23-Proportion-and-Scale

Proportion & scale

Shape of graphics

Shape of graphics

GRAPHICS SHOULD BE DRAWN IN LANDSCAPE MODE UNLESS THE NATURE OF THE DATA TELLS US OTHERWISE

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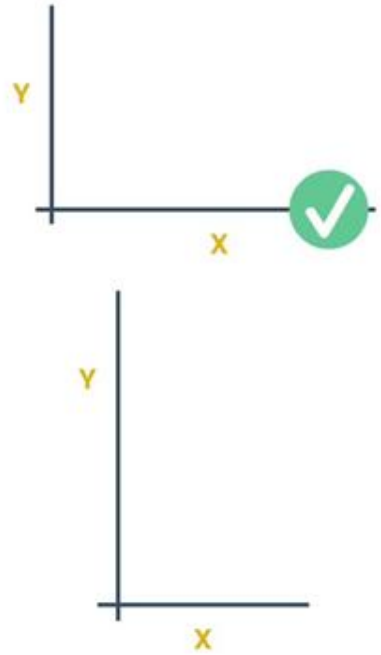
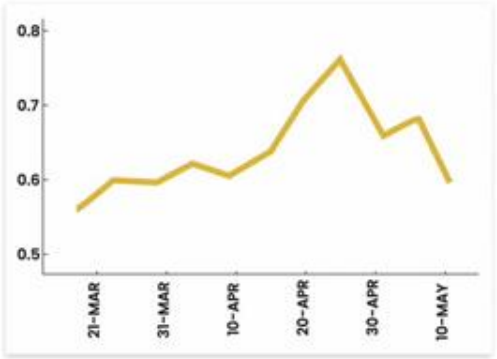
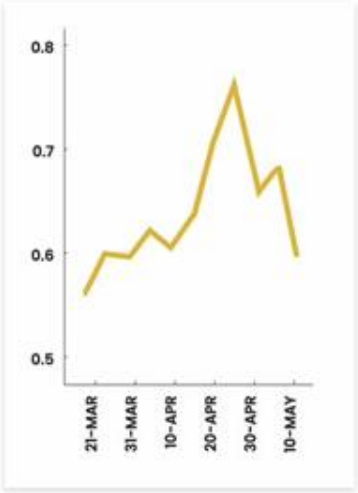


REASON 1

Our eye is naturally practiced in detecting deviation from the horizon.
e.g. horizontal time series are more accessible to the eye





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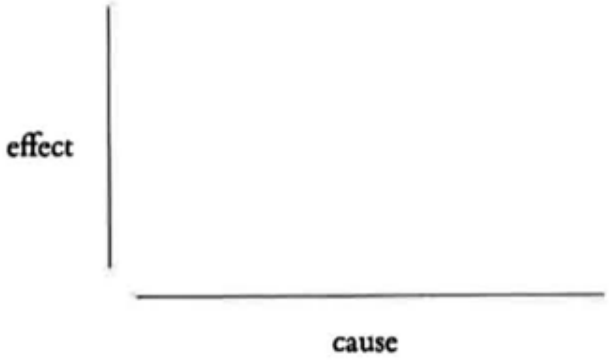
REASON 3

It allows us to put emphasis on causality (if there is any).
Many graphics plot:



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WHAT ASPECT RATIO SHOULD IT BE?

Shape of graphics

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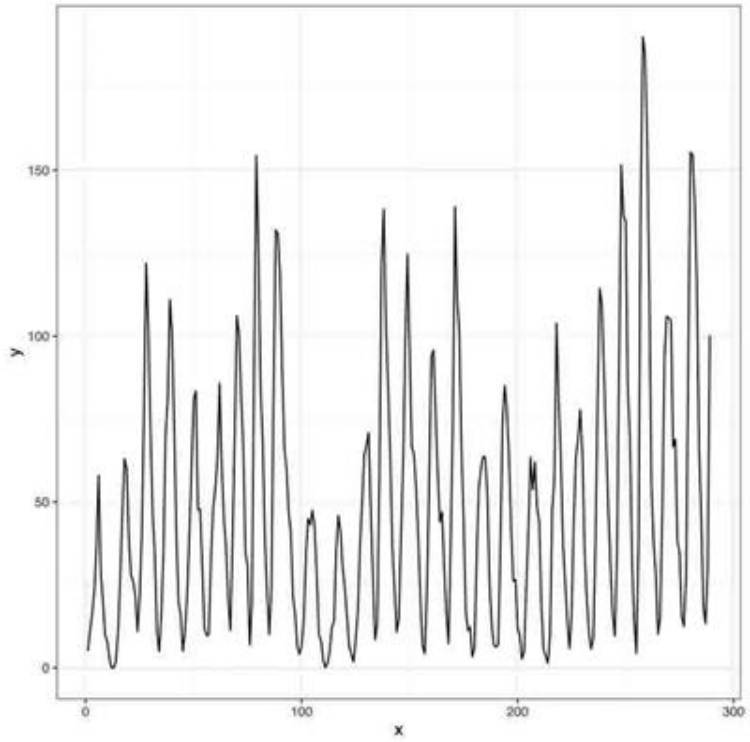
WHAT ASPECT RATIO SHOULD IT BE?

The golden rectangle has a ratio of 1:1.6

Banking to 45°

For time series, William Cleveland demonstrates how the aspect ratio can affect the analyst's perception of trends in the data.



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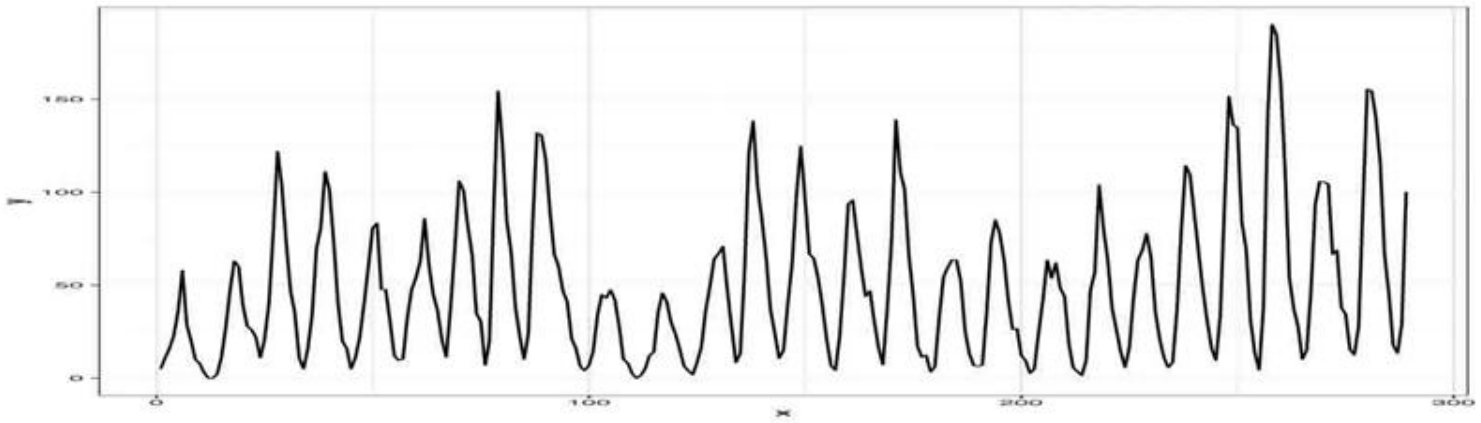

WHAT IS THE APPROPRIATE ASPECT RATIO FOR TIME SERIES LIKE THIS?

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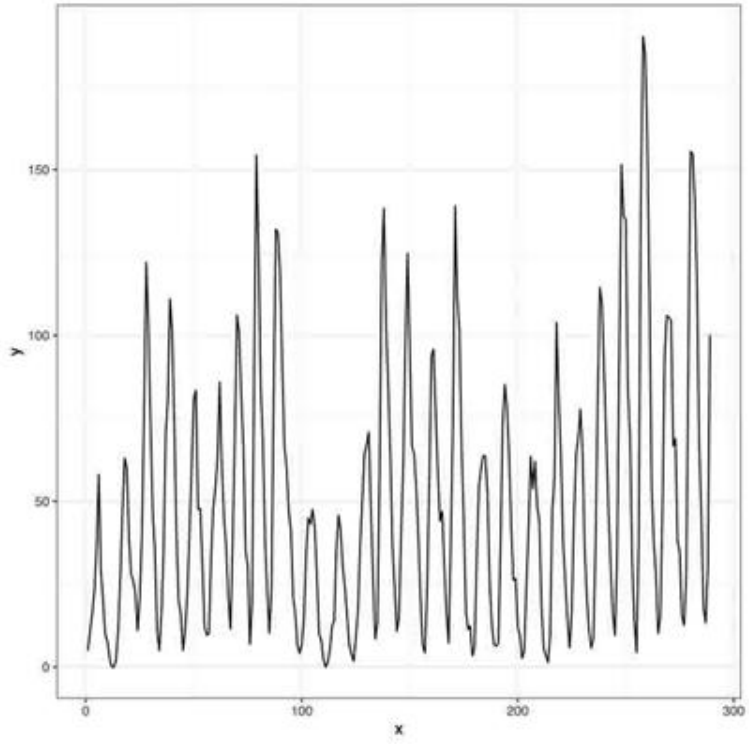
Cleveland proposes an optimization technique, called **banking to 45°**, for computing the aspect ratio such that the average absolute orientation of line segments in the chart is equal to 45 degrees.



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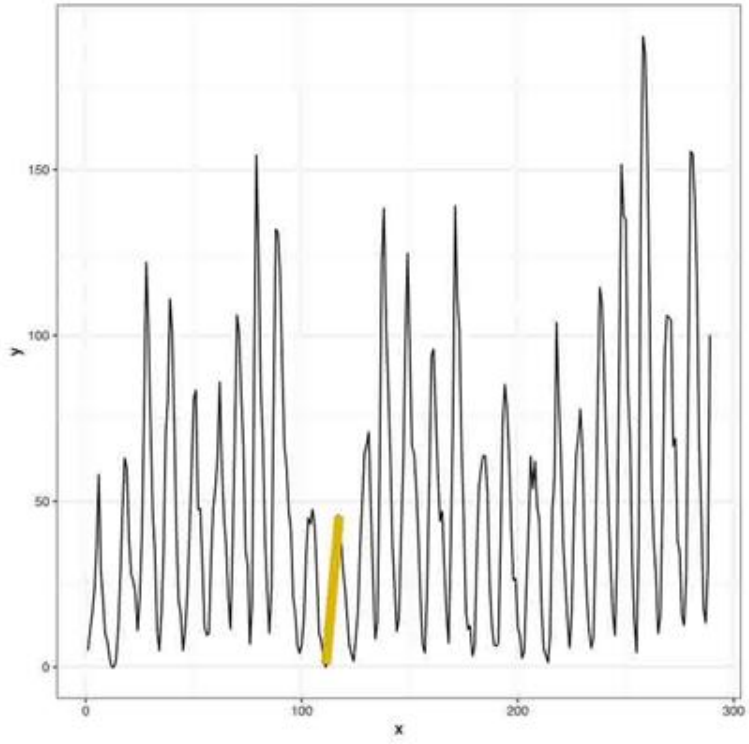

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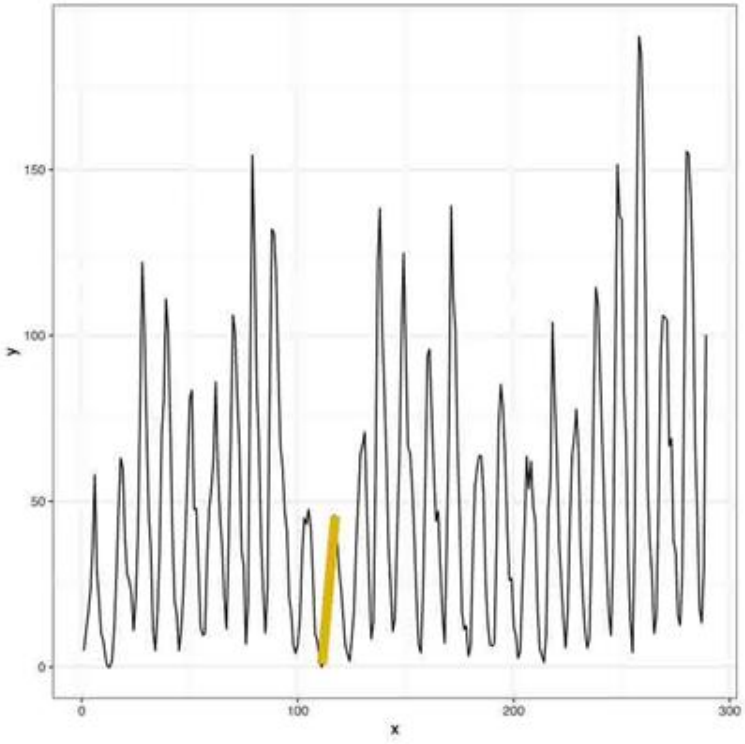
The **goal** is to maximize the discriminability of the orientations of the line segments in the chart.



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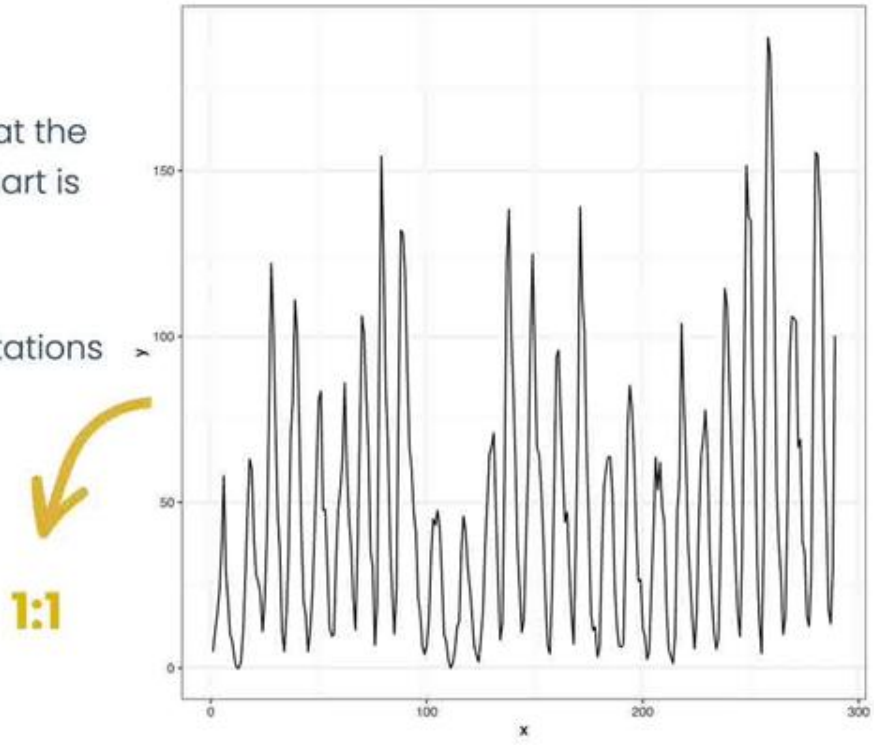

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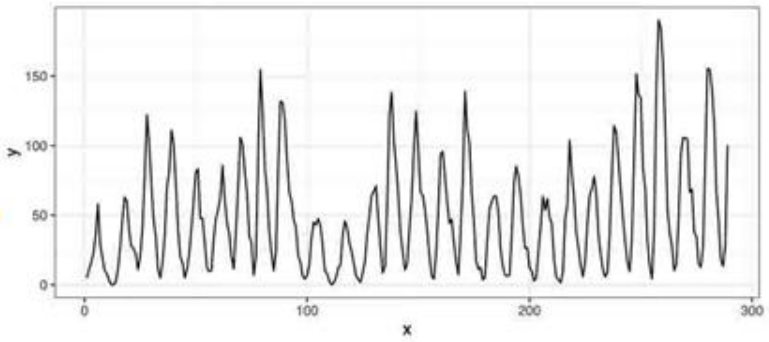

1:1.6 (golden ratio)

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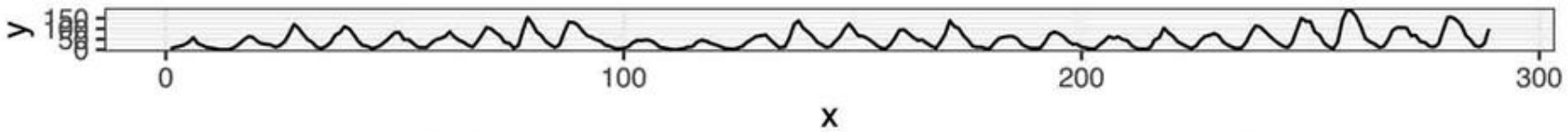

1:30 (aspect ratio calculated with banking to 45°)

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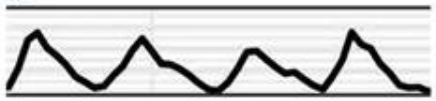
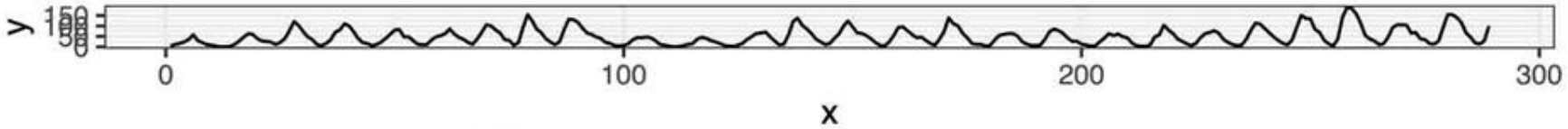


The peaks go up faster than they go down



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Banking to 45° > How does it work?

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Goal: Determine the aspect ratio such that the average orientation of all line segments in a chart is 45°

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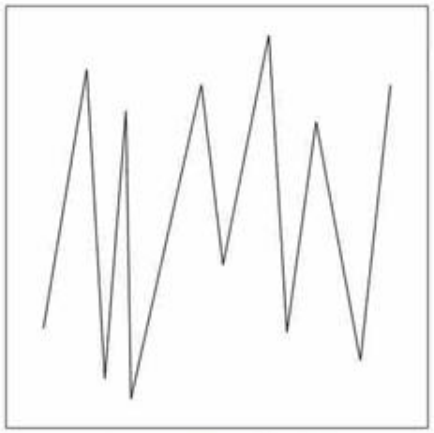

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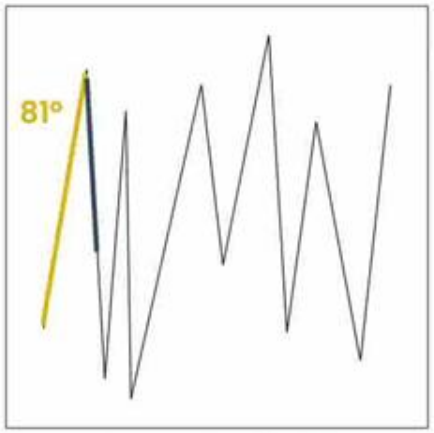

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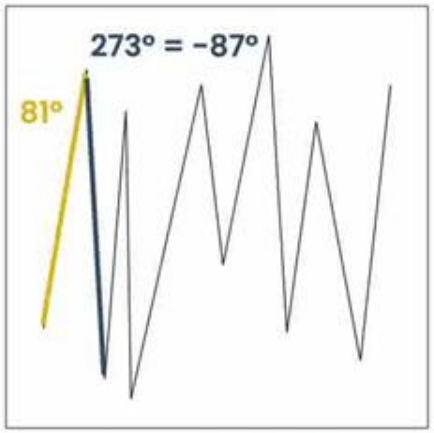

Aspect ratio 1:1

81°	87°	85°	89°	77°	83°	78°	87°	82°	79°	84°

mean = 82.9

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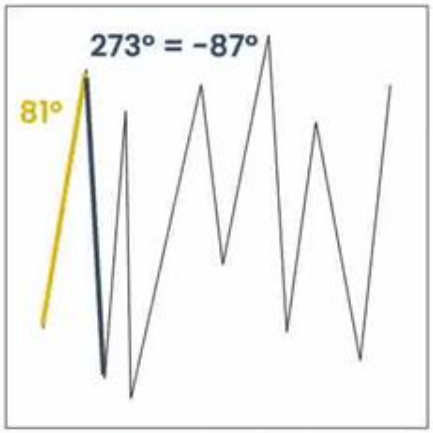

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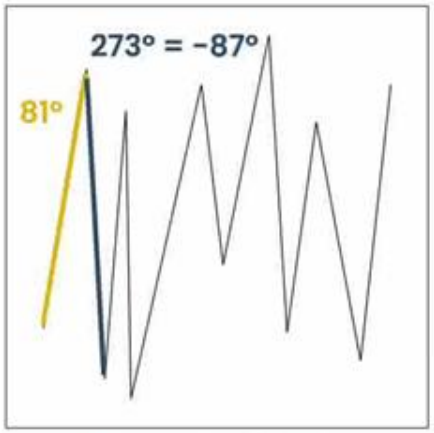

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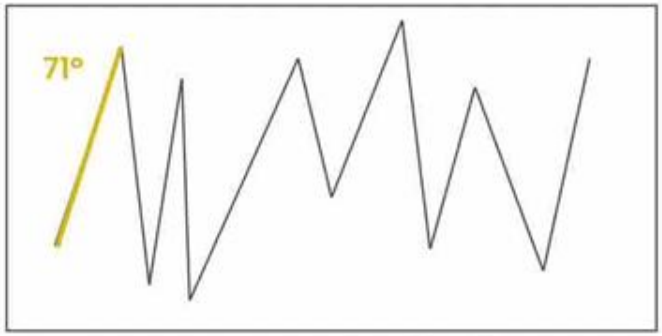

Aspect ratio 1:2

81° **87°** 85° 89° 77° 83° 78° 87° 82° 79° 84°

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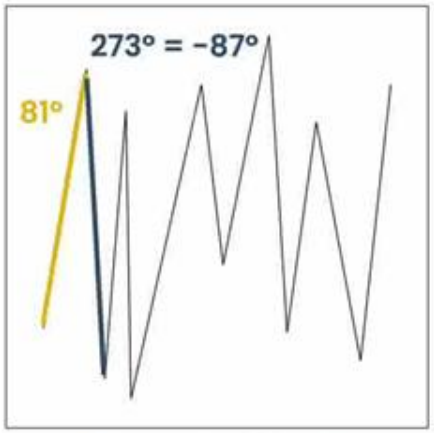

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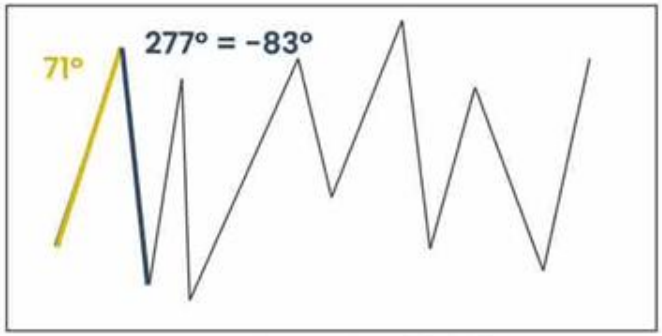

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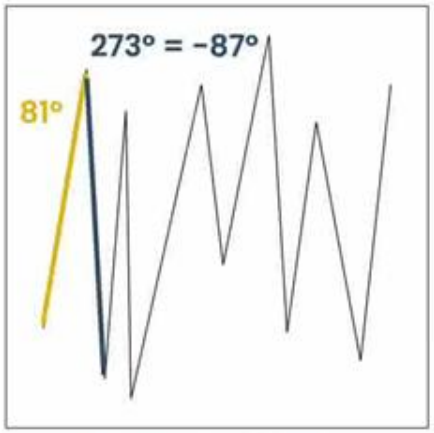

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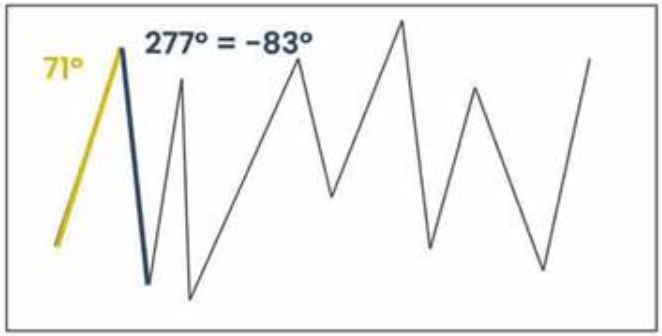

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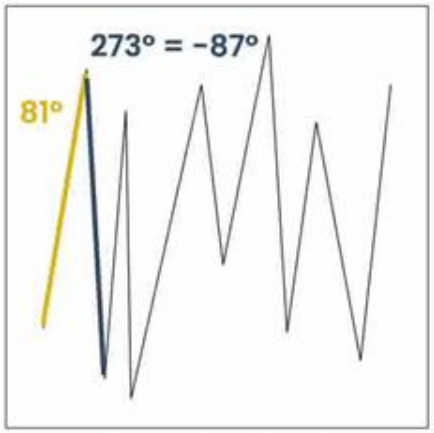
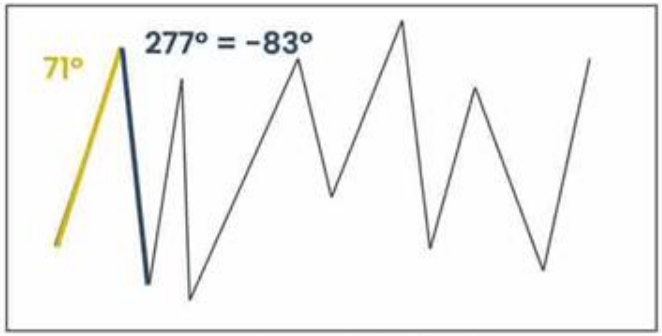


Aspect ratio 1:1

OPTIMIZATION PROBLEM

bank_slopes (ggthemes)



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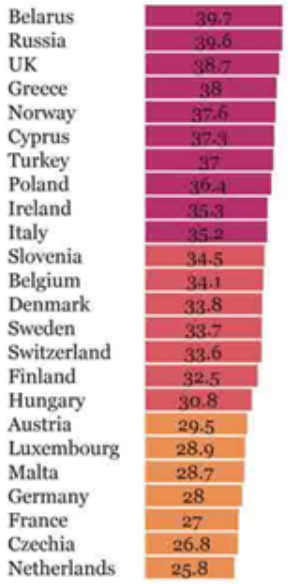
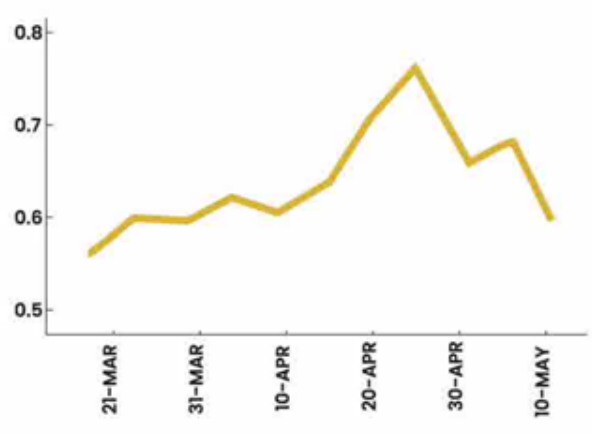
Narrow charts suggest **vertical** reading:



SOURCE: @MILOSAGATHON

Wide charts suggest **horizontal** reading:



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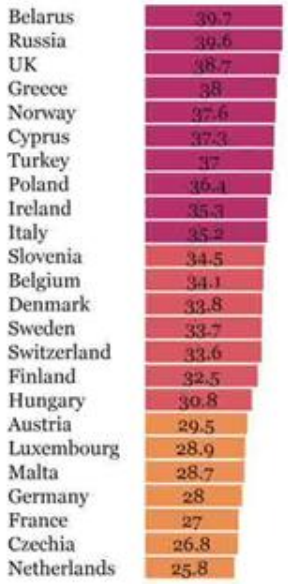

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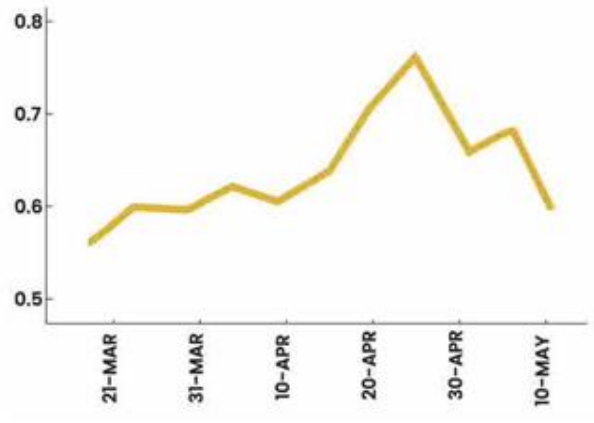
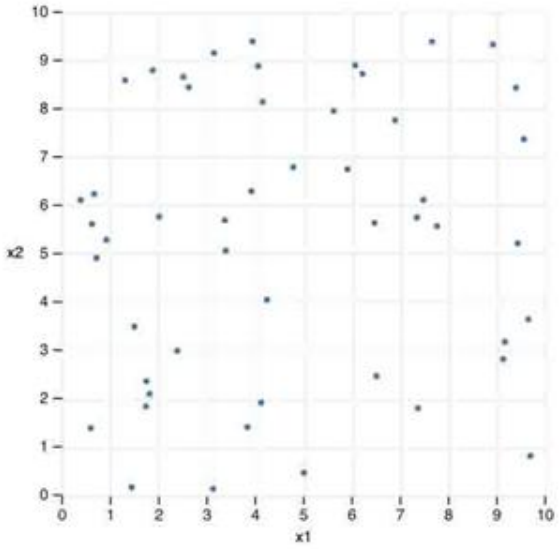


Square charts suggest no preferred direction:



SOURCE: ENRICO BERTINI