russia & CIS	異體字	이체자 icheja
日本語 Japanese	Japan	異体字	いたいじ itaiji

Variant Ideographs

- Introducing Source Han Sans: An open source Pan-CJK typeface
  - https://blog.typekit.com/2014/07/15/introducing-source-han-sans/

骨 骨 骨

Ideograph U+9AA8 ("bone"). From left to right: Simplified Chinese, Traditional Chinese, and Japanese/Korean (shared).

曜 曜 曜 曜

Ideograph U+66DC. From left to right: Simplified Chinese, Traditional Chinese, Japanese, and Korean.

LibreOffice
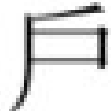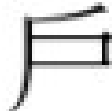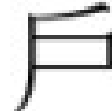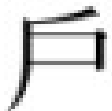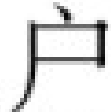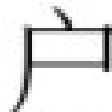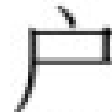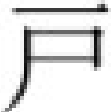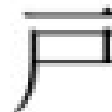
Variant Ideographs

	China	Hong kong	Taiwan	Japan	Korea	Vietnam
6B21 欠 76.2	次 G0-344E	次 HB1-A6B8	次 T1-4839	次 J0-3C21	次 K0-732D	次 V1-5B25
793E 示 113.3	社 G0-4967	社 HB1-AAC0	社 T1-4F23	社 J0-3C52	社 K0-5E64	社 V1-607C
8ACB 言 149.8	請 G1-476B	請 HB1-BDD0	請 T1-6E79	請 J0-4041	請 K0-746B	請 V1-6740
9053 辵 162.9	道 G0-3540	道 HB1-B944	道 T1-672C	道 J0-463B	道 K0-5433	道 V1-6953

CJK Unified Ideographs Range: 4E00–9FEA https://unicode.org/charts/PDF/U4E00.pdf

Variant Ideographs

- Definition: door; family, household
- There are the same meaning but different code points.
  - 戶 (U+6236) – Korea, Taiwan
  - 户 (U+6237) – Mainland China, Hong Kong
  - 戸 (U+6238) – Japan

Variant Ideographs

- Definition: Rooster
  - 雞 (U+96DE) – Taiwan, Hong Kong
  - 鸡 (U+9E21) – Mainland China
  - 鷄 (U+9DC4) – Korea
  - 鶏 (U+9D8F) – Japan
- Definition: Hometown
  - 故 (U+6545) 鄉 (U+9109) – Taiwan, Hong Kong
  - 故 (U+6545) 乡 (U+4E61) – Mainland China
  - 故 (U+6545) 鄕 (U+9115) – Korea
  - 故 (U+6545) 郷 (U+90F7) – Japan

Variant Ideographs

- Definition: Education
  - 教 (U+654E) 育 (U+80B2) – Korea
  - 教 (U+6559) 育 (U+80B2) – Mainland China, Taiwan, Hong Kong, Japan
- Definition: Research
  - 研 (U+784F) 究 (U+7A76) – Korea
  - 研 (U+7814) 究 (U+7A76) – Mainland China, Taiwan, Hong Kong, Japan

Variant Ideographs

- KS X 1001:1992 includes 268 duplicate hanja (with multiplereadings)—encoded in "CJK Compatibility Zone"
  - Example1] 樂 (악 ak, 낙 nak, 락 rak, 요 yo)

Glyph	Korean Hanja Sound 한국 한자음 / 韓國 漢字音	KS X 1001:1992	Unicode
樂	악 ak	68-37	U+6A02
樂	낙 nak	49-66	U+F914
樂	락 rak	53-05	U+F95C
樂	요 yo	72-89	U+F9BF

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Variant Ideographs

- However, Chinese and Japanese don't reserved multi-sounds code points, only one code point.
  - Example] Taiwan's COSCUP 2017 talk " ㄇㄉ，都 2017 了 注音還沒搞定嗎？ " by 董福興 (Bobby Tung)

一字最多六種讀音

 LibreOffice Korean Team(리브레오피스 우리말 모듬)

Variant Ideographs

- 自由香港字型 – 香港人造香港字
  - Homepage: https://freehkfonts.opensource.hk
  - HongKonger made Hong Kong's Ideographs
  - One of Open Source Hong Kong https://opensource.hk/ Project
  - Hong Kong Government released Hong Kong Supplementary Character Set (HKSCS), It defined Ideograph's glyph in Hong Kong
    https://www.ogcio.gov.hk/en/our_work/business/tech_promotion/ccli/hkscs/
  - 梁敬文，和他發起的「香港人造香港字」運動
    https://theinitium.com/article/20160410-changemaker-font/

Variant Ideographs

▼ Example of Free Hong Kong Fonts

自由香港楷書示範　　　　　　　　有關自由香港字型

自由香港楷書

歡迎試打自由香港楷書
常見例子：告 房 電 滋 妙

系統預設顯示字體
歡迎試打自由香港楷書
常見例子：告 房 電 滋 妙

鳴謝 Credit:
字型團隊：自由香港字型
雲端寄存：UDomain Web Hosting
技術支援：Open Source Hong Kong
原始碼：本網站原始碼 Source Code (License: General Public License 3.0)

自由香港楷書示範
https://kaidemo.opensource.hk/

LibreOffice

Variant Ideographs

- [Bug 121527] - CJK Ideograph Rendering Issue on LibreOffice Impress All Platforms(All Linux, Windows, Mac OSX etc).

  - https://bugs.documentfoundation.org/show_bug.cgi?id=121527

Variant Ideographs

令

- command, order, commandant, magistrate, allow, cause, decree, good, auspicious, dictation

- Example] Japan's New era name " **令和**" (reiwa)

  - Multiple meanings

The intentional meaning of Japan Government 日本国	Beautiful Harmony https://www3.nhk.or.jp/nhkworld/nhknewsline/backstories/neweraname/
Misunderstanding based on ambiguous Ideograph meaning	Orderly[令] Peace[平和], Order[令] and Harmony[和], Command[令] and Harmony [和] https://www.nytimes.com/2019/04/01/world/asia/japan-emperor-era-reiwa.html

Variant Ideographs

- Example] Japan's New era name " **令和**" (reiwa)
  - 新元号 「令」 の字に複数の形 どれが本当？
    https://www3.nhk.or.jp/news/html/20190401/k10011869751000.html
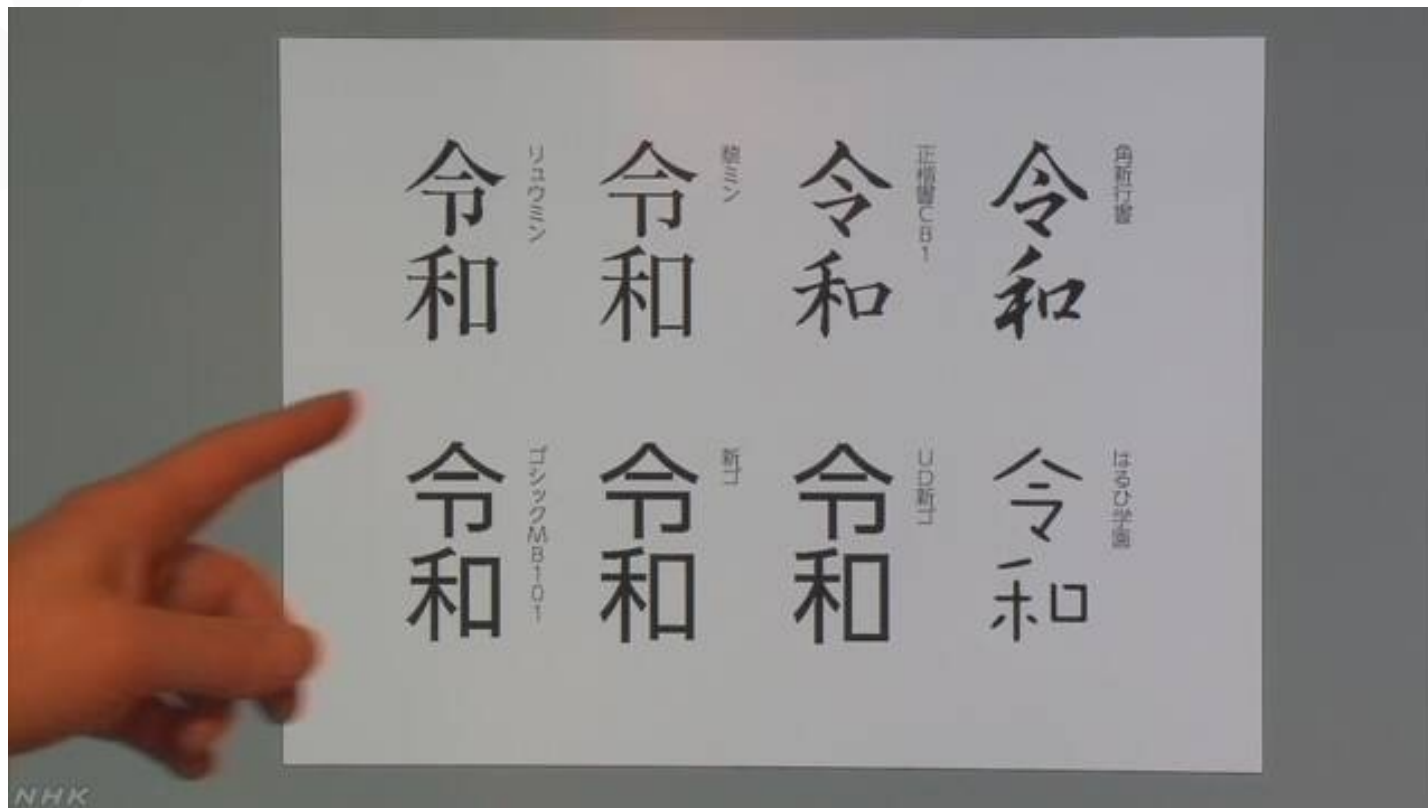
Variant Ideographs

- Example] Japan's New era name " 令和" (reiwa)
  - 令 have two code points
    - U+4EE4 & U+F9A8

Glyph	Korean Hanja Sound 한국 한자음 韓國 漢字音	KS X 1001:1992	Unicode
令	령 ryeong	54-21	U+4EE4
令	영 yeong	71-09	U+F9A8

References:

https://twitter.com/yabuki/status/1112565487995518979

# Variant Ideographs

- Unicode IVS/IVD & Unicode IDS
  - IVS(Ideographic Variation Sequence/Selector)/IVD(Ideographic Variation Database)
    - An Ideographic Variation Sequence (IVS) is a sequence of two coded characters, the first being a character with the Ideographic property that is not canonically nor compatibly decomposable, the second being a variation selector character in the range U+E0100 to U+E01EF.
      - https://unicode.org/reports/tr37/
  - IVS Example] IVD/IVS とは https://mojikiban.ipa.go.jp/1292.html

Variant Ideographs

- Unicode IVS(Ideographic Variation Sequence/Selector)/IVD(Ideographic Variation Database)
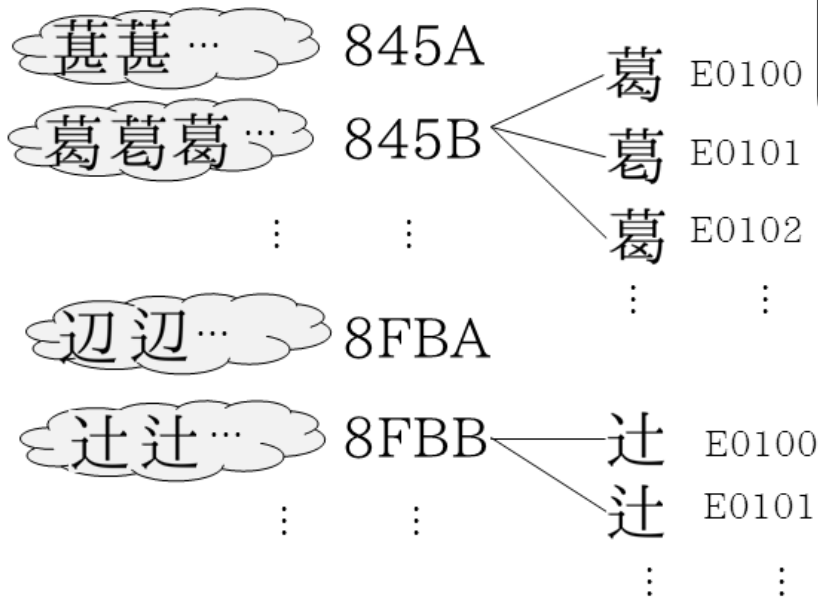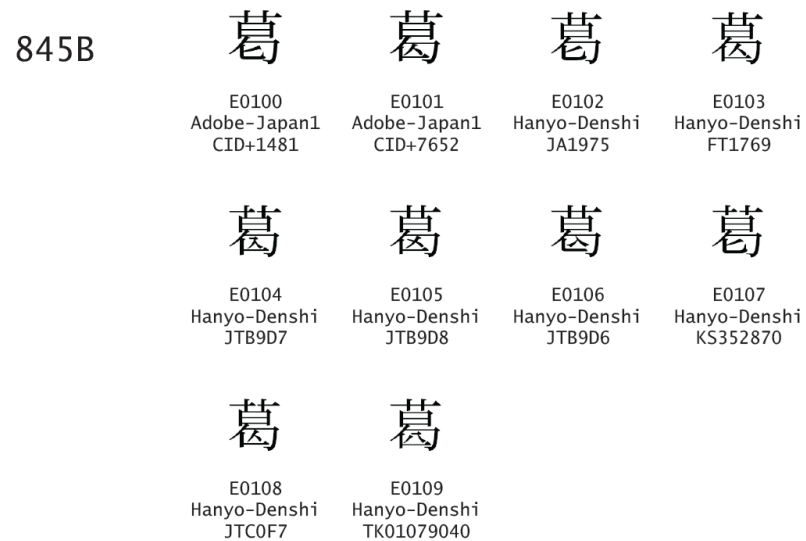
Variant Ideographs

- Unicode IVS/IVD & Unicode IDS
  - IDS(Ideographic Description Sequences)
    - method to describe composition of Han characters using ideographic description characters and character components
    - IDC[Ideographic Description Characters] is a Unicode block containing graphic characters used for describing CJK ideographs.

Variant Ideographs

- Unicode IDS(Ideographic Description Sequences)
  - Implements & Example]　https://組字.意傳.台灣
  - Github: https://github.com/sih4sing5hong5/han3_ji7_tsoo1_kian3
- IDS combination syntax
  - Left to right
  - Above to below
  - Left to middle and right
  - Above to middle and below
  - Full surround
  - Surround from lower left

Variant Ideographs

Character	Unicode Character Number	Full Unicode Name
⿰	U+2FF0	left to right
⿱	U+2FF1	above to below
⿲	U+2FF2	left to middle and right
⿳	U+2FF3	above to middle and below
⿴	U+2FF4	full surround
⿵	U+2FF5	surround from above
⿶	U+2FF6	surround from below
⿷	U+2FF7	surround from left
⿸	U+2FF8	surround from upper left
⿹	U+2FF9	surround from upper right
⿺	U+2FFA	surround from lower left
⿻	U+2FFB	overlaid

https://www.unicode.org/charts/PDF/U2FF0.pdf

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Variant Ideographs

- Example of Unicode IDS
  - https://組字.意傳.台灣/

Variant Ideographs

- Example of Unicode IDS(Korean)
  - Mixed Ideographs(Hanja/ 한자 / 漢字）
    - ⿱石乙 ＝ 乭
  - Mixed Ideographs and Hangul Jamo
    - ⿰加ㅇ ＝ 끙
  - Mixed Ideographs and Hangul Syllable
    - ⿱口도

https://twitter.com/ursaqita/status/897102713007120384

FLOSS in North Korea

- Despite of Economical Sanctions, North Korea's Agency and Research Center uses Open Source Software

  - ex) Red Star OS (Linux, KDE-based Distributed Edition)

FLOSS in North Korea

- North Korea's Linux Distribution, "Red Star OS"(붉은별 리눅스) & 서광사무처리 (Seogwang Office Suite)
  - It developed by the Korea Computer Center (KCC, 조선콤퓨터쎈터 [朝鮮콤퓨터쎈터]→ 조선콤퓨터중심 [朝鮮콤퓨터中心]).
    - administers the .kp country code top-level domain
    - North Korea Information Technology Research Center
  - Computer science in the DPRK
    https://www.northkoreatech.org/2015/01/02/computer-science-in-the-dprk/

FLOSS in North Korea

- In North Korea, North Korea made Android Smartphone is released. (Both S/W and H/W, Maybe, Censorship?)
  - North Korea's WiFi story: the "Mirae" is today
    https://www.northkoreatech.org/2018/12/05/north-korea-mirae-wifi-service/
  - Daeyang 8321 on Korean Central Television
    https://www.youtube.com/watch?v=FsDz1aV-O3Q
  - 북한 최신 스마트폰 '평양 2423' 리 - 뷰
    https://www.youtube.com/watch?v=_83kL7S2FiY
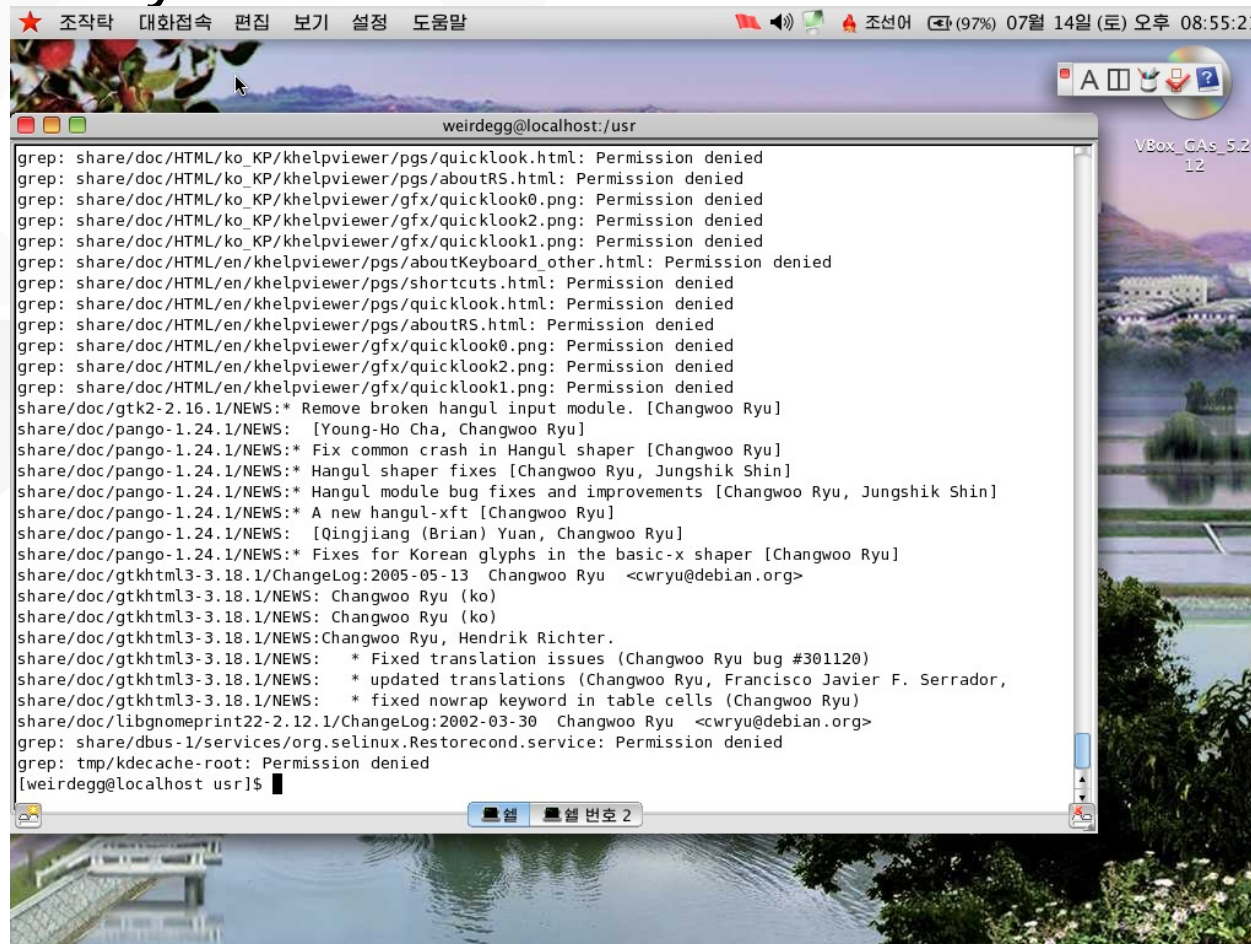
Red Star OS

- North Korea's Linux Distribution.

- KDE Based GUI, Office Suites based on openOffice, etc.

LibreOffice
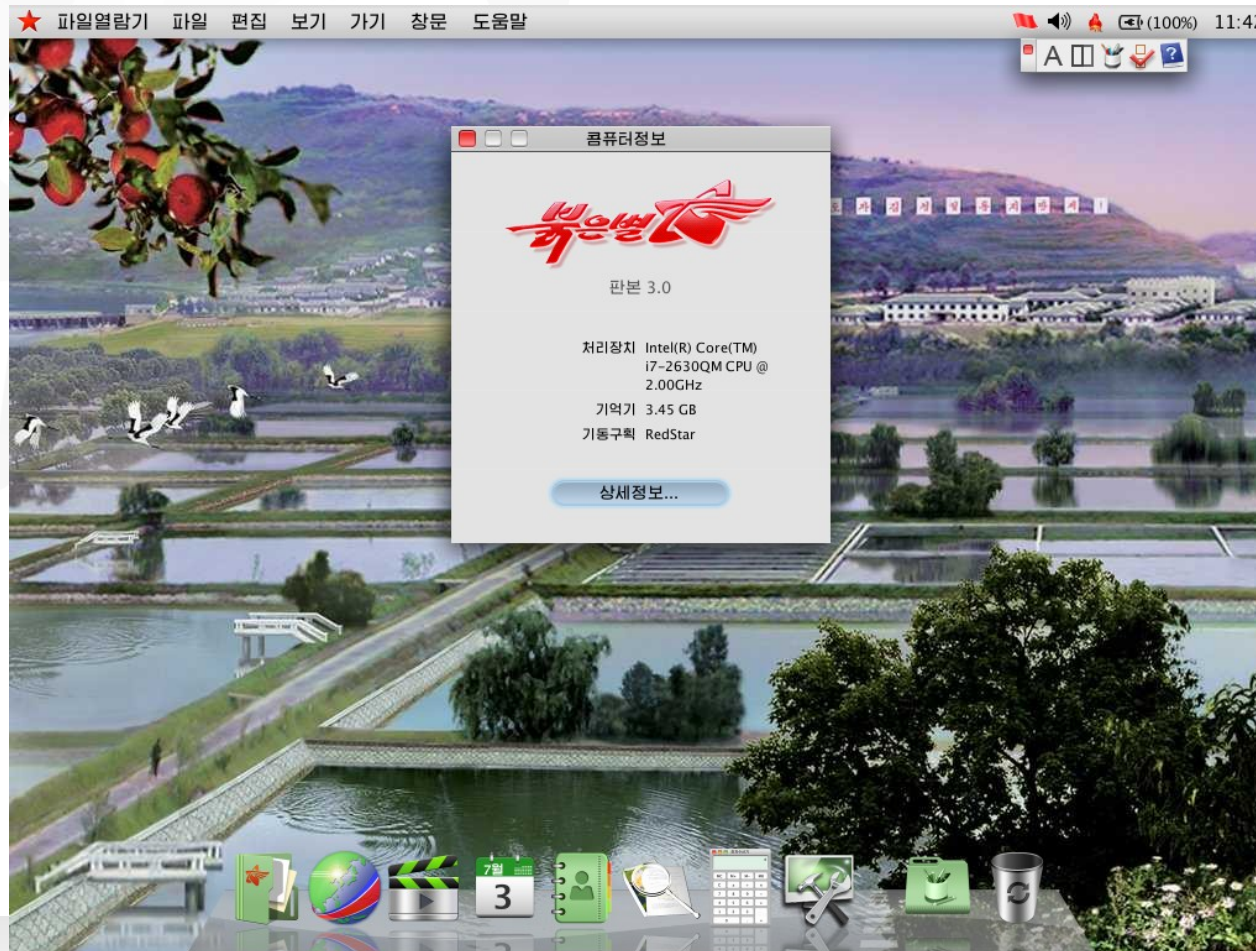
Red Star OS

- Example of The found that used some contents contributed by South Korean contributors
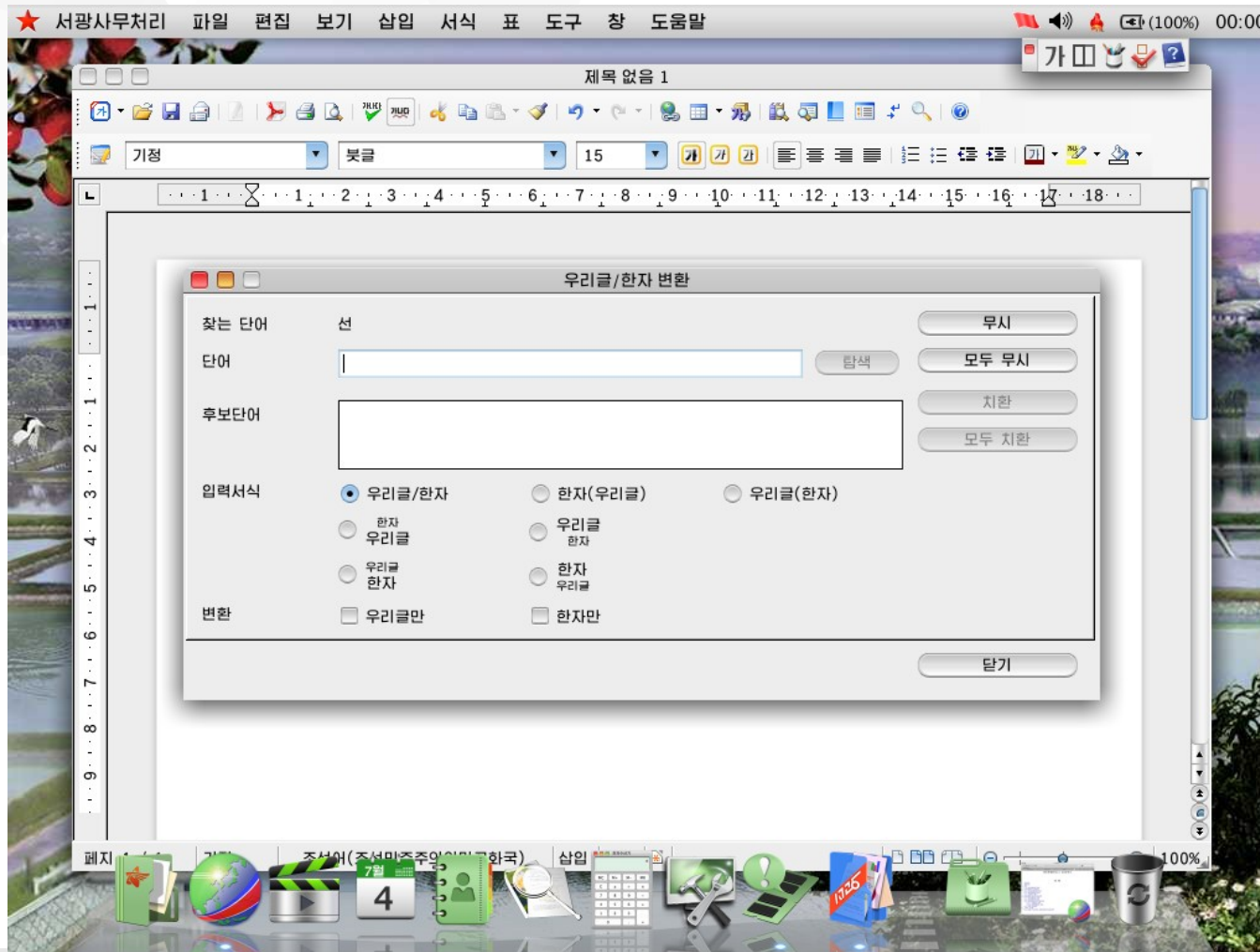
서광사무처리 (Seogwang Office Suite)

It based on openOffice suite.
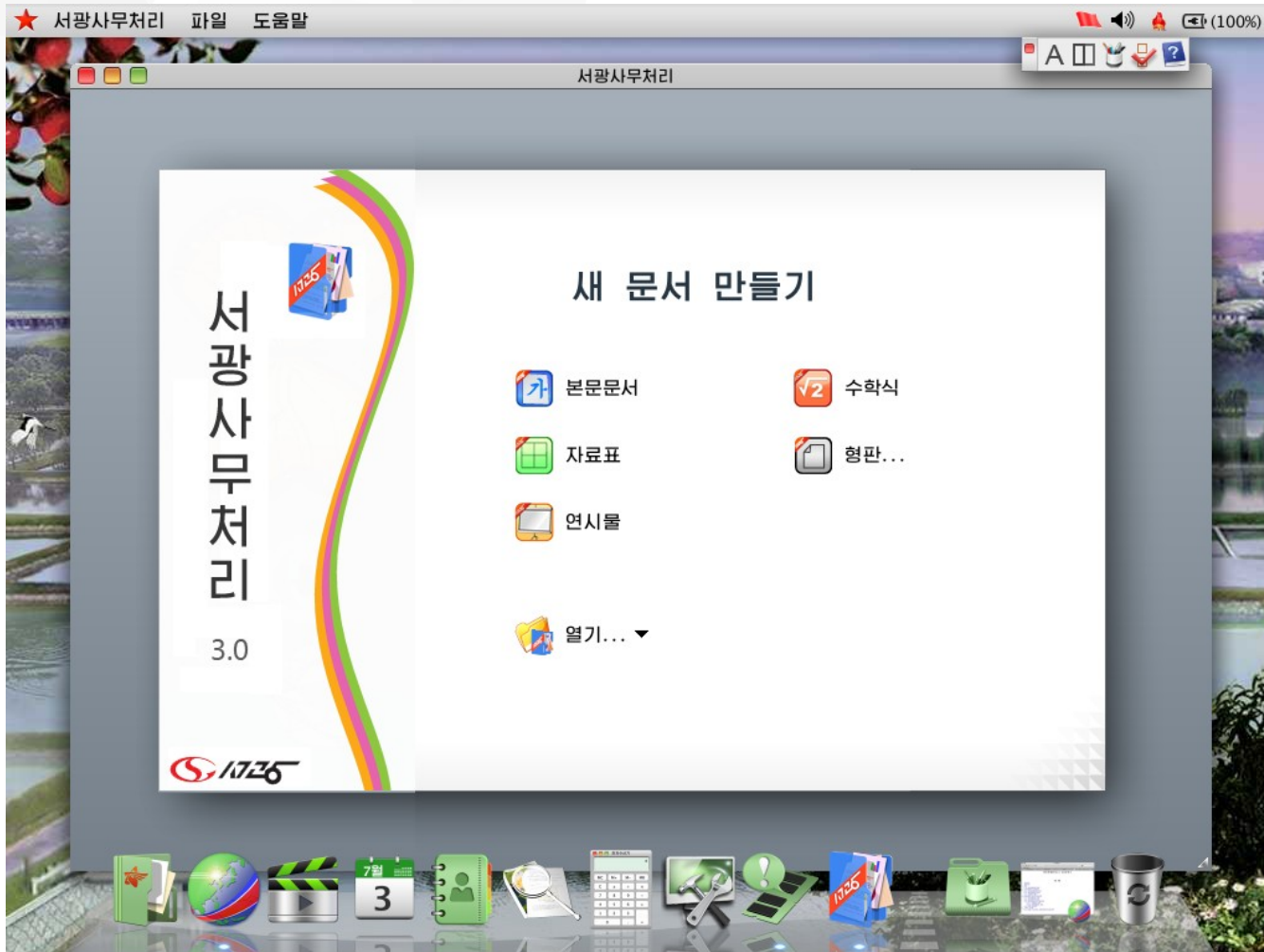
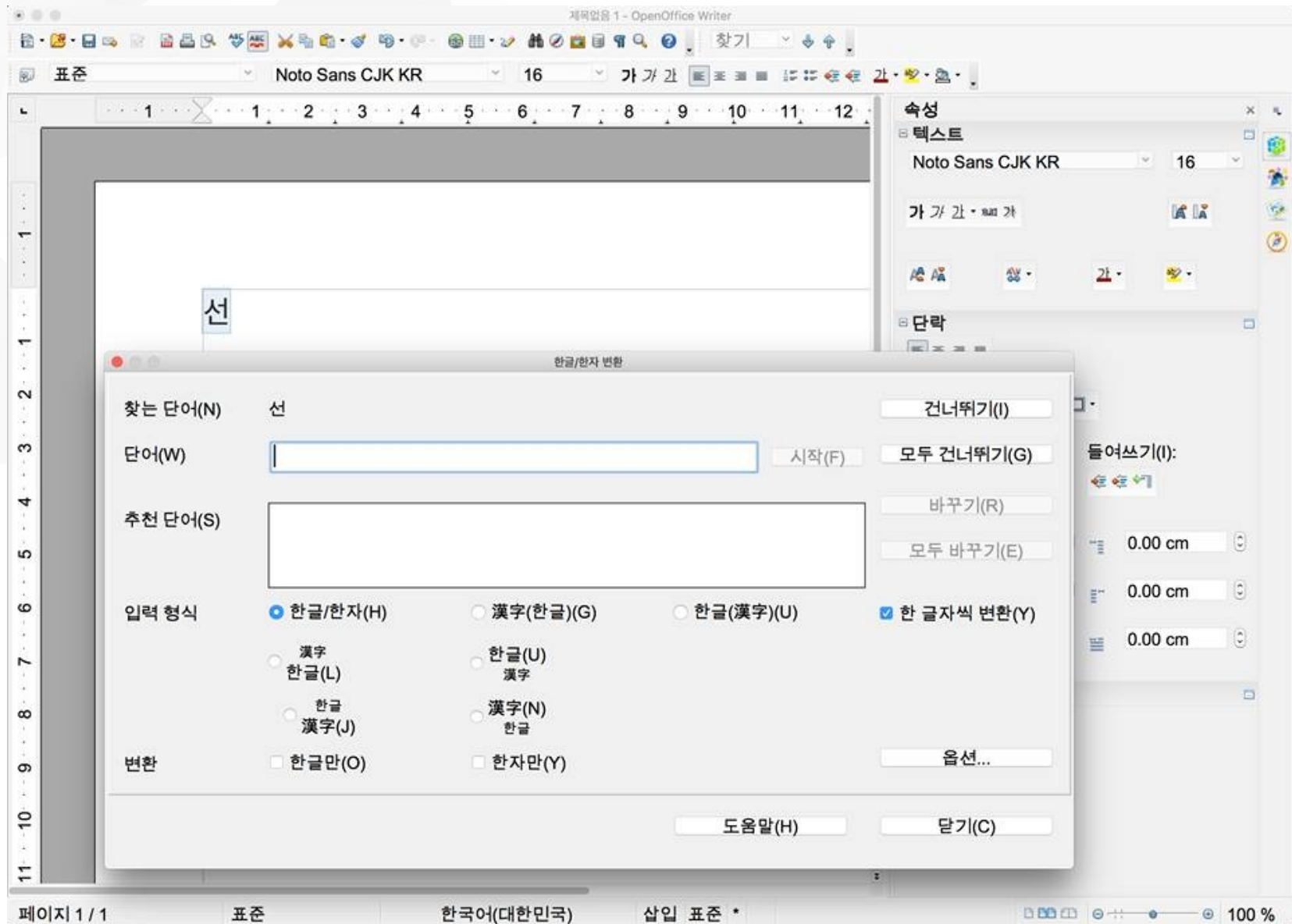# 서광사무처리 (Seogwang Office Suite)

- **Korean Hanja Bug**

Open Office's Korean Hanja Bug

Fixed the LibreOffice Korean Hanja Bug

https://gerrit.libreoffice.org/#/c/54562/
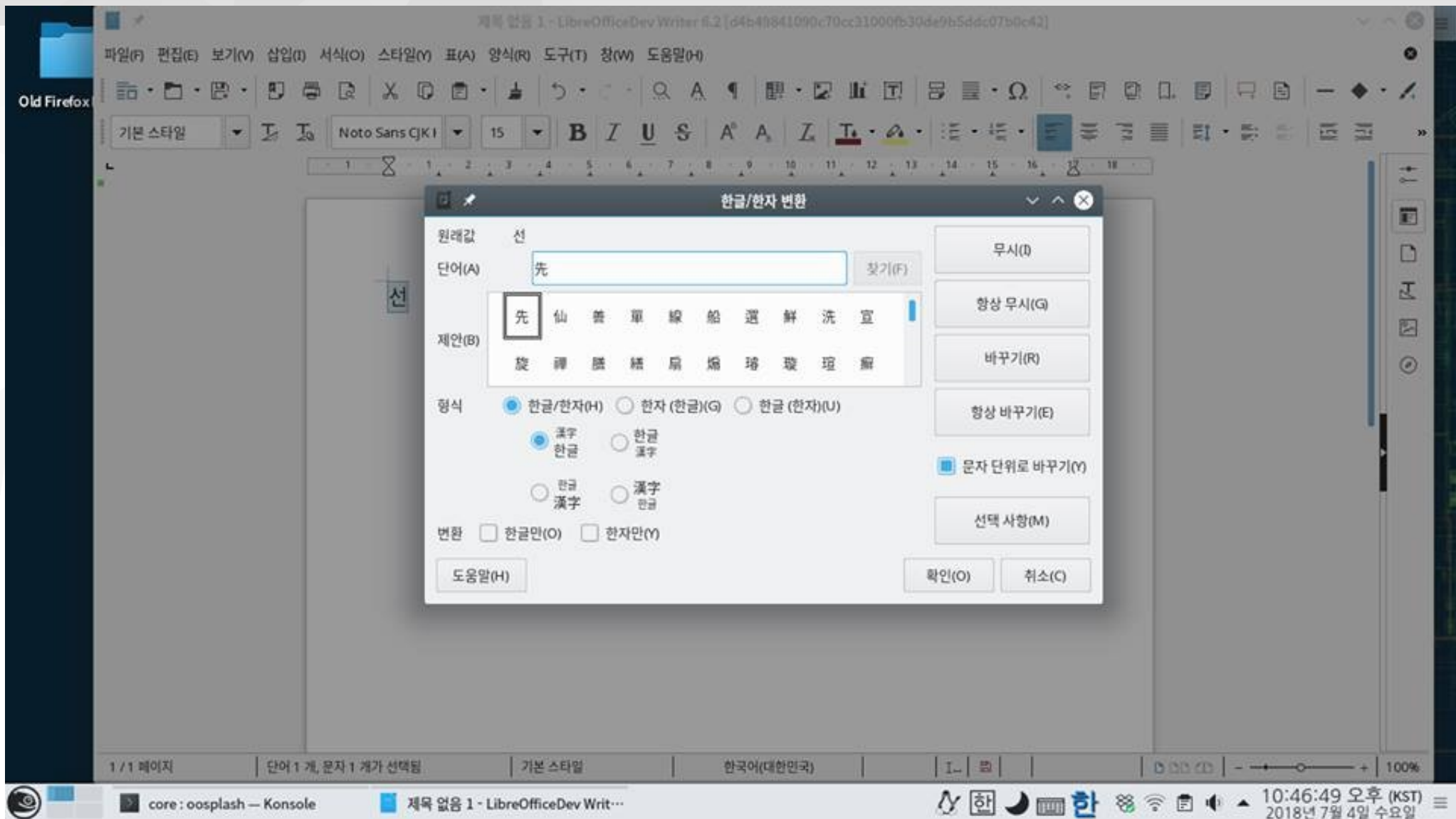
Q&A

- 질의응답 (質疑應答)
- 問與答 / 问与答

References

- CJKV Information Processing 2nd Edition – Ken Lunde
- 日本・中国・台湾・香港・韓国の常用漢字と漢字コード - 安岡孝一 (Koichi Yasuoka)・安岡素子 (Motoko Yasuoka)
  - http://kanji.zinbun.kyoto-u.ac.jp/~yasuoka/publications/UAKIS2017-03-03.pdf
- 韓国の人名用漢字と漢字コード - 安岡孝一 (Koichi Yasuoka)
  - http://kanji.zinbun.kyoto-u.ac.jp/~yasuoka/publications/diccs2016.pdf
- Implementing Cross-Locale CJKV Code Conversion - Ken Lunde
  - https://unicode.org/iuc/iuc13/c2/slides.pdf

References

- Requirements for Hangul Text Layout and Typography(한국어 텍스트 레이아웃 및 타이포그래피를 위한 요구사항)
  - https://www.w3.org/TR/klreq/
- North Korea Tech 노스코리아 테크
  - https://www.northkoreatech.org/
- IVD/IVS とは - IPA 文字情報基盤整備事業
  - https://mojikiban.ipa.go.jp/1292.html
- 中華民國教育部 異體字字典 Dictionary of Chinese Character Variants
  - http://dict.variants.moe.edu.tw/variants/rbt/home.do

References

- ㄇㄅ，都 2017 了注音還沒搞定嗎？ - 董福興
  - https://www.youtube.com/watch?v=4eOFAwy8f7Q

- 2017 還再缺字， Unicode 不是年年更新嗎？ - 張正一
  - https://www.slideshare.net/MGdesigner/2017unicode

- The Localization (CJK) Challenges and Possibilities in Taiwan - 曾政嘉 Cheng-Chia Tseng
  - https://libocon.org/assets/Conference/Rome/Slides/2017-10-11-CJK-Taiwan-challenges-and-possibilities-ChengChia-Tseng.pdf

- Statue of CJK Issues of LibreOffice 2018 Edition - Shinji Enoki 榎 真治
  - https://libocon.org/assets/Conference/Tirana/shinjienoki.pdf

References

- KDE aKademy 2018 - Keynote: Mapping Crimes Against Humanity in North Korea with FOSS - Dan Bielefeld
  - https://conf.kde.org/en/Akademy2018/public/events/78
- Adobe CJK Type Blog - CJK Fonts, Character Sets & Encodings. All CJK.
  - https://blogs.adobe.com/CCJKType/

Thank you …

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