Accentual Base Forms of Russian Nouns and Their Relation to Nominative and Genitive Endings

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Abstract. This paper examines underlying stress in Russian nouns. Paradigmatic stem stress is marked on the stressed syllable (called "trivial" by Zaliznjak). Non-trivial accent is morphophonemically more complex. Stress assignment occurs separately in singular and plural subparadigms. The two underlying non-trivial stress types are: underlying stem final (reflex of accentual paradigm B) and underlying stem-initial (reflex of paradigm C). Only one stress rule occurs in B and C subparadigms: "move stress to desinence." Otherwise, B stress remains stem-final and C remains initial. The rule is conditioned by the phonological form of desinences: genitive (zero vs. non-zero ending) for type B and nominative (high-vowel vs. low-vowel vs. other) for C. Singular and plural subparadigms both follow these rules and are conditioned by the subparadigmatic genitive or nominative ending. The Russian noun's split into two accentual types (C~nominative/B~genitive), correlates with observations of Jakobson, such as his contrast of nominative/genitive to the peripheral cases locative/dative/instrumental.

Zaliznjak (1985: 17) subdivided Russian stress patterns into the types he designated as "trivial" and "non-trivial." The **trivial** type has fixed stem stress, while **non-trivial** includes all the accentual types other than fixed stem. This distinction is significant when one approaches the morphophonemic representation of stress. The trivial type can be represented simply by placing a stress mark on the syllable in question (e.g., *koróv*- for the fixed stressed *koróva* 'cow'). However, **non-trivial** paradigms cannot receive such a simple morphophonemic stress mark. Stressed desinences also cannot receive a constant stress mark, since they are only stressed after certain stems.

This paper proposes a new way of treating the non-trivial accentual patterns of the Russian noun. Since the singular and plural stress patterns often act independently, I separately refer to the stress of singular and plural **subparadigms**. These accentual subparadigms do not necessarily agree as to stress pattern. I have previously argued (Feldstein 1980: 125–26) that all the

¹ The notion **non-trivial** has recently been referred to as "nondefault" (Brown et al. 1996: 53).

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non-trivial stress patterns in the subparadigms of the Russian noun can be divided into two large categories (henceforth AP B and AP C). Since there are actually many more surface accentual types than just these two, a word of explanation is in order. If the morphological type (e.g., *a*-nouns, *o*-nouns, or zero-nouns) is held constant for a given subparadigm, I claim that the regular non-trivial stress opposition is binary, as shown in Table 1. In other words, morphological complementary distribution must be taken into account, rather than listing accent types across morphological lines.

Table 1. Binary subparadigmatic oppositions of non-trivial stress

	Singular	Plural
I. Zero-Nouns	End-stress vs. initial	End-stress vs. initial~end- stress
AP B:	End-stress in all forms (e.g., kabán kabaná, kabanóm)	End-stress in all forms (e.g., kabaný, kabanámi)
AP C:	Initial stress in all forms (e.g., vólos, vólosom)	Initial~end-stress (e.g., vólosy, volosámi)
II. o-nouns	End-stress vs. initial	Stem-final (predesinential) vs. end-stress
AP B:	End-stress in all forms (e.g., dolotó , dolotó m)	Stem-final stress in all forms (e.g., dolóta, dolótami)
AP C:	Initial stress in all forms (e.g., zérkalo)	End-stress in all forms (e.g., zerkalá, zerkalámi)
III. a-nouns	End-stress vs. initial~end stress	Stem-final (predesinential vs. initial~end stress
AP B:	End-stress in all forms (e.g., kolbasá , kolbasú)	Stem-final stress in all forms (e.g., kolbásay , kolbásami)
AP C:	Initial~end stress (e.g., golová, gólovu)	Initial~end stress (e.g., gólovy, golovámi)

For example, zero-nouns (predominantly masculine) can have the two non-trivial accentual patterns of end-stress (*kabán* 'boar') or initial-stress (*vólos* 'hair') in the singular subparadigm; in the plural subparadigm, *o*-nouns oppose end-stress (Npl *zerkalá* 'mirror') to stem-final stress (Npl *dolóta* 'chisel').²

² When there is a zero-ending, the stress must surface on the syllable which precedes the zero, but this pattern is still considered to be end-stressed at the morphophonemic

If the two opposed non-trivial stress types are considered across all of the declensional types, it turns out that only one of the opposed entities (AP B) can have stress on the stem-final syllable (Npl kolbásy 'sausage', dolóta), while the other entity (AP C) is marked by its possible stress on stem-initial (e.g., the entire singular of vólos and Asg gólovu 'head'). Stems of at least two syllables must be used to establish this pattern, in order to reveal the difference between stem-initial and stem-final. End-stress is a neutralized value found in both AP B and AP C. Thus, in an accentual opposition between two morphologically identical nouns in a subparadigm, stem-final stress indicates AP B, stem-initial stress points to AP C, while end-stress can occur in either type. Ambiguous end-stress can be assigned on the basis of the unambiguous type opposed to it.³

Although I have stated that Russian non-trivial accentual types regularly observe a binary opposition within a given subparadigm (Table 1), there is an obvious exception to this claim in the plural subparadigm of a-declension nouns, where we find not only the binary opposition of **stem-final** AP B (Npl kolbásy, Ipl kolbásami) and initial~end AP C (Npl gólovy, Ipl golovámi), but also an irregular third non-trivial accentual entity: end-stress throughout the plural, as exemplified by murzá 'Tatar noble', which has end-stress in the entire plural (e.g., Npl murzý). Zaliznjak (1967: 166) observed that a-declension nouns with end-stressed plurals are "rarely used; they mostly consist of Church Slavonicisms and Orientalisms." I would argue that their stress is a Church Slavonic feature, analogous to the exceptional morphophonemic alternation of $t \sim š\check{c}$ (e.g., prevratit', prevrašču 'transform'), rather than Russian $t \sim \check{c}$ (e.g., platit', plaču 'pay'). Many accentual studies (e.g., Brown et al. 1996: 56) treat words such as murzá on a par with the rest of Russian stress. I argue that this misses the regular pattern of binary non-trivial opposition within the subparadigm.4

As stated, I assume two regular non-trivial accentual types for each declensional subparadigm. Possible realizations include stem-initial, stem-final, and end-stress, plus a combination of initial and desinential stresses within a single subparadigm, which is represented as **initial~end** in Table 1. End-

level. In the case of initial stress, stress is overtly manifested only when the stem contains more than one syllable.

 $^{^3}$ For example, singular end-stress ($kab\acute{a}n$) is opposed to initial ($v\acute{o}los$). Since initial stress must be AP C, I take the opposed end-stress to be AP B. However, neuter plural end-stress (Npl $zerkal\acute{a}$) is opposed to stem-final ($dol\acute{o}ta$), so in this case I analyze the ambiguous end-stress as AP C.

⁴ I submit that the removal of anomalous exceptions has also permitted the true pattern to be established in the case of Jakobson's study of Russian conjugation (1948: 163–64).

stress itself is merely a neutralized value, which can occur in either of the two non-trivial stress types. The remaining two stress types—stem-final stress and stem-initial stress—are distinctive features of the two non-trivial stress types, which shall be referred to as AP B and AP C, respectively. In opposition to initial stress, I infer that neutralized end-stress can function as a variant of stem-final; e.g., in opposition to initial-stress Asg gólovu in the a-noun singular, there is end-stress, exemplified by Asg kolbasú. The initial stress (gólovu) is the distinctive feature of AP C. AP B (kolbasú) can have neutralized end-stress as its realization, even though the distinctive property of AP B is stem-final stress (which surfaces in the entire plural subparadigm of kolbasú). The distinctive properties of stem-final and stem-initial stress can serve as the device for morphophonemically marking an entire paradigm (or subparadigm) for stress. AP B stems can be marked with stem-final stress, symbolized by an acute accent following the stem (e.g., kolbas¹-a), with AP C stems having an analogous symbol preceding the stem (e.g., 'golov-(a)).

This paper will demonstrate two aspects of the accentual behavior of AP B and AP C stems marked in this manner, as follows:

- Accentual alternation within a subparadigm is realized by a single rule which can apply equally to both AP B (distinctively stem-final) and AP C (distinctively stem-initial): the advancement of stress to the first syllable of the desinence.
- AP B is correlated with the phonological properties of its genitive case ending, while and AP C is correlated with the nominative case. Thus, if one knows that a stem has the morphophonemic marking of AP B (e.g., kolbas'-(a)), its zero or non-zero **genitive** predicts whether the stress is advanced in the subparadigm. Likewise, if a stem is marked as AP C (e.g., 'golov-(a)), the high, low, or zero-vowel features of its **nominative** desinence predict the precise pattern of stress advancement. This paper makes no claim about the causality of the AP B and AP C stress advancement in relation to the genitive and nominative case forms; its immediate goal is to indicate the existence of the correlation and to suggest its possible uses as a predictive device. The linguistic value of this prediction depends on whether one is dealing with forms in which the AP B/C accentual feature is known, along with the nominative and genitive desinences. If so, the nominative or genitive desinences predict the accentual curve. Let us now consider how nominative and genitive desinences are correlated with the accentual pattern (cf. Jakobson 1984: 136–38).

The basic form of the accentual type AP B is shown by a post-stem stress mark. In order to distinguish it from trivial (i.e. fixed immobile) stress on the stem-final syllable, it can be indicated following the stem, as in *kaban*'-, *dolot*'-(*o*), *kolbas*'-(*a*); see Table 2.

Table 2. Examples of AP B, in which a non-zero genitive conditions stress advance to the desinence

Base Accent	Genitive Singular	Predicted Singular Stress	Genitive Plural	Predicted Plural Stress
kaban'-(Ø)	Non-zero: kaban-á	Advance to end-stress	Non-zero: kaban-óv	Advance to end-stress
dolot'-(o)	Non-zero: dolot-á	Advance to end-stress	Zero: dolót-Ø	No advance to end-stress
kolbas'-(a)	Non-zero: kolbas-ý	Advance to end-stress	Zero: kolbás-Ø	No advance to end-stress

These stem-final stresses are subject to a single rule which advances stress to the first desinential syllable whenever the genitive case of the subparadigm is a non-zero. When the genitive case ending is zero, the stress remains on the stem-final. In the singular, the genitive case ending is always non-zero, predicting that AP B stress is advanced in the full singular subparadigm. E.g., AP B basic forms kaban'-, dolot'-(o), kolbas'-(a) have full advancement in the singular, predicted by non-zero genitives kaban-a, dolot-a, kolbas-y.⁵ In the plural, both zero and non-zero genitives occur. The zero genitives predict the absence of stress advancement; e.g., Gpl dolót-Ø, kolbás-Ø imply Npl dolóta, kolbásy, Ipl dolótami, kolbásami, etc. In the case of AP B kaban'-, both singular and plural have non-zero genitives (Gsg kaban-á and Gpl kaban-óv), predicting stress advance to the desinence in both numbers.

There is further evidence that AP B stress is correlated to the genitive. A deviant zero or non-zero genitive can be accompanied by a rare stress pattern; e.g., masculine diminutives with singular AP B end-stress can take an unexpected Gpl zero (e.g., rožók 'horn', sapožók 'boot', zubók 'tooth', glazók 'eye'). According to Ožegov (1977: 642), the two variant genitive plurals are correlated to two different plural stress patterns (zero Gpl sapóžek, but non-zero

⁵ If a zero-ending form occurs in cases other than the genitive, such as the nominative (*kabán*), the advanced desinential stress is automatically retracted, due to the zero desinence.

sapožkóv), where a zero genitive predicts no advance (sapóžki, sapóžek)) but the non-zero genitive predicts advanced stress (sapožkí, sapožkóv). When the plural of rožók means 'macaroni', the Gpl is rožkóv, and the plural stress is advanced; however, in the meaning 'horn, diminutive', the Gpl is zero (róžek), and the stress is not advanced. In the a-declension plural, Gpl usually has a zeroending, and the stress is not advanced to the ending; e.g., kolbásy, kolbás. However, a-declension words with an unusual plural end-stress are often paired with non-zero Gpl, which predicts the stress advancement; e.g., levšá 'left-handed person', Npl levší, non-zero Gpl levšéj, Ipl levšámi. Also, praščá 'slingshot', Gpl praščéj; baxčá 'melon field', Gpl baxčéj; klešnjá 'claw', Gpl klešnéj. As stated above, there are exceptional AP B nouns with zero Gpl and advanced plural stress (mostly exotic loans), which must be marked as lexical exceptions. Such nouns, with zero Gpl and plural end-stress (e.g., murzá, čertá 'line'), will be considered anomalous.⁶

AP C is morphophonemically represented with pre-stem stress; e.g., 'volos-, 'zerkal-(o), 'golov-(a), as shown in Table 3.

Table 3. Examples of AP C: high-vowel nominative conditions stress advance to oblique cases and low-vowel nominative conditions advance to both nominative and oblique

Base Accent	Nominative Singular	Predicted Singular Stress	Nominative Plural	Predicted Plural Stress
'volos-(Ø)	Non-high/ Non-low	No advance	High: vólos-y	Advance to oblique
'zerkal-(o)	Non-high/ Non-low	No advance	Low: zerkal-á	Advance to nominative/ oblique
'golov-(a)	Low: golov-á	Advance to nominative/oblique	High: gólov-y	Advance to oblique

AP C stress differs from AP B in that it is predicted based on the nominative case and that AP B has only one type of stress advancement (full advance-

⁶ Zaliznjak (1967: 166) realized the exceptional lexical nature of this set of words and attempted to regularize it by establishing phonological stem parameters for this unusual accentual class. However, some of his criteria proved unnecessary, such as the point that these nouns end in -nja; e.g., pešnjá 'ice-breaking bar'. According to Avanesov (1983: 387), plural end-stress is matched with a non-zero Gpl pešnéj, while the zero Gpl is paired with non-advanced stem-final stress: péšni, péšen, etc.

ment in the whole subparadigm, correlated with non-zero genitive). AP C advancement has two subtypes: (1) when the nominative case ending is low (-a), stress advancement occurs in the nominative plus oblique cases; (2) when the nominative is high (-i), advancement affects only oblique. If the nominative is neither low nor high, there is no stress advance and stress remains initial.⁷ I assume that regular **non-trivial** patterns occur either as AP B (with correlation to genitive) or AP C (correlation to nominative). Examples of AP C stress advancement follow. Nsg desinences can be low, mid, or zero (high vowel endings do not occur). Low Nsg predicts stress advance in nominative and oblique (G, L, D, I);8 e.g., AP C 'golov-(a) has advance in Nsg and oblique cases. The non-syncretic accusative is excluded from stress advancement: the Asg stress remains initial; e.g., gólovu, while Nsg and oblique have the advancement: Nsg golová, L/Dsg golové, etc. Non-low Nsg (zero and -o) do not predict stress advance. These rules are conditioned by phonological features of certain case forms, rather than gender or declension type. Thus, the presence of an advanced second locative stress depends on a zero Nsg, without regard to whether the noun's gender is masculine (sneg) or feminine (peč'). In the plural, the Npl ending can be high or low. If low, its stress is advanced in both Npl and oblique; e.g., for AP C stems 'sneg-, 'zerkal-, Npl -a predicts stress advance in the entire plural (nominative plus oblique, zerkalá, snegá), with end-stress in all plural cases. A high Npl vowel implies AP C advance only in the oblique cases of the plural. E.g., Npl -i (in péči, vólosy, óvošči) predicts advance in all plural oblique cases. The plural offers further evidence that the nominative is correlated with stress advancement. When masculines shift from the older high Npl to the new -á ending (e.g., snég, snegá; górod, gorodá), the new low ending automatically implies stress advance in both Npl and oblique cases (as does Nsg -a for feminine nouns; e.g., golová). The only accentual difference between the AP C singular of golová and the plural of gorodá is that the former has a non-syncretic Asg, which is never specified for stress advance.

⁷ It can also be noted that if the nominative is a zero and a second locative exists in the subparadigm, advancement will occur only to the second locative form.

⁸ A syncretic accusative behaves like its syncretic partner, either the nominative or genitive, but a non-syncretic accusative is exempt from stress advancement. The accusative has some parallels to the second locative, in that the non-syncretic accusative and second locative are always lack or possess stress advancement, respectively. Syncretic second locatives, like accusatives, also act just like their syncretic pairs, the regular locatives.

⁹ Except for an advance in the second locative, if such a form exists, predicted by a Nsg zero; e.g., *sneg*, *sneg*; *peč'*, *pečí*.

Thus far, all cited AP B and AP C nouns have had the same basic stress in both numbers, as Tables 2 and 3 demonstrate. AP B types depend on the zero or non-zero status of the genitive, while AP C types depend on the high or low status of the nominative. However, there are also mixed types, in which the singular and plural subparadigms differ in their AP B and AP C representation, as shown in Table 4.

Table 4. Examples of mixed AP B/C and AP C/B, combining the principles of pure AP B and AP C in the different numbers¹⁰

A. AP B/C

		Predicted		
	Genitive	Singular	Nomina-	Predicted
Base Accent	Singular	Stress	tive Plural	Plural Stress
gvozd´'-(Ø); 'gvozd´-(i)	Non-zero: gvozď -á	Advance to end-stress	High- vowel: gvózď -i	Advance to oblique end-ings
suščestv'-(o); 'suščestv-(a)	Non-zero: suščestv-á	Advance to end-stress	Low- vowel: suščestv-á	Advance to nominative/ oblique
gub'-(a); 'gub-(i)	Non-zero: gub-ý	Advance to end-stress	High- vowel: gúb-y	Advance to oblique endings
B. AP C/B				
Base Accent	Nomina- tive Singular	Predicted Singular Stress	Genitive Plural	Predicted Plural Stress
'dar-(Ø); dar'-(y)	Non-high/ Non-Low	No advance to end-stress	Non-zero: dar-óv	Advance to end- stress
'ozer-(o); ozer'-(a)	Non-high/ Non-low	No advance to end-stress	Zero: ozër-Ø	No advance to end-stress
'vod-(a); vod'-(y)	Low: vod-á	Advance to nominative/oblique	Zero: vód-Ø	No advance to end-stress

¹⁰ The forms of *gvozd′* are shown in phonemic transcription, rather than the orthographic transliteration used elsewhere, to show the morpheme division in such forms as Gsg *gvozdjá*; i.e., /gvozd′-á/.

This situation recalls the inflectional pattern of different basic stems for singular and plural (e.g., Russian *syn* 'son', with singular stem {sin-}, but plural {sin-ov'/j-}). In order to indicate that the singular and plural differ in their basic AP B and AP C stress, each number must have a different basic form; e.g., singular AP B and plural AP C: *gvozd'*'-/'*gvozd-i* 'nail'; *suščestv*'-(*o*)/'*suščestv-(a*) 'essence'; *gub*'-(*a*)/'*gub-y* 'lip'. There is also singular AP C/plural AP B: 'dar-/dar'-y 'gift', 'ozer-(o)/ozer'-(a) 'lake', '11 'vod-(a)/vod'-(y) 'water'.

The notion of stress advancement from a base "initial" stress in the plural of <code>suščestvó</code>, may seem unusual, since the word has end-stress in all forms. However, non-trivial plurals with Npl <code>-a</code> can have either stem-final stress (e.g., <code>dolóta</code>), which must be assigned to AP B, or final stress (e.g., <code>gorodá</code>, <code>zerkalá</code>), which is then assigned to AP C by default. In the pure AP C type, the plural advance from initial position can be understood intuitively, since the singular realizes initial stress (<code>górod</code>, <code>zérkalo</code>). In the mixed type (<code>suščestvó</code>), the plural stress pattern is exactly the same as that of <code>górod</code> and <code>zérkalo</code>, and can be thought of as stress assignment to all plural endings, due to the combination of AP C stress classification in the plural and the Npl <code>-a</code> ending.

We now review stress prediction for basic AP B (CVC'-(V)) and AP C ('CVC-(V)) types, including mixed types. Stress marked after the stem means that base stress is on the stem-final vowel, unless advanced to the desinence due to a non-zero genitive. Base stress preceding the stem means that base stress is on the stem-initial vowel, unless advanced to the oblique desinences due to a high-vowel nominative, or to both the nominative and oblique, due to a low-vowel nominative. Nsg zero implies advance in locative-2. The following examples are also listed in Tables 2, 3, and 4:

- 1) *kaban*'-. Post-stem stress (AP B) means genitive predicts stress. Non-zero genitive occurs in both numbers, so stress is advanced to the desinence in singular and plural.
- dolot¹-(o) and kolbas¹-(a). AP B type, so zero genitive again determines the stress pattern. Non-zero Gsg means stress is advanced to all endings; Gpl zero means no advancement of stress from base stem-final position (e.g., kolbásy).
- 3) 'volos-. AP C type means nominative predicts the stress. Nsg non-high/non-low nominative, meaning no stress advance from the base stem-initial. Npl is high, predicting advance to oblique case endings (e.g., volosámi).

¹¹ The diaresis is used since the cited forms are transliterations of Russian orthography. Phonemically, this could be expressed as 'oz'or-(o)/oz'or'-(a).

- 4) 'zerkal-(o). AP C, so nominative predicts stress. Nsg is non-high/non-low, so no advance from initial (zérkalo). High Npl means stress is advanced in nominative and oblique (zerkalá, zerkalámi, etc.).
- 5) 'golov-(a). AP C, so nominative predicts stress. Low Nsg predicts advance to nominative and oblique (golová, golovój, etc.). High Npl predicts advance to oblique only (e.g., golovámi).
- 6) gvozd '-/'gvozd-(i). Mixed type. AP B singular means Gsg predicts singular stress. AP C plural means Npl predicts plural stress. Singular: non-zero Gsg means advance in entire singular. Plural: high Npl predicts advance in oblique only.
- 7) suščestv¹-(o)/¹suščestv-(a). Mixed type. AP B singular means that Gsg predicts singular stress. AP C plural means that Npl predicts plural stress. Singular: non-zero Gsg means that stress is advanced in the entire singular. Plural: low Npl predicts stress advance in nominative and oblique. As noted above, the plural AP C "advance" is not from an actual realization of initial stress, but an assignment of end-stress, based on both stress type (B or C) and desinence.
- 8) 'vod-(a)/vod'-(y). Mixed type. AP C singular means that Nsg predicts singular stress. AP B plural means that Gpl predicts plural stress. Singular: high Nsg means that advance in nominative and oblique leaving only accusative with base initial stress (vodá, but vódu). Plural: zero Gpl predicts no advance; i.e. stem-final (vódy, vódami, etc.).

This paper has demonstrated that the two basic types of Russian non-trivial stress are correlated with the phonological make-up of either the nominative (AP C) or genitive (AP B) endings. The relationship of stress and nominative-genitive endings has been noted by Jakobson (1984: 138), who observed the segmental identity, but prosodic non-identity of Gsg and Npl (e.g., ruki vs. rúki 'hand'). Jakobson also indicated the shared non-marginal status of nominative and genitive in contrast to the oblique cases (1958: 131). In the case of the correlation of nominative and genitive endings with the two basic non-trivial stress types presented above, note that the non-marginal nominative and genitive are involved. Further study can examine whether the AP B and AP C patterns are redundant manifestations of the oppositions zero vs. non-zero genitive and high vs. low vs. mid/zero nominative, or whether the endings are redundant signals of different stress patterns. In any case, the major split of the non-marginal cases, nominative vs. genitive, is supported in a very tangible way by the system of Russian non-trivial stress.

References

- Avanesov, R.I. 1983. Orfoèpičeskij slovar' russkogo jazyka. Moscow: Russkij jazyk.
- Brown, Dunstan, Greville Corbett, Norman Fraser, Andrew Hippisley, and Alan Timberlake. 1996. "Russian noun stress and network morphology." *Linguistics* 34(1): 53–107.
- Feldstein, Ronald F. 1980. "On the definition of Russian stress paradigms." *General Linguistics* 20(3): 123–39.
- Jakobson, Roman. 1948. "Russian conjugation." Word 4–5: 155–67.
- ——. 1958. "Morfologičeskie nabljudenija nad slavjanskim skloneniem." *American Contributions to the Fourth International Congress of Slavicists*. The Hague: Mouton, 127–56.
- ——. 1984. "The relationship between genitive and plural in the declension of Russian nouns." *Russian and Slavic Grammar: Studies 1931–1981*. Berlin: Mouton, 135–40.
- Ožegov, S.I. 1977. Slovar' russkogo jazyka. Moscow: Russkij jazyk.
- Zaliznjak, A.A.1967. Russkoe imennoe slovoizmenenie. Moscow: Nauka.
- ——. 1985. Ot praslavjanskoj akcentuacii k russkoj. Moscow: Nauka.

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