

IMPE $\text{\LaTeX}$ System

Canonical Multilingual and Feature Showcase

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v1.0.1

Abstract

This document is the canonical visual specimen for the current IMPE $\text{\LaTeX}$ System public interface. It combines a local-family style audit, a deliberately small Unicode-range routing regression, dense multilingual paragraph composition with explicit local overrides, right-to-left text, vertical writing, generic complex shaping, CJK and Han family selection, and the principal document features provided by IMPE. It is intended both as a public showcase and as a release-time visual regression specimen.¹

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¹The showcase is intentionally broader than the focused regression fixtures under `tests/`; those fixtures isolate individual failures.

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1 Local Font Families and Styles

This section presents IMPE’s explicit local font commands and compares their available serif, bold, italic, and sans-serif styles. The complete font-family matrix appears on the following landscape page. Where a requested face is unavailable, IMPE falls back according to the family configuration rather than requiring special-case markup.

2 Multilingual Routing and Mixed-Script Composition

Multilingual composition (combined routing and local overrides) is tested here in two deliberately different ways. The main specimen is a dense paragraph in which explicit local families, right-to-left runs, complex shaping, shared Han choices, and inline vertical writing are allowed to interact. A later compact regression enables automatic Unicode-range ownership for only a small set of ordinary scripts.

2.1 Mixed-Script Paragraph

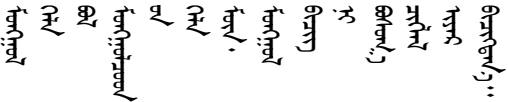
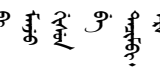
The following specimen is intentionally one $\text{\TeX}$ paragraph. It contains no English transition sentences: every script that appears contributes a complete sentence or clause. Armenian, Georgian, Coptic, Glagolitic, and Tamil are left as raw Unicode to exercise the small automatic-routing set; all other script families in the paragraph use explicit local overrides.

[illegible]

Family	Command	Regular	Bold	Italic	Bold italic	Sans	Sans bold	Sans italic	Sans bold italic
Latin and general-purpose families									
Noto	\NOT	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>
Times	\TIM	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>
Gentium Plus	\GEN	Ārya ṛ ṁ ḥ	Ārya ṛ ṁ ḥ	<i>Ārya ṛ ṁ ḥ</i>	<i>Ārya ṛ ṁ ḥ</i>	Ārya ṛ ṁ ḥ	Ārya ṛ ṁ ḥ	<i>Ārya ṛ ṁ ḥ</i>	<i>Ārya ṛ ṁ ḥ</i>
Charis SIL	\CHA	Ārya ṛ ṁ ḥ	Ārya ṛ ṁ ḥ	<i>Ārya ṛ ṁ ḥ</i>	<i>Ārya ṛ ṁ ḥ</i>	Ārya ṛ ṁ ḥ	Ārya ṛ ṁ ḥ	<i>Ārya ṛ ṁ ḥ</i>	<i>Ārya ṛ ṁ ḥ</i>
Libertinus	\LIB	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>	Abg fi fl	Abg fi fl	<i>Abg fi fl</i>	<i>Abg fi fl</i>
European and ancient alphabetic scripts									
Carian	\CA	ΑΒΝ	ΑΒΝ	ΑΒΝ	ΑΒΝ	ΑΒΝ	ΑΒΝ	ΑΒΝ	ΑΒΝ
Coptic	\CO	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ	Ⲛⲟⲩⲧⲉ
Bopomofo	\ZY	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ	ㄗ ㄨ ˊ ㄣ
Cuneiform	\CU	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶	𐎶𐎵𐎶𐎶
Glagolitic	\GL	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ	ⱭⱭⱭⱭ
Old Italic	\OI	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇	𐌃𐌆𐌇
Old Hungarian	\OH	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ	ꞤꞤꞤ
Runic	\RU	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ	ᚱᚿᚱ
South and Central Asian scripts									
Armenian	\HY	Հայերեն	Հայերեն	Հայերեն	Հայերեն	Հայերեն	Հայերեն	Հայերեն	Հայերեն
Hindi	\HI	हिन्दी	हिन्दी	हिन्दी	हिन्दी	हिन्दी	हिन्दी	हिन्दी	हिन्दी
Sanskrit	\SA	संस्कृतम्	संस्कृतम्	संस्कृतम्	संस्कृतम्	संस्कृतम्	संस्कृतम्	संस्कृतम्	संस्कृतम्
Devanagari	\DEV	देवनागरी	देवनागरी	देवनागरी	देवनागरी	देवनागरी	देवनागरी	देवनागरी	देवनागरी
Tamil	\TA	தமிழ்	தமிழ்	தமிழ்	தமிழ்	தமிழ்	தமிழ்	தமிழ்	தமிழ்
Brahmi	\BR	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓	𑀧𑁆𑀭𑀸𑀓
Georgian	\KA	ქართული	ქართული	ქართული	ქართული	ქართული	ქართული	ქართული	ქართული

[illegible]

Family	Command	Regular	Bold	Italic	Bold italic	Sans	Sans bold	Sans italic	Sans bold italic
WenJin	\WJ	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇	中國𠂇𠂇
Korean	\KR	한국어漢字	한국어漢字	한국어漢字	한국어漢字	한국어漢字	한국어漢字	한국어漢字	한국어漢字
Tangut	\TG	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮	𐞪𐞹𐞮
Mongolian-family and other Asian scripts									
Khitan Small Script (linear)	\KHS	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏
Mongolian	\MO	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ
Mongolian Baiti	\MOb	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ	ᠮᠣᠩᠭᠣᠯᠠᠨ
Manchu	\MC	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ	ᠮᠠᠨᠴᡠ
Segoe Historic	\SEG	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ	ᠮᠤᠩᠭᠣᠯᠠᠨ
Thai	\TH	ภาษาไทย	ภาษาไทย	ภาษาไทย	ภาษาไทย	ภาษาไทย	ภาษาไทย	ภาษาไทย	ภาษาไทย
Old Turkic	\OT	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏
Old Uyghur	\UY	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏	𐰆𐰪𐰏
Vietnamese									
Quốc Ngữ	\VI	Tiếng Việt	Tiếng Việt	Tiếng Việt	Tiếng Việt	Tiếng Việt	Tiếng Việt	Tiếng Việt	Tiếng Việt
Hán-Nôm	\HN	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚	𐶏𐶎𐶛𐶚

前後不同文種保持在同一個段落中。  縦書き
 のモンゴル文字の直後にも日本語の完全な文章が続き、通常の横書き状態が回復したことを確認します。  두 번째 세로쓰기 구간 뒤에도 한국어의 완전한 문장이 이어지며 문단의 방향과 글꼴 상태가 정상적으로 복원되는지를 확인합니다. 最後這個中文完整句子仍然留在同一個段落裡，用來確認兩次豎排 local override、數次 RTL 切換與複雜 shaping 之後，普通橫排行文與局部字體狀態全部恢復正常。

2.2 Minimal Automatic Unicode-Range Regression

Unicode-range routing (automatic font ownership) is exercised here only on a small representative set. This keeps the v1.0.1 showcase focused on routing correctness without turning the entire document into a large interchar transition graph. The specimen itself contains raw Unicode only.

Հայերեն այս ամբողջական նախադասությունը գրված է առանց տեղական տառատեսակի հրամանի: ეს სრული ქართული წინადადება ავტომატური Unicode დიაპაზონის მარშრუტიზაციას ამოწმებს. ΟΥΟΖ ΠΙΛΟΓΟΣ ΑΓΓΥΑΠΙ ΝΟΥΣΑΡΞ ΟΥΟΖ ΑΓΓΥΑΠΙ ΝΗΗΤΕΝ. ீூ Pூூூூூ ூூூூ ூூூூூ, ூ ூூூூூ ூூூூ ூூ ூூூ. தமிழில் எழுதப்பட்ட இந்த முழு வாக்கியம் தனி local font command இன்றி Unicode range owner மூலம் அமைக்கப்படுகிறது.

3 Right-to-Left Scripts

Right-to-left text (directional behavior) requires more than choosing a glyph source. This section therefore uses explicit local families throughout. Each specimen is long enough to form a genuine paragraph, allowing line breaking, inter-word spacing, punctuation, digits, bidirectional interaction, and OpenType shaping to be inspected without enabling overlapping automatic Arabic, Hebrew, or Syriac range owners.

3.1 Arabic

اَلْعَرَبِيَّةُ لُغَةٌ ذَاتُ تَارِيخٍ طَوِيلٍ، وَهِيَ تُكْتَبُ مِنَ الْيَمِينِ إِلَى الْبَسَارِ، وَتَتَّصِلُ حُرُوفُهَا بِأَشْكَالٍ مُخْتَلِفَةٍ بِحَسَبِ مَوْضِعِهَا فِي الْكَلِمَةِ. يَحْتَوِي هَذَا النَّصُّ عَلَى جُمْلٍ طَوِيلَةٍ وَعَلَامَاتٍ تَرْقِيمٍ مُتَنَوِّعَةٍ، وَتَتَغَيَّرُ أَطْوَالُ الْكَلِمَاتِ وَالْجُمْلِ حَتَّى يَظْهَرَ سُلُوكُ الْفَقْرَةِ عِنْدَ نِهَآيَةِ السَّطْرِ. وَعِنْدَمَا يَطْوُلُ السَّطْرُ يَجِبُ أَنْ يَنْتَقِلَ النَّصُّ إِلَى السَّطْرِ التَّالِي بِصُورَةٍ طَبِيعِيَّةٍ مِنْ غَيْرِ أَنْ تَنْقَطِعَ أَشْكَالُ الْحُرُوفِ أَوْ تَضْطَرِّبَ الْمَسَافَاتُ بَيْنَ الْكَلِمَاتِ. وَيُسْتَعْمَلُ هَذَا الْمَقْطَعُ لِلتَّأَكُّدِ مِنْ

Inline Arabic inside an English sentence: الترقيم في سطر واحد مع علامات الترقيم before returning to ordinary Latin text.

اُردو ایک ایسی زبان ہے جس کی تحریری روایت میں نستعلیق رسم الخط کو خاص اہمیت حاصل ہے۔ اس رسم الخط میں حروف صرف ایک دوسرے سے ملتے ہی نہیں بلکہ الفاظ کی مجموعی ساخت بھی سطر کی بصری صورت پر اثر ڈالتی ہے، اس لیے طویل عبارت مختصر نمونے سے کہیں زیادہ مفید آزمائش فراہم کرتی ہے۔ اس پیراگراف میں مختلف لمبائی کے الفاظ، مختلف رموزِ اوقاف، اور کئی مسلسل جملے شامل ہیں تاکہ دائیں سے بائیں بہاؤ، لفظی فاصلوں، اور سطر کے اختتام پر عبارت کی تقسیم کو واضح طور پر دیکھا جاسکے۔ جب عبارت ایک سطر میں پوری نہ آئے تو اگلی سطر میں منتقلی قدرتی ہونی چاہیے، الفاظ کی ترتیب برقرار رہنی چاہیے، اور نستعلیق کی تشکیل کسی غلط فونٹ یا غیر متعلقہ عربی طرز میں تبدیل نہیں ہونی چاہیے۔ یہ آخری جملہ خاص طور پر اس بات کی جانچ کرتا ہے کہ ایک مکمل اُردو پیراگراف کئی سطروں میں تقسیم ہونے کے بعد بھی اپنی مقامی نستعلیق فیملی اور درست سمت برقرار رکھتا ہے۔

העברית נכתבת מימין לשמאל, ולכן פסקה ארוכה מאפשרת לבדוק לא רק את צורת האותיות אלא גם את התנהגות השורות, הרווחים וסימני הפיסוק. בטקסט הזה מופיעים משפטים באורכים שונים כדי לבדוק כיצד המערכת מתמודדת עם רצף עברי ארוך בתוך פסקה רגילה. כאשר השורה נעשית ארוכה מדי, המעבר לשורה הבאה צריך להתרחש במקום טבעי בלי לשנות את סדר המילים ובלי לפגוע במיקום הנקודות, הפסיקים והסוגריים. אפשר גם לכתוב מילים מנוקדות כמו שָׁלוֹם, עֵבְרִית וְכֵתִיבָה בתוך אותה פסקה, וכך לבדוק שהניקוד נשאר מחובר לאות הנכונה גם לאחר שבירת שורה. המשפט האחרון נועד לוודא שהפסקה כולה נשארת יציבה בתוך מסמך רב־לשוני ולאחריה חוזר הטקסט הסובב להתנהגות הרגילה.

1. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 2. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 3. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 4. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 5. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 6. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 7. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 8. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 9. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.
 10. **התאמה:** התאמה בין המצב הנוכחי לבין המצב הרצוי.

Eastern Syriac stylistic family:

[illegible]

Vertical writing (horizontal-layout-compatible vertical embedding) is currently implemented as a compatibility mode inside an otherwise horizontal document layout. IMPE does not yet provide a fully vertical page or paragraph flow. Instead, the text is divided at word boundaries, and each word is typeset vertically while the resulting word-sized units continue to participate in ordinary horizontal paragraph layout. Spaces therefore become natural break opportunities between vertical words.

This design keeps genuinely vertical glyph orientation while allowing the text to wrap within normal horizontal pages, with relatively compact line spacing and without requiring a separate vertical document model. The specimens below are deliberately long enough to test this compatibility strategy under realistic paragraph conditions: word segmentation, inter-word spacing, line breaking, line spacing, punctuation, ordering, and recovery of the surrounding horizontal layout.

Horizontal

1. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 2. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 3. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 4. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 5. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 6. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 7. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 8. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 9. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝
 10. Ինչպե՞ս կարող եմ օգտագործել Ձեր օգնությունը՝

Vertical

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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4.2 Manchu

Horizontal

ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ
 ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ
 ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ
 ᡤᡠᡵᡠ ᡤᡠᡵᡠ

Vertical

ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ
 ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ
 ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ ᡤᡠᡵᡠ

4.3 Old Uyghur

The Old Uyghur sample is deliberately extended so that several successive vertical columns must be produced. It is used as a layout stress string rather than as a continuous philological quotation.

Horizontal

ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ
 ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ
 ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ

Vertical

ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ
 ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ ᲙᲗᲚᲙ

5 Complex Shaping and Stacked Sequences

OpenType shaping (generic complex shaping) is tested here through explicit local families. This deliberately separates shaping from Unicode-range ownership: if a local specimen is wrong, the failure belongs to the selected family or shaping path rather than to an automatic range transition. Egyptian Hieroglyphs remain outside this showcase, and Khitan Small Script is recorded only in its current linear fallback form.

5.1 Devanagari

The Sanskrit local family exercises conjuncts, virama behavior, pre-base and post-base vowel signs, and longer clusters without enabling a document-wide Devanagari owner.

A longer local specimen:

धर्मक्षेत्रे कुरुक्षेत्रे समवेता युयुत्सवः । संस्कृतवाक्यानि देवनागर्या लिखितानि सन्ति ।

Table 2: Devanagari shaping specimens

Sequence	Specimen
kṣa	क्ष
jña	ज्ञ
śra	श्र
stra	स्त्र
ddhya	द्ध्य
dharma	धर्म
dharmakṣetre	धर्मक्षेत्रे
saṃskṛtam	संस्कृतम्
om	ॐ

5.2 Tibetan

Tibetan provides a visible example of generic vertical stacking inside one local shaping run.

Table 3: Tibetan stack specimens

Type	Specimen
stack	བསྐྱབས་
stack	བརྒྱད་
stack	བཟླ་
stack	རྒྱལ་
stack	དབྱངས་

A longer local paragraph exercises Tibetan shaping and line breaking under ordinary document width:

བོད་ཡིག་ནི་བོད་ཀྱི་སྐད་ཡིག་འབྲི་བའི་ཡི་གེའི་མ་ལག་ཅིག་ཡིན་ཞིང་། ཆོག་དང་ཆོག་གི་བར་ལ་ཆོག་གིས་
མཚམས་འབྲེད་པ་དང་། ཡི་གེ་མང་པོ་ཞིག་མགོ་ཅན་དང་འདྲེན་ཅན་དུ་སྒྱུར་ནས་ཆོག་བར་གཅིག་གི་ནང་དུ་སྦྱངས་ཏེ་
འབྲི་དགོས། དཔེར་ན་བསྐྱབས་པ་དང་། བརྒྱད་པ། བཟླ་པ། རྒྱལ་ཁབ། དབྱངས་ཅན་ལྟ་བུའི་ཆོག་ནང་དུ་ཡི་གེ་མང་པོ་
སྒྱུར་ཡོད་པས། ཡིག་གཟུགས་ཀྱི་སྦྱངས་སྦྲངས་དང་ཆོག་བར་གྱི་བར་ཐག་གཉིས་ཀ་ཡང་དག་པར་སྟོན་དགོས། ཆོག་ཕྱིང་
རིང་པོ་ཞིག་ཤོག་ངོས་ཀྱི་ཞིང་ཆད་ལས་བཀལ་བའི་སྐབས་སུ། ཆོག་གི་རྗེས་སུ་རང་བཞིན་གྱིས་ཕྱིང་བ་གསར་པར་འགོ་
ཐུབ་པ་དང་། སྔ་ཕྱིའི་ཡི་གེའི་སྦྱངས་སྦྲངས་དང་ཆོག་གི་གོ་རིམ་མི་འབྲུག་པ་གལ་ཆེ། དེའི་ཕྱིར་ཆོག་ཕྱིང་རིང་པོ་འདིས་
བོད་ཡིག་གི་གཟུགས་སྟོར་དང་། ཆོག་བར། ཕྱིང་བར། ཤད་དང་ཉིས་ཤད་ཀྱི་གནས་སྦྲངས། དེ་བཞིན་དུ་ཕྱིང་བ་བརྗེ་བའི་
སྐབས་ཀྱི་སྤྱིའི་སྒྲིག་སྦྲངས་བཅས་ལ་ཆོད་ལྟ་བུའི་ཐུབ།

The specimens in this section therefore use normal-width continuous text rather than isolated character strings. They exercise paragraph composition, line breaking, punctuation, regional glyph forms, Hangul composition, historical jamo, supplementary-plane ideographs, and mixed-script runs. A compact table at the end isolates shared Han codepoints for direct visual comparison.

6.1 Chinese

Mainland Simplified Chinese — Noto SC This paragraph uses the explicit Simplified Chinese family throughout.

现代中文排版并不只是把一个个汉字依次放进页面。一个真正的正文环境还需要同时处理标点、数字、书名号、引号、括号以及连续句子之间的换行关系，并且在较长的段落中保持稳定的字面和行距。对于共享的汉字码位，不同地区使用的字体还可能给出不同的字形，因此同一个“骨、直、令、具、角”在不同字体家族中会表现出细微而稳定的区域差异。这里使用一整段连续的简体中文来检查大陆简体字形、标点悬挂附近的布局、正常段落换行以及本地字体选择在长文本中是否能够始终保持有效，而不是只验证几个孤立字符能不能显示。

Mainland Traditional Chinese — Noto SC Traditional characters can also be deliberately typeset through the Mainland Chinese family. This separates character repertoire from regional glyph selection: traditional codepoints do not by themselves imply a Taiwan or Hong Kong font.

现代中文排版并不只是把一个个汉字依次放进页面。一个真正的正文环境还需要同时处理标点、数字、书名号、引号、括号以及连续句子之间的换行关系，并且在较长的段落中保持稳定的字面和行距。对于共享的汉字码位，不同地区使用的字体还可能给出不同的字形，因此同一个「骨、直、令、具、角」在不同字体家族中会表现出细微而稳定的区域差异。这里特意使用传统汉字而仍然选择大陆字体家族，以检查字符繁简与地域字形选择能否保持彼此独立，并观察长段落中共享汉字、繁体字和全角标点的连续排版。

Taiwan Traditional Chinese — Noto TC The Taiwan family is tested with continuous Taiwan Traditional Chinese rather than with a short regional-glyph sample.

正體中文的正文排版除了字符本身之外，也牽涉字型、標點、行距與段落節奏。當文件同時包含不同語言或不同地區的漢字時，程式不能僅依 Unicode 碼位猜測應採用哪一套地區字形，而應由明確的語言或字型選擇來決定。這個段落使用臺灣正體字型，

並刻意包含「骨、直、令、具、角、門、國、學、龍」等適合觀察地區字形差異的共享漢字，同時加入引號、頓號、逗號與句號，藉此確認較長的正體中文內容在正常欄寬中能自然換行，而且從段首到段末始終維持同一個本地 CJK family。

Document Traditional Chinese – Shanggu The following paragraph is deliberately left completely unwrapped. It therefore remains under the document CJK family, Shanggu, and provides the control against which the explicit Chinese, Japanese, and Korean families can be compared.

漢字進入現代數位排版之後，同一個編碼往往可以由許多不同的字體呈現，而字形的歷史層次、地域習慣和設計風格並不會因此消失。傳統中文尤其適合用來觀察這種情形：有些字在不同地區的正文中結構略異，有些字的筆形和部件位置不同，而另一些差別只有在一整段文字的灰度與節奏中才會顯現。這個段落不使用任何語言專用命令，使所有漢字直接落入文件的 Shanggu CJK family；因此它不只是檢查單字是否存在，也檢查文件級 CJK 選擇在較長的連續文本、標點和自動換行之間能否穩定維持。

6.2 Korean and Historical Hangul

Modern Korean – Hangul The first Korean specimen deliberately avoids Hanja. It tests ordinary modern Hangul composition, punctuation, word spacing, and paragraph wrapping.

한글로 쓰인 긴 문장은 여러 음절 블록이 끊임없이 이어지면서도 낱말 사이의 간격과 문장 부호의 위치가 자연스럽게 유지되어야 한다. 짧은 보기에서는 글꼴이 몇 글자를 제대로 보여 주는지만 확인할 수 있지만, 실제 문단에서는 줄 끝에서 낱말이 어떻게 배치되는지, 괄호와 따옴표가 앞뒤 글자와 어떻게 어울리는지, 여러 줄을 지나도 같은 글꼴 선택이 계속 유지되는지를 함께 살펴볼 수 있다. 이 문단은 완성형 한글이 이어지는 일반적인 한국어 본문을 충분히 길게 배치하여 문장 전체의 모양과 줄 간격을 확인하고, 뒤에 나오는 한자 혼용문과 옛한글 자료를 비교하기 위한 현대 한글 기준 표본으로 사용한다.

Modern Korean – mixed Hanja and Hangul The next paragraph keeps Hangul and Hanja inside a single explicit Korean family. Shared Han characters must therefore retain Korean regional forms without interrupting the surrounding Hangul text.

韓國語의 現代 文體는 오늘날 대체로 한글만으로 적지만, 歷史、言語、哲學、法律과 같은 분야에서는 漢字를 함께 적은 문헌을 어렵지 않게 만날 수 있다. 이런 漢字混用文을 조판할 때에는 한글 音節과 句讀點 사이에 들어가는 漢字가 갑자기 다른 地域 字形으로 바뀌지 않아야 하며, 韓國、朝鮮、漢字、文化、文字와 같은 어휘도 앞뒤의 한글 문맥과 한 family 안에서 자연스럽게 이어져야 한다. 이 문단은 國語의 읽기 흐름을 유지하면서 여

러 漢字語와 고유어를 섞어, 실제 문헌에서 볼 수 있는 긴 혼용문이 줄바꿈을 거처도 안정적으로 조판되는지를 시험한다.

Jeju language — corpus specimen Jeju is useful here because practical orthographies make active use of the arae-a and decomposed Hangul sequences that are rare in ordinary modern Korean. The following is a composite regression specimen assembled from short attested Jeju-language passages rather than a newly invented “standard” Jeju paragraph.

제주말 (濟州말) 은 제주섬서 글아지는 말이다. 제주말모음은 시간 지나명 여러 가지 변화가 이섯다. 제주섬은 한라산광 주깃디 오름덜록 일뤰진 섬이라. 옛적 화산활동으록 굴부리가 께썩 곤데곤데 으라 오름이 하영 샷다. 낭 (木) 은 나무질로 뉘 줄기를 가지고 잇인 여러해살이 식물이다. 제주말 위키백과 또시는 제주어 위키백과는 제주말로 운영험신 위키백과 언어판이라.

Middle Korean and Old Hangul — historical corpus specimen The historical specimen deliberately retains decomposed jamo and tone marks. Rather than normalizing several sources into modern spelling, short genuine historical fragments are placed consecutively to form a paragraph-level shaping regression.

나·랏·말·ㅅ·미·中·듀 。國·국·에 달·아문·쥬·와로서·르·스·뭇·디아·니·힐·썩 ·아기·빅·여·셔·과
굴·이·가·숨·알·파·주·글··뎡··헝·거·든 두·들·젠 開·關·힐·젯·므·리 疏·通·헝·고·남·근 古·今·엿·남·기·섯
것·도·다 머·리·알·포·고·고·히·막·고 머·리·와·눈·괘·환·티·아·니·커·든 ·긔·운·이·우·호·로·울·아
머·리·알·포·미·뽻·리·는 ·뎡·거·든 넓·고·큰 天·造·스·이·에 다·슬·며 어·즈·러·우·민·들 엿·디·덜·덜·헝 數
| 리·오

The corpus paragraph above tests realistic historical material. The following synthetic boundary sequence has a different purpose: it explicitly crosses Hangul Jamo Extended-A, ordinary Jamo, and Extended-B while remaining inside one shaping run.

·맏

Modern decomposed control:

각

6.3 Japanese and Ryukyuan

Modern Japanese Modern Japanese combines kana, regional Han forms, punctuation, and frequent script changes inside the same sentence. The entire paragraph remains under the explicit Japanese family.

現代日本語の文章では、漢字、ひらがな、カタカナが一つの段落の中で何度も切り替わり、句読点や括弧、かぎ括弧も連続して現れる。短い文字列だけではフォントが表示できることしか分からないが、長い本文にすると、漢字と仮名の大きさの釣り合い、約物の位置、行末での折り返し、そして次の行へ移った後の字形の連続性まで確認できる。この段落では「日本語」「漢字」「文字」「学校」「文化」「骨」「直」「令」「具」「角」などを通常の文脈に入れ、日本語用の地域字形を保ったまま複数行の文章が安定して組版されるかを試している。

Historical kana orthography The opening sentence below is historical text; the continuation is a showcase-written regression passage that deliberately retains historical kana spellings such as ゐる, やう, and 言ふ. This keeps the specimen long enough for paragraph testing without presenting newly written material as an archival transcription.

真夏の宿屋は空虚であつた。窓の外には白い雲がゆつくり流れ、庭の木立では蟬が絶えず鳴いてゐる。旅人は古い椅子に腰をおろし、まだ來ない馬車の音を待ちながら、時計の針ばかりを眺めてゐた。誰も何も言はないので、午後の光だけが廊下を少しづつ移つて行くやうに見えた。かうして長い時間が過ぎても、玄關の戸は一度も開かず、遠くの道から聞えて來る物音だけが、時々静かな宿の空氣を動かしてゐるのであつた。

Japanese Kanbun The first sentence is taken from Rai San'yō's *Nihon Gaishi*; the remainder is a showcase-written Kanbun-style regression continuation. The purpose here is typographic: Japanese Han glyphs must remain selected even when no kana occur in the run.

外史氏曰、吾讀舊志、見鳥羽帝時數下制符。蓋日本文章之傳、漢籍之學與國史之記相因而久矣。昔之學者讀經史、作序記、論人物、述治亂、多用漢文而各成其體。今取其字列於一段、所以驗日本字形之連續、句讀之位置、長行之折返、以及共享漢字在無假名介入時亦不離其本地字體也。文字雖同出一碼、而骨直令具角門國學龍諸字之形、隨地域字體而微異、故尤宜以連續文章觀之。

Okinawan — corpus specimen Okinawan is represented by a composite specimen from the Wikimedia Okinawan test project. Its mixed use of kana and Han characters makes it a

useful additional Japanese-family regression, while the orthography should not be read as a claim that one universal Okinawan spelling standard exists.

沖縄口えー琉球諸語ぬてい壺ちやいびーん。うちなーぐちぬ首里那覇方言おー琉球国ぬじょーま言葉やびたん。琉球王國や、昔ジジ中心んかい存在さる王国やたん。王や首里天加那志とう言ん。首里城や、沖縄県ぬ城やん。琉球王朝ぬ王城っし、沖縄県ぬいっちゃん大さるぐしくやん。漢字えー、大昔唐ぬ国んかいそーじー現りーる文字ぬていーちやん。やまとう、高麗、るーちゅー、ベトナムおー、大昔唐ぬ国から漢字伝わていちゃん。

Ainu Ainu written in the modern katakana orthography makes extensive use of Katakana Phonetic Extensions for syllable-final consonants. The following specimen therefore exercises ordinary katakana together with characters such as ク, シ, ム, ラ, and the combining form プ inside continuous text.

イタッブリカ ソモネコロカ シサムモシリ モシリソカワ チヌムケニシパ
チヌムケ カッケマッ ウタペラリワ オカウシケタ クニネネワ アイヌイタッ
アニ クイタクルウェ ネワネヤクン ラモッシワノ クヤイライケプ ネルウェ
タパンナ。エエパキタ カニアナクネ アイヌモシリ シシリムカ ニプタニコタ
ン コアパマカ クネルウェネ ウッチケクニプ ラカサッペ。

6.4 Vietnamese

The same constitutional passage is used throughout this subsection so that the specimens differ primarily in writing system or font selection rather than in linguistic content. Quốc Ngũ is first typeset with the document Latin family, Libertinus, and then with the dedicated Vietnamese family. The corresponding Hán-Nôm text uses the VinaWiki repertoire.

Quốc Ngũ – document Latin family The first specimen is deliberately unwrapped and therefore remains in the document Latin family, Libertinus. It tests Vietnamese diacritics without a language-specific font override.

Trải qua mấy nghìn năm lịch sử, Nhân dân Việt Nam lao động cần cù, sáng tạo, đấu tranh anh dũng để dựng nước và giữ nước, đã hun đúc nên truyền thống yêu nước, đoàn kết, nhân nghĩa, kiên cường, bất khuất và xây dựng nên nền văn hiến Việt Nam. Từ năm 1930, dưới sự lãnh đạo của Đảng Cộng sản Việt Nam do Chủ tịch Hồ Chí Minh sáng lập và rèn luyện, Nhân dân ta tiến hành cuộc đấu tranh lâu dài, đầy gian khổ, hy sinh vì độc lập, tự do của dân tộc, vì hạnh phúc của Nhân dân. Cách mạng tháng Tám thành công, ngày 2 tháng 9 năm 1945, Chủ

Table 5: WenJin CJK block coverage

Block	Range	Twenty-character specimen
CJK Unified Ideographs	U+4E00–U+9FFF	一丁丂七上丅丅万丈三上 下丅丅丅丅丅丅丅丅丅丅
Extension A	U+3400–U+4DBF	止因崑个牛×月𠂔𠂔𠂔𠂔 𠂔𠂔𠂔𠂔𠂔𠂔𠂔𠂔𠂔𠂔
Extension B	U+20000–U+2A6DF	𠀎𠀏𠀐𠀑𠀒𠀓𠀔𠀕𠀖𠀗𠀘𠀙 𠀚𠀛𠀜𠀝𠀞𠀟𠀠𠀡𠀢𠀣𠀤𠀥
Extension C	U+2A700–U+2B73F	𠀦𠀧𠀨𠀩𠀪𠀫𠀬𠀭𠀮𠀯𠀰𠀱 𠀲𠀳𠀴𠀵𠀶𠀷𠀸𠀹𠀺𠀻𠀼𠀽
Extension D	U+2B740–U+2B81F	𠀾𠀿𠄀𠄁𠄂𠄃𠄄𠄅𠄆𠄇𠄈𠄉 𠄊𠄋𠄌𠄍𠄎𠄏𠄐𠄑𠄒𠄓𠄔
Extension E	U+2B820–U+2CEAF	𠄕𠄖𠄗𠄘𠄙𠄚𠄛𠄜𠄝𠄞𠄟 𠄠𠄡𠄢𠄣𠄤𠄥𠄦𠄧𠄨𠄩𠄪
Extension F	U+2CEB0–U+2EBEF	𠄫𠄬𠄭𠄮𠄯𠄰𠄱𠄲𠄳𠄴𠄵 𠄶𠄷𠄸𠄹𠄺𠄻𠄼𠄽𠄾𠄿𠅀
Extension I	U+2EBF0–U+2EE5F	𠅁𠅂𠅃𠅄𠅅𠅆𠅇𠅈𠅉𠅊𠅋 𠅌𠅍𠅎𠅏𠅐𠅑𠅒𠅓𠅔𠅕𠅖
Extension G	U+30000–U+3134F	𠅗𠅘𠅙𠅚𠅛𠅜𠅝𠅞𠅟𠅠𠅡 𠅢𠅣𠅤𠅥𠅦𠅧𠅨𠅩𠅪𠅫𠅬
Extension H	U+31350–U+323AF	𠅭𠅮𠅯𠅰𠅱𠅲𠅳𠅴𠅵𠅶𠅷 𠅸𠅹𠅺𠅻𠅼𠅽𠅾𠅿𠆀𠆁𠆂
Extension J	U+323B0–U+3347F	𠆃𠆄𠆅𠆆𠆇𠆈𠆉𠆊𠆋𠆌𠆍 𠆎𠆏𠆐𠆑𠆒𠆓𠆔𠆕𠆖𠆗𠆘

Table 6: Regional forms of shared Han codepoints

Character	Shanggu	Noto SC	Noto TC	Japanese	Korean
骨	骨	骨	骨	骨	骨
直	直	直	直	直	直
令	令	令	令	令	令
具	具	具	具	具	具
角	角	角	角	角	角
門	門	門	門	門	門
國	國	國	國	國	國
學	學	學	學	學	學
龍	龍	龍	龍	龍	龍

7.1 Mathematics

Mathematical font selection is deliberately left at IMPE's default setting. The following single display combines several common mathematical alphabets, operators, delimiters, accents, matrices, integrals, sums, limits, radicals, and nested scripts as a compact stress specimen.

$$\begin{aligned}
\mathcal{Z}_{\beta,\mu} &:= \text{Tr}_{\mathcal{H}} \exp \left[-\beta \left(\widehat{\mathbf{H}} - \mu \widehat{\mathbf{N}} \right) \right] \\
&= \sum_{n=0}^{\infty} \frac{1}{n!} \int_{\mathbb{R}^{3n}} \prod_{j=1}^n \frac{d^3 \mathbf{p}_j}{(2\pi\hbar)^3} \exp \left[- \sum_{j=1}^n \sqrt{m_j^2 c^4 + c^2 \|\mathbf{p}_j\|^2} \right] \\
&\quad \times \det \left(\begin{array}{ccc} \frac{\partial^2 \mathcal{L}}{\partial q^i \partial q^j} & \nabla_{\mu} F^{\mu\nu} & \langle \psi | \widehat{\mathbf{H}} | \phi \rangle \\ \sum_{k=1}^{\infty} \frac{(-1)^{k+1}}{k^2} & \sqrt[3]{1 + \sqrt{1 + \lambda^2}} & \frac{\mathbb{E}[X^4] - 3\mathbb{E}[X^2]^2}{\text{Var}(X)^2} \\ \oint_{|z|=1} \frac{\log(1+z)}{z^{r+1}} dz & \prod_{p \in \mathbb{P}} (1 - p^{-s})^{-1} & \lim_{\varepsilon \rightarrow 0^+} \frac{f(x+\varepsilon) - f(x-\varepsilon)}{2\varepsilon} \end{array} \right) \\
&\quad + \underbrace{\widetilde{\mathbf{A}}_{\mu}^{\dagger \nu} \overline{\mathbf{B}}_{\nu}^{\rho} \widehat{\mathbf{C}}_{\rho}^{\mu}}_{\text{accented tensor contraction}} + \frac{\Gamma(\frac{1}{2} + i\alpha) \zeta(2s)}{\sqrt{2\pi\sigma^2}} \\
&\quad + \begin{cases} e^{-1/x^2} \sin(\pi/x), & x \neq 0, \\ 0, & x = 0, \end{cases} \\
&\quad \xrightarrow[\alpha \rightarrow 0]{\beta \rightarrow \infty} \left(\bigoplus_{j=1}^r \mathbb{C}^{n_j} \right) \otimes \bigwedge^k V \\
&\quad \implies \mathbb{P}(|X - \mathbb{E}[X]| \geq t) \leq \frac{\text{Var}(X)}{t^2}, \quad t > 0, \\
&\quad \alpha, \beta, \gamma, \delta, \varepsilon, \theta, \vartheta, \lambda, \mu, \nu, \xi, \pi, \varpi, \rho, \varrho, \sigma, \phi, \varphi, \chi, \psi, \omega \in \mathbb{R}.
\end{aligned}$$

7.2 Tables

Table 7 uses the IMPE book-table environment rather than a raw `tabular` wrapper.

7.3 Lists and Example Blocks

A normal list remains ordinary $\text{\LaTeX}$:

1. automatic font ownership;

Table 7: Feature integration summary

Feature	Public route	Exercised here
Mathematics	<code>math</code>	yes
Tables	<code>tables</code>	yes
Images	<code>image</code>	yes
Citations	<code>citations</code>	yes
Index	<code>index</code>	yes
Hyperlinks	<code>hyperlinks</code>	yes
Running headers	<code>headers</code>	yes
List environments	<code>lists_envs</code>	yes

2. script-specific behavior where required;
3. reusable document features;
4. stable public interfaces.

The IMPE `ExampleBlock` environment provides a distinct indented specimen:

A canonical showcase should be readable as a document, useful as a visual regression specimen, and representative of the public interface that new documents are expected to use.

7.4 Images

The image feature is exercised with the standard $\text{\TeX}$ distribution’s example image when it is available. This keeps the canonical source self-contained without committing an otherwise meaningless binary illustration.

Figure 1 also exercises cross-reference hyperlinks.

7.5 Citations and Bibliography

Citation support is loaded through the feature system and configured before feature activation. A normal textual citation can therefore be written as Knuth (1984), while a parenthetical citation appears as (Knuth, 1984).

The bibliography is printed near the end of the document.

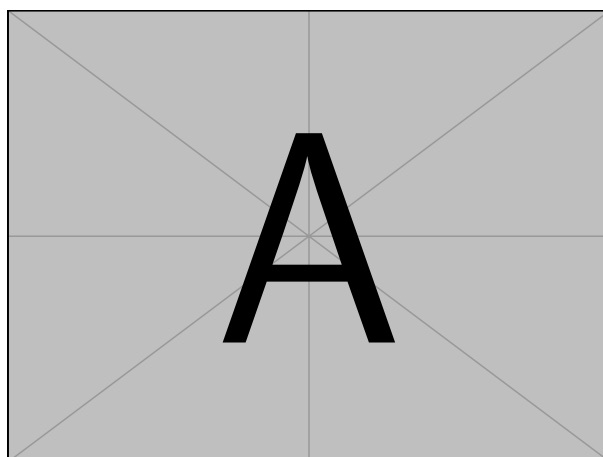


Figure 1: Image-feature specimen using the standard $\text{\TeX}$ example image.

7.6 Index Terms

Several concepts in earlier sections were inserted with the public `\Term` interface. For example, **canonical showcase** (release-time specimen) itself is now indexed. The generated index at the end of the PDF therefore also exercises indexed terms, optional descriptions, and hyperlinks back to their first occurrence.

7.7 Hyperlinks, Footnotes, and Running Headers

The table of contents is clickable, numbered headings carry stable targets, and section headings can link back toward their table-of-contents entries. The running header above this page is produced by the `headers` feature.

Footnote markers are also bidirectional.²

For an external-link specimen, the project repository can be represented with a normal hyperlink: [IMPE \$\text{\LaTeX}\$ System on GitHub](#).

References

Knuth, D. E. (1984). *The texbook*. Addison-Wesley.

²Clicking the footnote marker jumps to this note; the note marker can link back to the original position.

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