Pittsburgh (United States of America), July 24–31, 2011 Team Contest Deall

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The following ten lines are incorrect examples of Sanskrit poetry. They were originally written correctly, but there have been five deleted macra, four added macra, three changed letters and two deleted words, so that only one line remained unchanged. No syllables have been added or lost (except in the deleted words).

For instance, sentence 9 was originally syād indravajrā yadi tau jagau gah. We can restore the deleted macron over the a in $sy\bar{a}d$ for metrical reasons, but to purge the added macron over the second a in *indravajrā* requires knowing the word (or comparison with line 10). Fortunately, the poets wrote in such a way that it's possible to correct all the changes except that one without any prior knowledge · 10 of Sanskrit.

The mark "", called a macron (pl. macra), denotes vowel length; b^h , d^h , g^h , h, j, \tilde{n} , n, \dot{s} , t^h and yare consonants. There is one more rule of transliteration relevant to the meter that you will have to discover.

The translations correspond to the lines after the two words were deleted and the three letters ** B 8% changed, but before any macra were added or deleted.

100	eq.	b"ujanga-prayatam	"The movement of the snake" consists of four gas.
atitute "		caturb ^h ir gakarai <u>h</u>	otilities and an antilities and an antilities and
TTIMON	2.	$gurunid^hanamar{a}nulag^hur$	In the case where a $guru$ is at the end of 14 lag^hus , it is said to
		iha ś $ar{a}$ ś $ikalar{a}$	be "the ascending period of the moon".
	3.	jarau jarau tato jagau	A ja -and- ra , a ja -and- ra and then a ja -and- ga is called "the fan
	. (ca pañcacamaram vadet	made of five yak tails".
	4.	$mab^halagar{a}~gajagatih$	"The gait of an elephant" is $ma \ b^h a \ la \ ga$.
with the start	5.	mo go go go vidy $unmar{a}lar{a}$	A ma and a ga and a ga and a ga is "the garland of lightning".
matitute	6.	nanagi mad ^h umati	Where there is <i>na na ga</i> , there is "(that which is) full of honey".
	7.	$pramanikar{a}$	"The little measure" is
	8.	$pramar{a}nikar{a}~~padadvayam$	Two lines of "the little measure" they call "the fan made of five
		$vadanti~pa \widetilde{n} cac ar{a} maram$	yak tails".
	9.	$syad$ $indravar{a}jrar{a}$ $yadi$	If perchance there are a pair of <i>tas</i> , a <i>ja</i> -and- <i>ga</i> , and a <i>ga</i> , then it
she y	x 3	tau jagau gah	is "Indra's thunderbolt".
State 2 tors	10.	$ar{u} pendrava jrar{a} \ prat^h ame$	"Upendra's thunderbolt" is that (Indra's thunderbolt) in which
TISUUM.		$lag^hau \; sar{a}$	the first is $lag^h u$.

(a) What is the additional rule of transliteration?

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- (b) Restore the two deleted words, revert the three changed letters, remove the four added macra, ³ and restore the five deleted macra. ³ itute the
 - (c) The macra have been removed from the Sanskrit mnemonic *yamatarajab^hanasalagam*. Which syllables were quru?
- A mnemonic is a word or sentence that helps remembering something (How I wish I could recollect $\rightarrow 3.14159 \approx \pi$). Indra and his younger brother Upendra are Hindu gods. -Adam Hesterberg stille # # 'S Withill the the 'S stitute the the 's stitute \$1 H - 13 withthe the the 's tute the the the

militute # # 3 mininin # ** ** multille m X 3 multille m # * mistille m the " multille m # 3 $\mathbf{2}$ Ninth International Olympiad in Linguistics (2011). Team Contest Problem ·13. 19% Distribute at 0 minutes The following insights will at some point be given as hints: the meaning of guru, the constraints of the poetry, and (in 3 hints) the use of $yamatarajab^hanasalagam$. maximue ## # 3 PE 面对机能称并接触 Answers as of 30 minutes (a) What is the additional rule of transliteration?
(b) Team: 而就机能新祥等除 mistille # # 13 PC (b) • Deleted words: mistille # # # matitute # ** stime to the state • Changed letters: 1. 2. 3. • Words with added macra: maritule ## # B # maxitute # # 3 PK maximue ## # '& P& 1. The second a in the word indravajra in line 9. "你孩 2.3.1110 4. • Words with deleted macra: matine # # 'S R maximue # # 3 PS 面对机能称样谱像 matine # # ' ' ' 1. The a in the word syad in line 9. 3. 4.1111 # 2.5.(+) Insights into the problem matter (use the back of the paper if necessary): matine # # '& R Matitute # # '\$ PK 面的地址称林客梯 matine # # '& R maritule ## # B # Institute ## # '\$ 1% 的前期推荐基本 Multille # # 3 PS maximue # # 'S PS Maritule # # 'S PK matinue # # 'S PC mininte # # 'S PS misting # # 3 PS to the lit is the to the the B to the the B. P. to the the B to the the 's the to the the the

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Distribute at 30 minutes

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We suggest that you compare lines 3 and 8, and lines 9 and 10. (This is just a hint, not the sort of insight you'd get points for.)

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A syllable is *guru* if and only if it has a long vowel or a diphthong or ends in a consonant. Division into syllables ignores word divisions. A sequence of type VCV is divided as V-CV; of type VCCV, as The a in syllable 12 in line 2 had a macron added. mstittle ### mstitute #

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Answers as of 60 minutes

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(a) What is the additional rule of transliteration? institute the A

(b) • Deleted words:

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- Changed letters:
- matinte # # 3 PS Words with added macra:
 - 1. The second a in the word *indravajra* in line 9.
 - 2. The \boldsymbol{a} in syllable 12 in line 2.

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1. The a in the word syad in line 9.

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(+) Insights into the problem matter (use the back of the paper if necessary):

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Distribute at 60 minutes

We suggest that everyone on the team read every part of the problem and all the hints, since some of them may be relevant in unexpected places. (This is just a hint, not the sort of insight you'd get points for.)

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Each line describes the meter in which it's written. stitute # # 13 PR

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The last q in line 1 is incorrect.

Answers as of 90 minutes

Team:

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(a) What is the additional rule of transliteration?

- Deleted words:
- Changed letters:
 - 1. The last q in line 1 was originally

- Autitute # # 3 PR • Words with added macra:
 - 1. The second \boldsymbol{a} in the word *indravajra* in line 9.
 - 2. The a in syllable 12 in line 2.
 - 3.

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- withthe ## # 12 PK The *a* in the word *syad* in line 9.
 3. • Words with deleted macra:

withte mark 's (c) Which syllables in $yamatarajab^hanasalagam$ were guru?

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(+) Insights into the problem matter (use the back of the paper if necessary):

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A syllable is guru if and only if it has a long vowel or a diphthong or ends in a consonant. Division into syllables ignores word divisions. A sequence of type VCV is divided as V-CV; of type VCCV, as Each line describes the meter in which it's written. stitute \$6 \$ 18 加地新林资幣 itute the the state

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Distribute at 90 minutes

If a scribe knew Sanskrit but not the mnemonic system, they're more likely to have changed, say, a ta to a *ra* than a basic Sanskrit word. (This is just a hint, not the sort of insight you'd get points for.) Each meter can be described by a *unique* sequence of the consonants of $yamatarajab^hanasala$ -

ga(m).

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The a in syllable 2 in line 7 had its macron deleted. ute saw M

Answers as of 120 minutes

Team:

(b)

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(a) What is the additional rule of transliteration?

- Deleted words:
- Changed letters:
 - 1. The last q in line 1 was originally

- Withit the the 's the • Words with added macra:
 - 1. The second \boldsymbol{a} in the word *indravajra* in line 9.
 - 2. The a in syllable 12 in line 2.
 - 3.

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- stitute # # 13 PR • Words with deleted macra:
 - The *a* in the word *syad* in line 9.
 The *a* in syllable 2 in line 7.
 3.
- alittle # # 'S (c) Which syllables in $yamatarajab^hanasalagam$ were guru?
 - (+) Insights into the problem matter (use the back of the paper if necessary):

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Each line describes the meter in which it's written.

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Distribute at 120 minutes

That line 1 is four of something is useful information even if you don't know what it's four of. (This is just a hint, not the sort of insight you'd get points for.)

The syllables la and ga stand for $lag^h u$ and guru. Each other syllable of $yamatarajab^h anasa$ laga(m) represents a unique sequence of three $lag^{h}u$ or guru syllables.

The additional rule of transliteration is that e and o are long vowels, although they are written without macra. (In fact, they were once diphthongs ai and au, and the current diphthongs were once $\bar{a}i$ and $\bar{a}u$.)

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Answers as of 150 minutes

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(a) What is the additional rule of transliteration?

The vowels e and o are long, although they are written without macra.

- (b) • Deleted words:
 - Changed letters:
 - 1. The last g in line 1 was originally
 - 2.3.

3. 4.

Words with added macra:

- 1. The second a in the word *indravājrā* in line 9.
- 2. The \boldsymbol{a} in syllable 12 in line 2.
- Withte # # 18 PR Words with deleted macra:
 - 1. The a in the word syad in line 9.
 - 2. The a in syllable 2 in line 7.
 - 3.

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INITAL STATES PR 加加加教教 (c) Which syllables in *yamatarajab^hanasalagam* were *guru*?

(+) Insights into the problem matter (use the back of the paper if necessary):

A syllable is *quru* if and only if it has a long vowel or a diphthong or ends in a consonant. Division into syllables ignores word divisions. A sequence of type VCV is divided as V-CV; of type VCCV, as

VC-CV.

Each line describes the meter in which it's written.

Each meter can be described by a *unique* sequence of the consonants of $yamatarajab^hanasala$ ga(m).

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Distribute at 150 minutes

The names of some of the meters correspond to the meters in poetically interesting ways. For instance, there are 14 days in the lunar cycle, starting with the new moon, when the moon waxes, followed by the full moon itself. (This is just a hint, not the sort of insight you'd get points for, unless you manage to guess a meter from its name alone.)

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Each of the first 8 syllables of $yamatarajab^h anasalagam$ stands for the pattern of $lag^h u$ and gurunto Wat ute the the syllables in that and the next two syllables, after restoring its macra.

One of the deleted words is *jarau*.

Answers as of 180 minutes

Team: 🛛

(a) What is the additional rule of transliteration?

The vowels e and o are long, although they are written without macra.

(b) • Deleted words: *jarau*,

• Changed letters:

1. The last g in line 1 was originally

2. 3.

3.

Words with added macra:

- 1. The second \boldsymbol{a} in the word $indrav\bar{a}jr\bar{a}$ in line 9.
- 2. The a in syllable 12 in line 2.
- atime # # B PR

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• Words with deleted macra:

- with deleted macra:
 The *a* in the word *syad* in line 9.
 The *a* in syllable 2 in line 7.
 3.
- 4.

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Each of the first 8 syllables of $yamatarajab^hanasalagam$ stands for the pattern of lag^hu and guruINTE WE WE'S titute # # 'S syllables in that and the next two syllables (after restoring its macra).