

The Ichimoku Cloud Is a Past Drawn Twenty-Six Bars Ahead

[F002]

Moving the forward shift of the cloud through 0, 13, 26, 52 and 104, the standard 26 is the best of the five in only 1 of 8 cases — in the selection period all four series are positive and in the evaluation period all four are negative — and on synthetic series whose within-bar movement is also random, the measured value falls inside the random range for all four

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Abstract

This paper asks whether the convention of drawing the Ichimoku cloud twenty-six bars ahead adds any information — the answer is that it does not. It claims neither a new mathematical theorem nor a new law.

First, taking the standard Ichimoku and using "buy when price is above the cloud, sell when below" as the signal, the selection period gives positive values in all four series (**1.1318** to **6.3214** pips) while the evaluation period gives negative values in all four (**-0.2312** to **-2.0319** pips). **All four change sign** (Section 3).

Second, and this is the core of the paper, moving the forward shift through 0, 13, 26, 52 and 104, **the standard 26 is the best of the five in only 1 of 8 cases**. By chance it would be **1.6** (Section 4).

Third, the triple signal reduces the count to **0.741** of its original value while the directional information moves by only **+0.0173 pips**. And across the **20** cells of this paper, the overall mean and the mean of the daily means **disagree in sign in 7** (Section 5).

Fourth, the lagging-span condition agrees with "the current close is above the close twenty-six bars ago" with **0 disagreements** in all four series (Section 6).

Fifth, splitting by the thickness of the cloud into quintiles gives a result that is **not monotone** in any of the four series. Thickness is a quantity symmetric up and down and carries no direction (Section 7).

Sixth, on synthetic series whose within-bar movement is also random, the measured value falls inside the range of the 20 realisations in **all four series**. And splitting into five non-overlapping sessions, the daily-clustered t reaches 2 in absolute value in **0 of the 20** cells (Sections 7 and 8).

Scope of this paper (scope note): No new mathematical theorem and no new law is **claimed** — the definition of Ichimoku, the midpoint of a rolling high and low, and random walks are all known. **No particular product or proponent is discussed** — no real course, author, or vendor is the subject here, and none is named. What is treated is the public indicator itself. **Trading is not discussed** — what is measured is directional information, not trading performance including commissions, fills and money management. **The scope is intraday and a small number of instruments** — four series, six years, one-hour bars. Nothing is said about all markets or all time scales. In particular, this paper does not contradict results documented at longer holding periods, such as monthly time-series momentum. **No forecast is claimed** — no method for predicting future prices from the cloud is proposed. **The author of the indicator is not criticised** — what is measured is the effect of the convention of shifting by twenty-six bars, not the value of the indicator as a whole.

Relation to earlier papers: Paper 422 showed that removing the condition named as the core of a rule does not move the result — this paper applies that shape to a display convention of an indicator. Paper 264 showed that a threshold belongs to its lattice — here the number twenty-six belongs to the bars one chose. Paper 423 showed that a wrong conclusion can come from correct parts — the calculation of the cloud is correct; what errs is the reading. F001 of this series showed that the "period" of a moving-average crossover comes from the ratio of the two periods — this paper stands beside it and measures the same thing for a different number in a different indicator. What is added here is **declaring the shift as the separator in advance and measuring it at five values, placing the selection and evaluation periods side by side so the change of sign is visible, confirming by count that the lagging-span condition is identical to another expression, and placing a baseline whose within-bar movement is also random alongside under the same procedure.**

1. Notation and the question

Ichimoku is built from five lines.

Line	Definition
Tenkan	(highest high + lowest low) / 2 over the last 9 bars
Kijun	(highest high + lowest low) / 2 over the last 26 bars
Senkou span A	(Tenkan + Kijun) / 2, drawn 26 bars ahead
Senkou span B	(highest high + lowest low) / 2 over the last 52 bars, drawn 26 bars ahead
Chikou span	the close, drawn 26 bars behind

The band between senkou spans A and B is the **cloud**. The cloud always lies ahead of the candles.

Observation 1.1: the value of a senkou span is determined by **the highs and lows up to that moment alone**. Drawing it 26 bars ahead is an act of plotting, not of using the future in the calculation. **There is no look-ahead.**

Observation 1.2: yet the name "leading" suggests that the band says something about future prices. **It suggests it; it has not been confirmed.**

Question: does the convention of shifting by twenty-six bars add any information?

Observation 1.3: this question can be settled. **Move the shift.** If information is being added, the standard 26 should be better than the other values. If every value gives the same thing, the shifting does not change the answer.

2. Writing the quantity and the design in advance

The **quantity measured** is directional information.

...

$D = \text{mean}(\text{sign of the signal} \times \text{the price move over the next } h \text{ bars})$ in pips

...

The signal is +1 (buy) when price is above the cloud, −1 (sell) when below, and 0 (do nothing) when inside. D is the same quantity as half the difference between the expectation of buying and of selling; reversing which way one bets flips its sign. **It is zero for any quantity symmetric up and down.**

Design (declared before running and unchanged at run time)

Item	Decision
Bars	one hour, mid price, closing value of completed bars only (the last tick in the bar)
Instruments	USDJPY, EURUSD, GBPUSD, XAUUSD
Period	2019–2024. Selection 2019–2021 / evaluation 2022–2024 (the evaluation period is never used for selection)
Horizon	$h = 26$ (one cloud period) as the base, with 1, 6 and 78 alongside
Separator	the forward shift of the cloud, $k = 0, 13, 26, 52, 104$
Cost	the median spread of the same bars is always reported alongside
t value	always clustered by day (averaged within a day first)

Observation 2.1: ⚠️ this paper does **not** measure with an exit that cuts at a take-profit or a stop-loss. Which side was touched first within a bar is not determined by the bar's high and low. Measuring with barriers is a different question, treated in a different paper.

Observation 2.2: ⚠️ D does not include cost. **It must always be read alongside the spread.** If the directional information falls below the spread, it may still be a fact about the market, but it is not a trade.

The bar counts are **36,534** for USDJPY, **36,554** for EURUSD, **36,535** for GBPUSD and **34,892** for XAUUSD.

3. Measuring the standard Ichimoku

Calculation 3.1 Using above/below the cloud as the signal (h = 26)

Instrument	Period	Count	D (overall mean)	Dd (daily mean)	Daily t	Per day
USDJPY	selection	16,083	1.1318	0.8190	0.69	21.0
USDJPY	evaluation	15,417	− 0.2312	− 1.7445	− 0.70	19.0
EURUSD	selection	16,079	2.6359	0.8425	0.73	21.0
EURUSD	evaluation	15,223	− 1.3477	− 1.0494	− 0.77	19.0
GBPUSD	selection	16,059	2.4824	− 0.7000	− 0.37	21.0
GBPUSD	evaluation	15,189	− 0.9534	− 2.0512	− 1.13	19.0
XAUUSD	selection	14,784	6.3214	3.7842	0.82	20.0
XAUUSD	evaluation	14,835	− 2.0319	− 9.4315	− 1.78	20.0

Observation 3.2: the selection period is positive in all four series and the evaluation period is negative in all four. All four change sign.

Observation 3.3: ⚠ for all four to flip together is for something common to all four to have changed. This paper does not identify what. A reading in which above/below the cloud is a trend-following signal, and therefore depends strongly on the character of price movement in each period, is available. But what has not been measured is not written as measured.

Observation 3.4: the daily-clustered t does not exceed 1.78 in absolute value in any of the eight cases. Neither sign reaches a level distinguishable from noise.

Observation 3.5: in the evaluation period D ranges from −2.0319 to −0.2312, while the spread over the same period ranges from 0.3000 to 3.5700. The absolute value exceeds the spread in only 2 of the 4 series, and in those two the sign is negative (that is, it concerns betting against the signal).

Observation 3.6: the table carries two means side by side. **D** is the mean over all observations; **Dd** is the mean of the daily means. With **19.0** to **21.0** observations a day, a day with many observations pulls the overall mean that much harder. For GBPUSD in the selection period the two are **2.4824** and **−0.7000**: the signs disagree. Neither may be written on its own.

4. Moving the shift — this is the separator

The forward shift k is moved through 0, 13, 26, 52 and 104, with everything else held the same.

Calculation 4.1 The shift and the directional information

Instrument	Period	k=0	k=13	k=26	k=52	k=104	Best k
USDJPY	selection	1.3322	0.9998	1.1318	0.7595	− 2.4291	0
USDJPY	evaluation	1.0896	− 0.0812	− 0.2312	− 0.1654	4.7075	104
EURUSD	selection	1.8675	2.2486	2.6359	2.4418	− 0.5961	26
EURUSD	evaluation	− 0.9692	− 1.0752	− 1.3477	− 0.7144	− 0.8217	52
GBPUSD	selection	2.8444	3.0223	2.4824	1.8827	0.5668	13
GBPUSD	evaluation	− 1.3644	− 0.6493	− 0.9534	0.2530	0.0106	52
XAUUSD	selection	6.5993	7.1570	6.3214	4.5092	− 8.9438	13
XAUUSD	evaluation	0.2981	− 0.1508	− 2.0319	4.1274	11.7696	104

Observation 4.2: the standard 26 is the best of the five in only 1 of the 8 cases. Choosing at random among five would give **1.6**, so the measured figure is below chance.

Observation 4.3: the best k does not agree between the selection and evaluation periods, even within the same instrument. USDJPY gives 0 and 104, EURUSD 26 and 52, GBPUSD 13 and 52, XAUUSD 13 and 104. All four disagree.

Observation 4.4: the spread of D as k is moved has a median of **3.4966** pips and a maximum of **16.1009** pips. The median spread over the same period is **0.7500** pips, so **the range is several times the cost**. In other words, the single act of choosing the shift can manufacture an apparent difference several times the cost.

Observation 4.5: this is not information but room to choose. A wide range whose best position swaps between periods indicates only how much noise there is to pick from.



Figure 1: the selection period on the left, the evaluation period on the right. The vertical axis is the directional information and the horizontal axis the forward shift; the dashed line marks the standard 26. **The shapes are opposite between the two panels** — the right-hand end that falls in the selection period rises in the evaluation period.

5. Stacking the conditions of the triple signal

The "triple signal" refers to a state in which price is above the cloud, the Tenkan is above the Kijun, and the Chikou span is above the price twenty-six bars ago. The conditions are added one at a time to see

how the count and the directional information move.

Calculation 5.1 Stacking the conditions (evaluation period, h = 26)

Instrument	Condition	Count	D (overall)	Dd (daily)	Daily t	Per day	spr
USDJPY	1: above cloud only	9,810	4.9429	−6.3441	−1.70	15.0	0.60
USDJPY	2: + Tenkan > Kijun	7,766	4.3843	−6.3394	−1.63	12.0	0.60
USDJPY	3: + Chikou above	7,361	3.8856	−6.3396	−1.62	12.0	0.60
EURUSD	1: above cloud only	7,267	−3.5754	−8.2240	−3.87	12.0	0.30
EURUSD	2: + Tenkan > Kijun	5,546	−3.8626	−7.4324	−3.33	10.0	0.30
EURUSD	3: + Chikou above	5,318	−3.9104	−7.6880	−3.37	10.0	0.30
GBPUSD	1: above cloud only	7,471	−2.7575	−10.9872	−3.95	12.0	0.90
GBPUSD	2: + Tenkan > Kijun	5,729	−1.8482	−10.6912	−3.71	10.0	0.90
GBPUSD	3: + Chikou above	5,453	−2.3880	−11.1307	−3.82	10.0	0.90
XAUUSD	1: above cloud only	7,922	8.4604	−23.7451	−2.94	14.0	3.58
XAUUSD	2: + Tenkan > Kijun	6,195	12.2607	−20.3698	−2.37	11.0	3.60

XAUUSD	3: + Chikou above	5,941	10.3435	− 21.4042	− 2.48	11.0	3.60
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Observation 5.2: stacking all three reduces the count to **0.741** of its original value (minimum **0.730**, maximum **0.750**). The proportion is nearly the same across the four series.

Observation 5.3: the directional information then moves by **+0.0173 pips** (minimum **−1.0574**, maximum **+1.8830**). **Even the sign does not agree.**

Observation 5.4: so stacking the conditions only reduces the count to three quarters. This is the same shape as Paper 422 showed — removing the condition named as the core of a rule does not move the result.

Observation 5.5: ⚠ the D in this section looks at buys only, so it is a different quantity from the D of Section 3 (the difference between buys and sells). **To avoid writing two quantities under one symbol, this section is stated as buys only.**

Observation 5.6: here the disagreement is large. For USDJPY the overall mean is **4.9429** while the daily mean is **−6.3441**; for XAUUSD they are **8.4604** and **−23.7451**. Across the **20** cells of this paper the signs disagree in **7**. **Days with many observations are making the mean of the period.** This is not a question of which one is right. **They are two different quantities, and there is no correct way to write them other than both.**

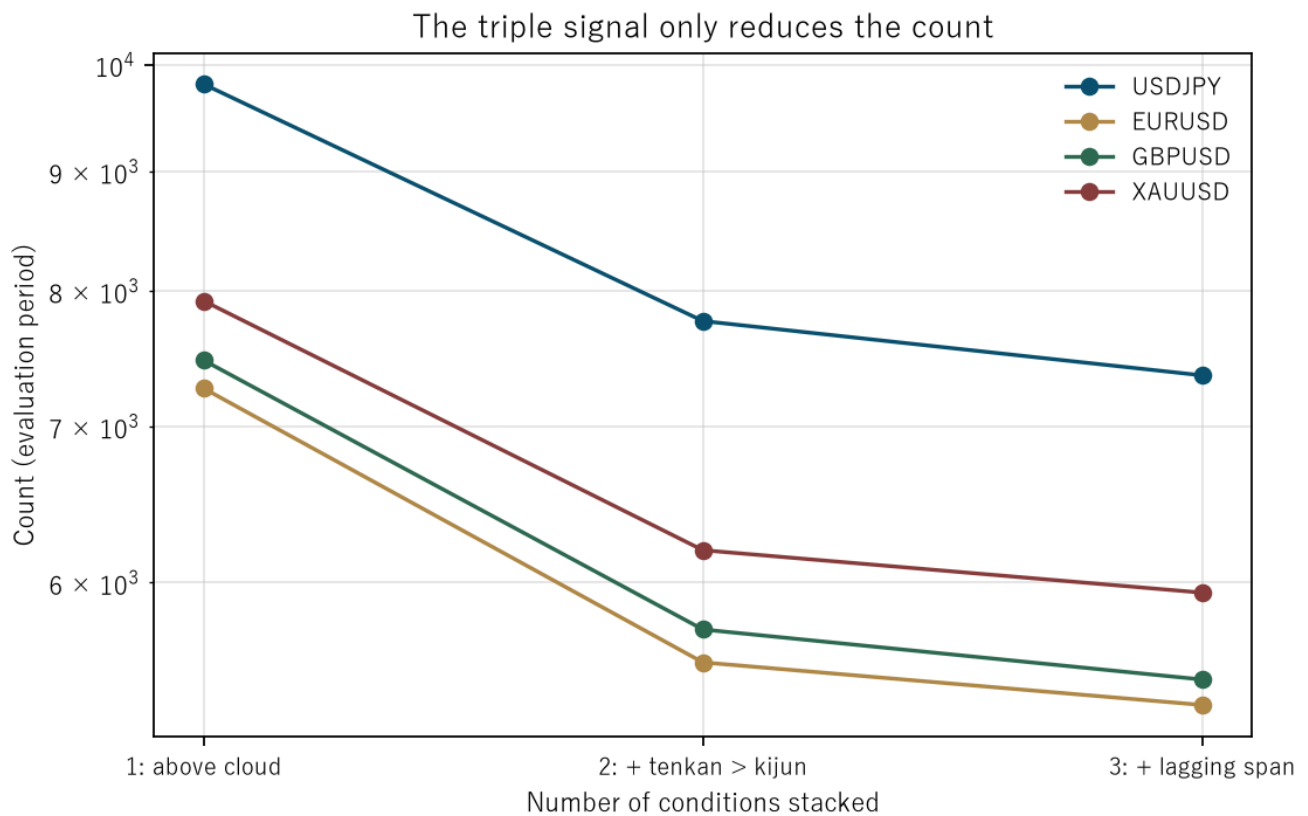


Figure 2: the vertical axis is the count on a logarithmic scale. As the conditions are stacked, all four series fall with the same slope.

6. What expression is the Chikou span identical to?

The Chikou span is the close drawn twenty-six bars behind. The condition "the Chikou span is above the price twenty-six bars ago" rewrites as "the current close is above the close twenty-six bars ago."

Calculation 6.1 How often the two conditions agree

Instrument	Times Chikou is above	Times above the close 26 bars ago	Disagreements
USDJPY	19,874	19,874	0
EURUSD	18,060	18,060	0
GBPUSD	18,397	18,397	0
XAUUSD	18,689	18,689	0

Observation 6.2: there are 0 disagreements in all four series. The two are the same expression, not two values that happen to be close.

Observation 6.3: so the Chikou span brings in no new quantity. It plots the operation "compare with twenty-six bars ago" as a line. ⚠ This, however, **follows from the definition**; it is not a discovery. What this paper adds is only **confirming it by count**.

7. Quantities without direction, and the baseline

Calculation 7.1 Splitting by the thickness of the cloud into quintiles (evaluation period)

Instrument	Q1 (thin)	Q2	Q3	Q4	Q5 (thick)	Monotone?
USDJPY	4.1615	0.0870	− 0.6829	4.0035	− 8.7054	not monotone
EURUSD	− 1.7503	− 4.0275	− 3.4112	− 3.2675	5.7005	not monotone
GBPUSD	− 4.7125	− 1.4113	1.3616	0.5442	− 0.5608	not monotone
XAUUSD	3.3120	− 5.6702	5.1975	− 4.3223	− 8.6557	not monotone

Observation 7.2: the thickness of the cloud grows the same way upward and downward: it is **a quantity without direction**. Splitting by a quantity without direction cannot, in principle, order directional information. **That none of the four series came out monotone is consistent with that expectation.**

Calculation 7.3 The baseline — synthetic series whose within-bar movement is also random

With the same timestamps and the same number of bars as the real data, **20** series are built in which the movement inside each bar is also made of independent normal increments (seeds fixed at 0 to 19), and the same measurement is made.

Instrument	Measured D	Median random D	Random minimum	Random maximum	I
USDJPY	−0.2312	−2.0411	−6.4987	3.7271	y
EURUSD	−1.3477	−1.4199	−4.4568	2.5373	y
GBPUSD	−0.9534	−2.0182	−6.4397	3.6635	y
XAUUSD	−2.0319	−5.7730	−13.7317	7.6514	y



Observation 7.4: in all four series the measured value falls inside the range of the 20 realisations. Ichimoku on a market and Ichimoku on a series with no trend, no news and no participants have not been distinguished by this way of measuring.

Observation 7.5: ⚠️ "not distinguished" is not "the same". The range of the 20 realisations is wide (for USDJPY, −6.4987 to 3.7271), which also means **the power of the test is low**. **What this paper can say is that with this sample and this measurement they could not be separated, and no more.**

Calculation 7.6 Moving the horizon h (evaluation period)

Instrument	h=1	h=6	h=26	h=78
USDJPY	0.1416	0.3214	− 0.2312	8.4824
USDJPY (t)	− 0.67	− 0.55	− 0.70	0.60
EURUSD	− 0.1818	− 0.8360	− 1.3477	− 3.8018
EURUSD (t)	− 3.02	− 2.46	− 0.77	− 1.29
GBPUSD	− 0.0978	− 0.6094	− 0.9534	2.5410
GBPUSD (t)	− 2.10	− 1.81	− 1.13	0.99
XAUUSD	0.1732	1.0432	− 2.0319	12.8118
XAUUSD (t)	− 1.57	− 1.20	− 1.78	0.93

Observation 7.7: moving h from 1 to 78, the sign stays the same in only **1 of the 4 series**. **If the sign changes with the choice of h, it is not directional information but an accident of the window.**

Observation 7.8: the daily-clustered t exceeds 2 in absolute value in **3 of the 16 cells**. All three are **negative** and sit at the short end of h (1 and 6). **A negative value at the short end is consistent with measuring inside the spread.**

8. Splitting by session

Against the result that above and below the cloud carries no directional information, the first question is whether the sessions were separated. Price behaves differently in Tokyo, London and New York, so information confined to a single session is possible.

Design: five **non-overlapping** bins in Coordinated Universal Time — Tokyo 0–7, London 7–12, overlap 12–16, late New York 16–21, and night 21–24.

Observation 8.1: bins must not overlap. Placing "London 7–16" beside "overlap 12–16" creates places whose contents are the same as their neighbour's, and **something will look good somewhere**. Making them exclusive removes exactly that much room.

Calculation 8.2 Directional information in each of the five bins (evaluation period, $h = 26$)

Instrument	Tokyo 0–7	London 7–12	Overlap 12–16	NY late 16–21	Night 21–24
USDJPY	1.21 (t 0.02)	− 0.98 (t − 0.78)	− 1.58 (t − 0.20)	− 1.46 (t − 0.95)	1.36 (t 0.02)
EURUSD	− 0.44 (t − 0.58)	− 2.88 (t − 1.53)	− 1.44 (t − 1.45)	− 1.41 (t − 1.06)	− 0.77 (t − 0.05)
GBPUSD	− 0.74 (t − 0.52)	− 2.03 (t − 1.23)	− 1.47 (t − 1.16)	− 0.96 (t − 0.76)	1.12 (t 0.06)
XAUUSD	0.59 (t − 0.53)	− 2.10 (t − 0.48)	− 0.91 (t − 1.06)	− 4.96 (t − 0.79)	− 6.05 (t − 0.86)

Observation 8.3: the daily-clustered t reaches 2 in absolute value in **0 of the 20** cells. Five bins times four instruments are being tried, so by chance about **0.9 cells** would be expected. **The measured figure is below that.**

Observation 8.4: what is read here is not the individual cell. **Trying five and finding one that looks significant is the ordinary case.** What is read is whether the number of significant cells exceeds chance.

Observation 8.5: looking at the magnitudes, London 7–12 is negative in all four series (−0.98, −2.88, −2.03, −2.10). Yet none of the t values exceeds 1.53 in absolute value. **Signs agreeing and being distinguishable from noise are two different things.**

9. Limitations

1. **The measurement uses a fixed horizon.** It does not use an exit that cuts at a take-profit or a stop-loss, because which side was touched first within a bar is not determined by the high and the low. A barrier version is a different question and is not treated here.
2. **Only one lattice is used.** Bars are fixed at one hour. Whether the same shape appears on daily or five-minute bars is not measured. Twenty-six is defined relative to the choice of bars, so **changing the lattice makes it a different quantity.**
3. **Only one reading of the cloud is examined.** Twists in the cloud, approaches to the cloud, and pullbacks to the Kijun are not treated.
4. **The selection and evaluation periods are three years each.** That all four series flipped sign together may depend on how the periods were cut. Only two periods were examined.
5. **The synthetic baseline uses independent normal increments.** The heavy tails and volatility clustering of real price moves are not included. It is the simplest possible baseline and its power is not high.
6. **Four instruments over six years.** Nothing is said about other markets or other periods.
7. **The indicator as a whole is not evaluated.** What was measured is the effect of the convention of shifting by twenty-six bars, and a few readings.

Conclusion

The Ichimoku cloud is drawn ahead of the candles. But its values are determined by the highs and lows up to that moment alone. **What lies ahead is a picture, not information.**

Moving the shift from 0 to 104 moves the directional information across a median range of **3.4966** pips, several times the cost. Yet the best position disagrees between the selection and evaluation periods in all four series, and the standard 26 was best in only **1 of 8** cases. **A wide range is not the presence of information. It is the presence of room to choose.**

One thing separates the cases — whether shifting increased the material that enters the calculation. It did not. Drawn twenty-six bars ahead, the highs and lows in use are the same ones.

And what this paper could measure is directional information under a fixed horizon alone. **About the shapes the users of this indicator actually watch — twists, approaches, pullbacks — nothing is answered here.**

Data and reproduction

Data	Currency ticks from Dukascopy (agreement to the millisecond, bid and ask, verified from 2019 onward). Gold from Dukascopy
Period	2019–2024 (six years). Selection 2019–2021 / evaluation 2022–2024
Instruments	USDJPY, EURUSD, GBPUSD, XAUUSD
Bars	One hour, mid price, closing value of completed bars only. Bars with no ticks are not created
Verification	<code>検算/F002.py</code> (with <code>--zu</code> it also writes the figures). Every number in the text is taken from <code>検算/F002_output.txt</code>
Figures	<code>図/F002_zu1</code> , <code>図/F002_zu2</code> (png, svg, English versions)
Random seeds	Fixed at 0–19. Re-running gives the same values

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