

# Levels of Measurement

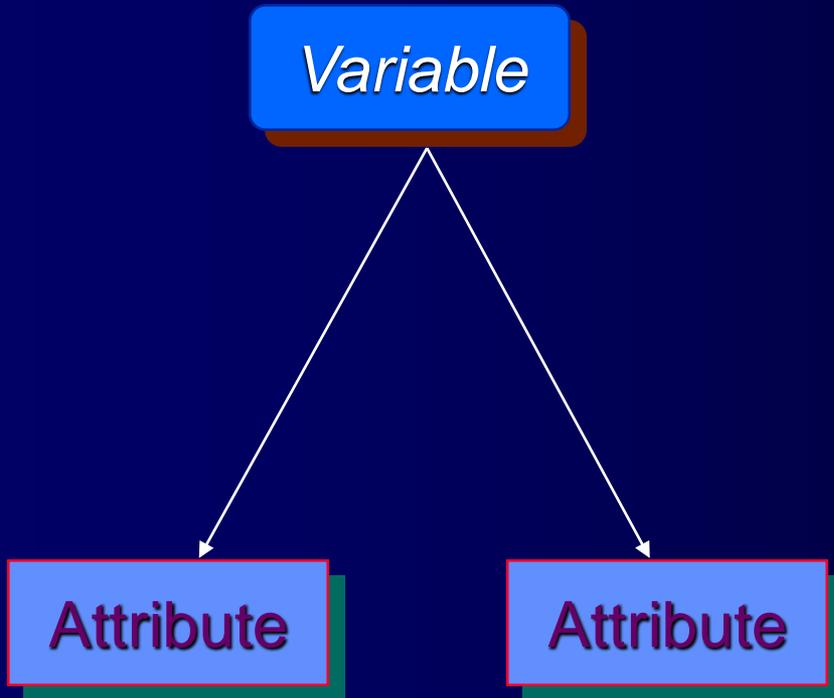
# The Levels of Measurement

- Nominal
- Ordinal
- Interval
- Ratio

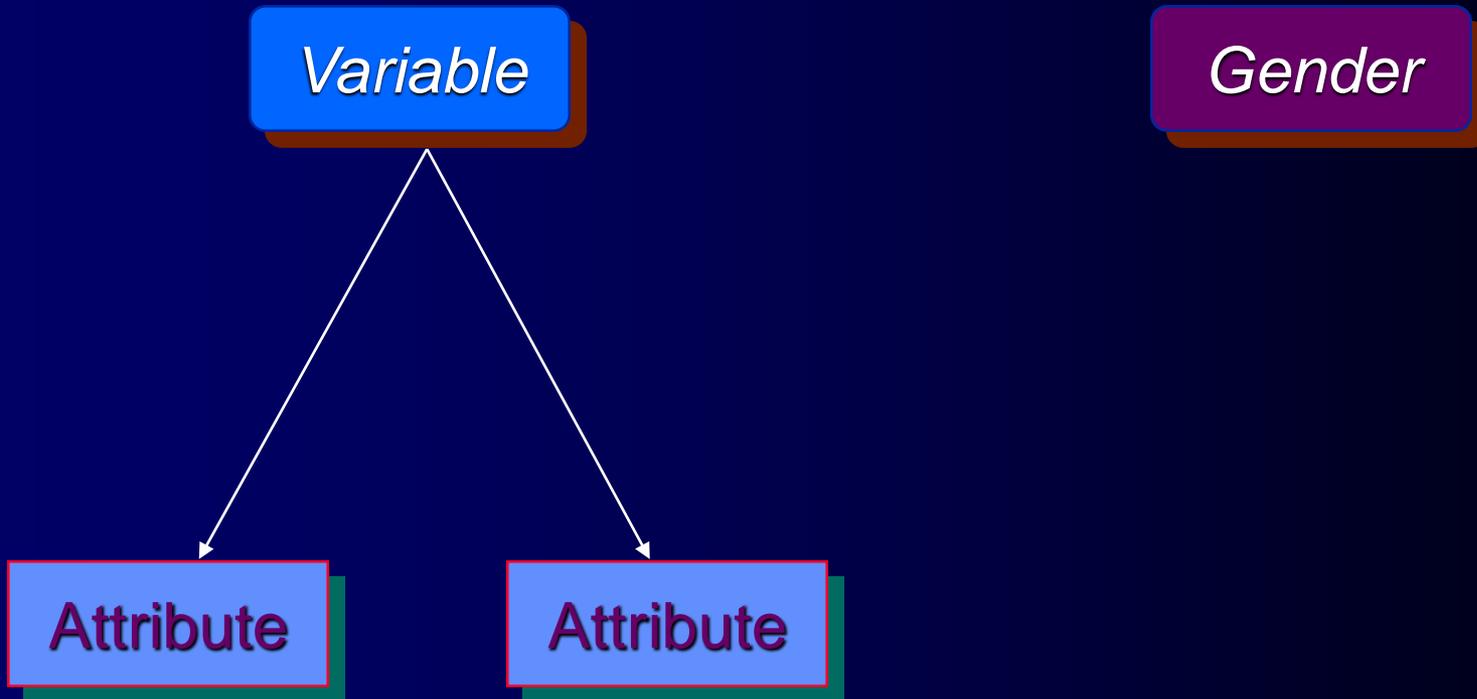
# Some Definitions

*Variable*

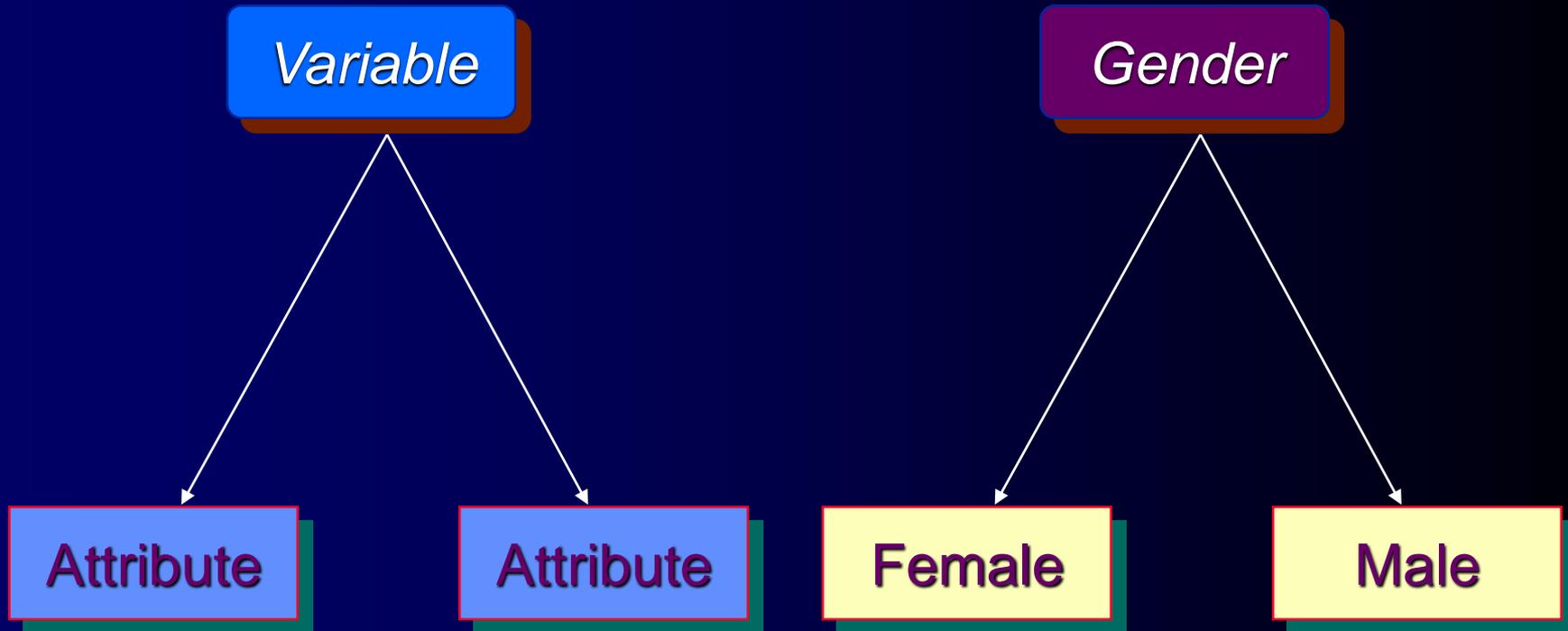
# Some Definitions



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# Qualities of Variables

- **Exhaustive** -- Should include all possible answerable responses.
- **Mutually exclusive** -- No respondent should be able to have two attributes simultaneously (for example, employed vs. unemployed -- it is possible to be both if looking for a second job while employed).

# What Is Level of Measurement?

*The relationship of the values that are assigned to the attributes for a variable*

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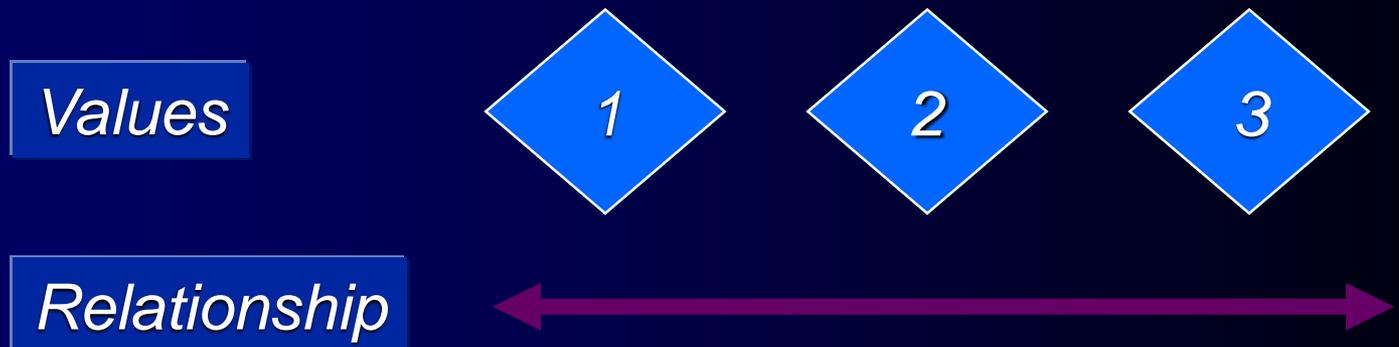
*The **relationship** of the values that are assigned to the attributes for a variable*

*Relationship*



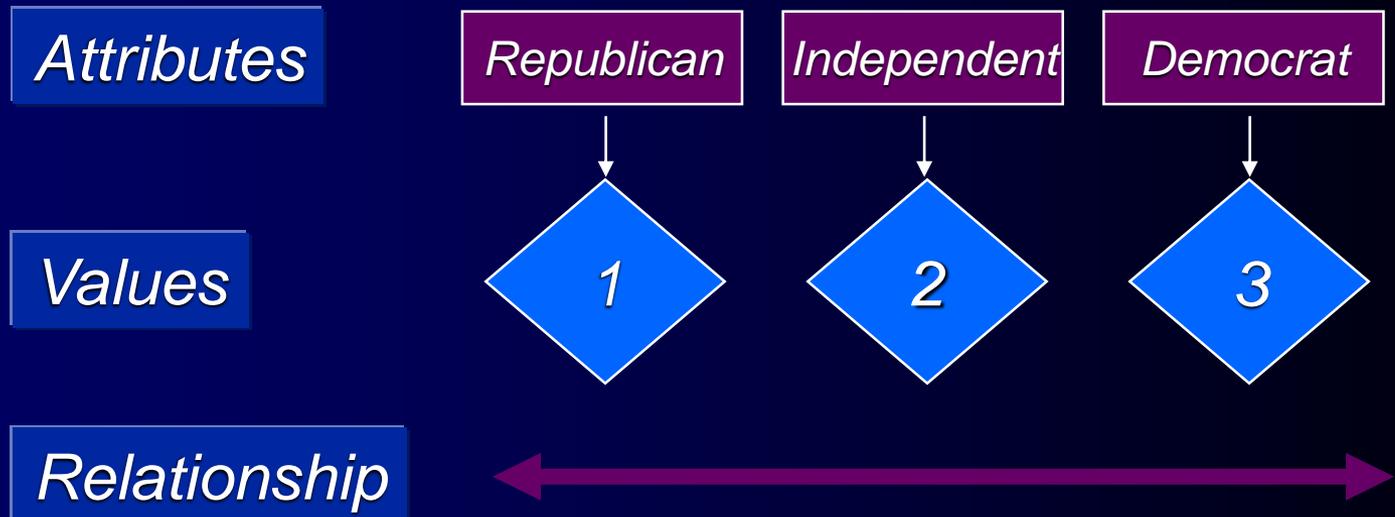
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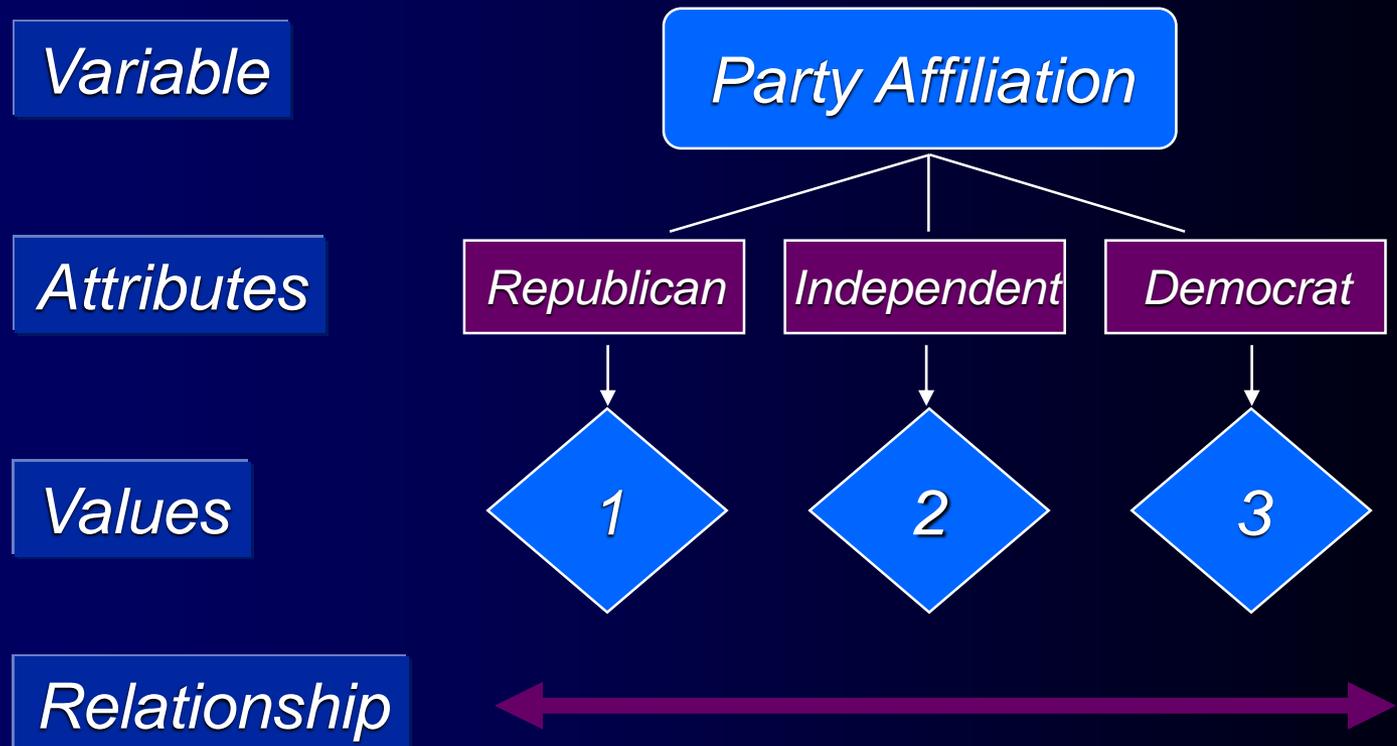
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*The relationship of the values that are assigned to the attributes **for a variable***



# Why Is Level of Measurement Important?

- Helps you decide what **statistical analysis** is appropriate on the values that were assigned
- Helps you decide how to **interpret** the data from that variable

# Nominal Measurement

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- The values “**name**” the attribute uniquely.
- The value does **not** imply any ordering of the cases, for example, jersey numbers in football.
- Even though player 32 has **higher number** than player 19, you can't say from the data that he's **greater** than or **more** than the other.



# Ordinal Measurement

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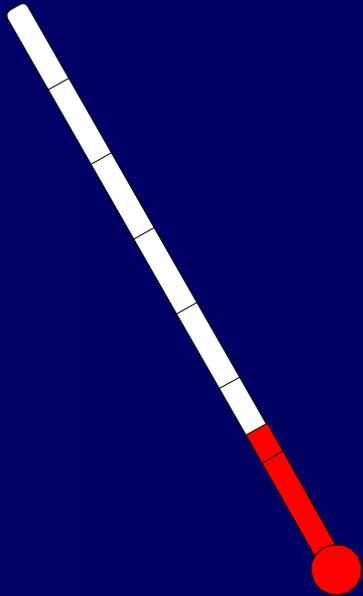
Is the distance from 0 to 1 the same as 3 to 4?

# Interval Measurement

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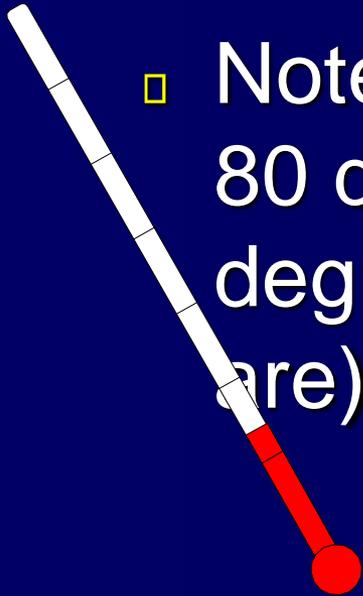
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- Note that **ratios don't make any sense** -- 80 degrees is not **twice** as hot as 40 degrees (although the attribute values are).



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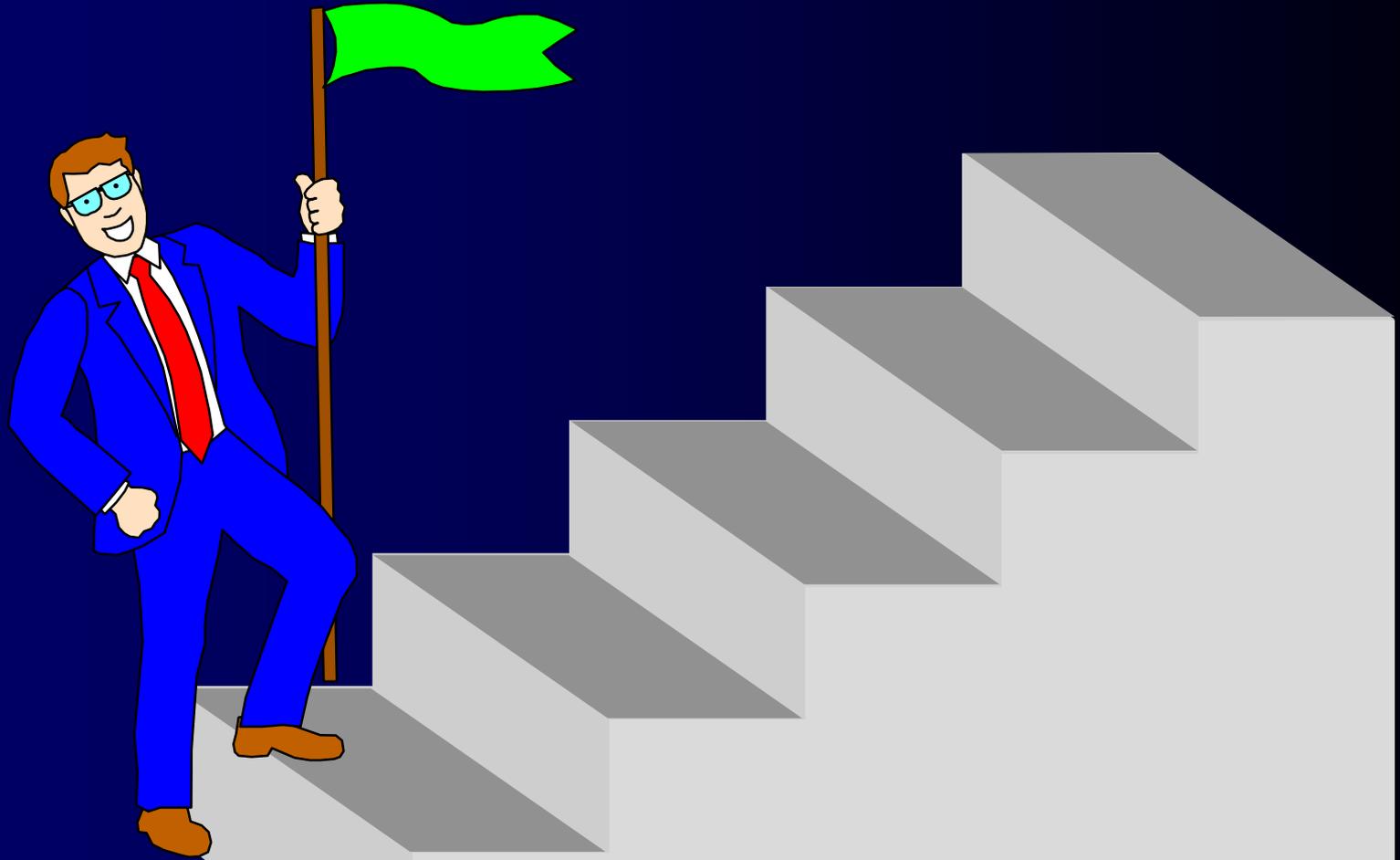
- Has an **absolute zero** that is meaningful
- Can construct a meaningful **ratio** (fraction), for example, number of clients in past six months
- It is meaningful to say that “...we had **twice** as many clients in this period as we did in the previous six months.

# The Hierarchy of Levels



**Nominal**

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**Nominal**

*Attributes are only named; weakest*

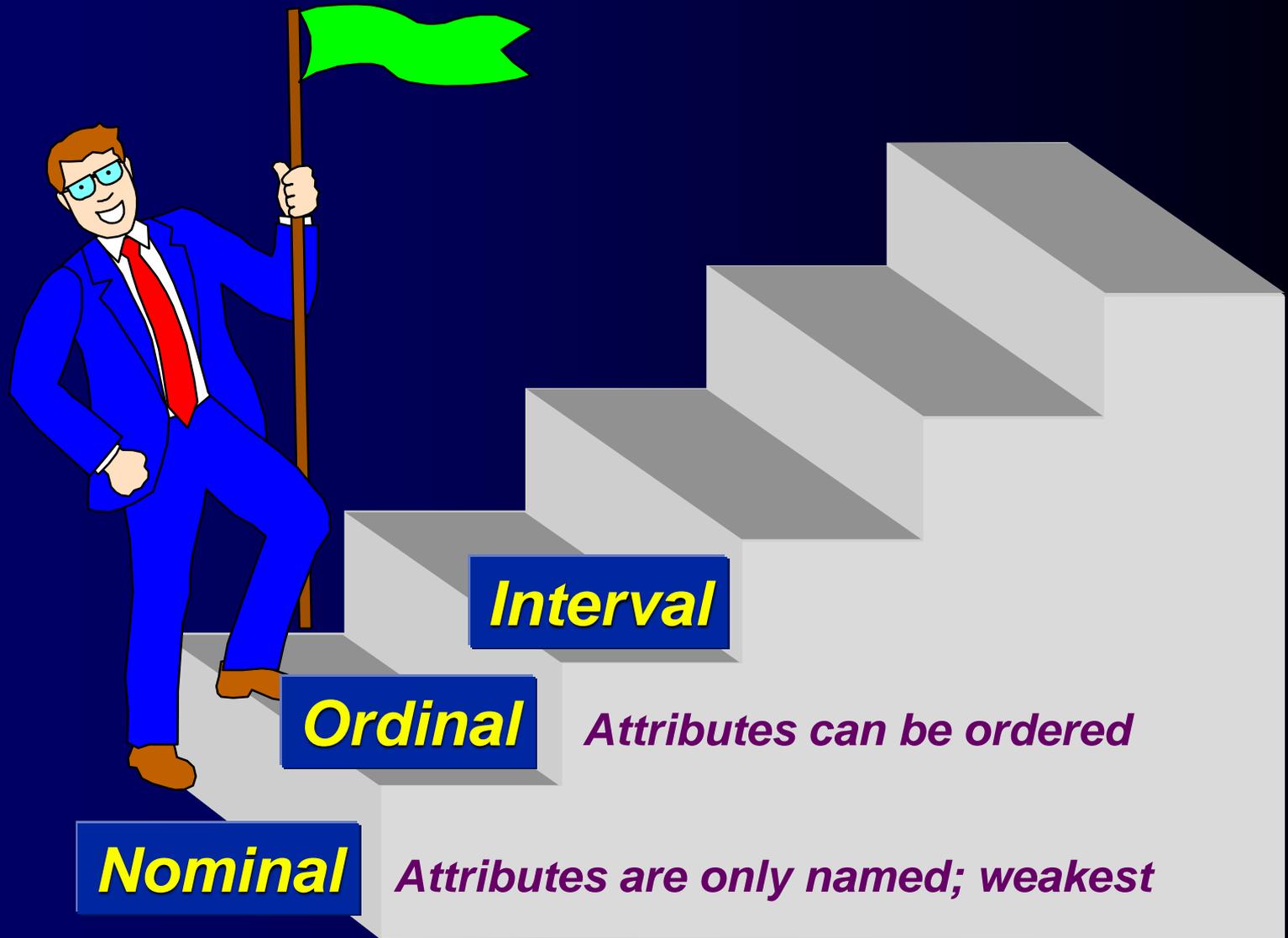
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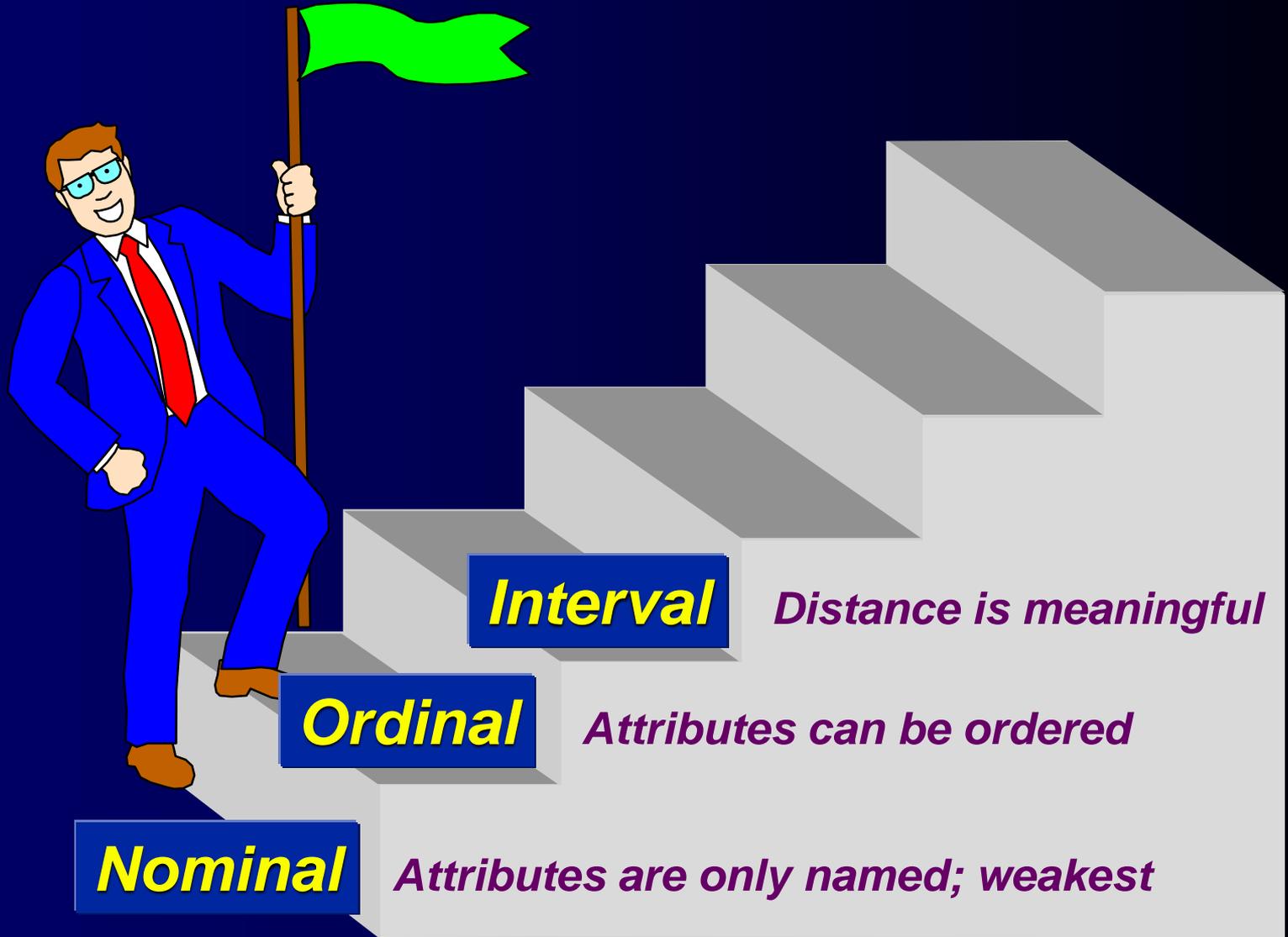
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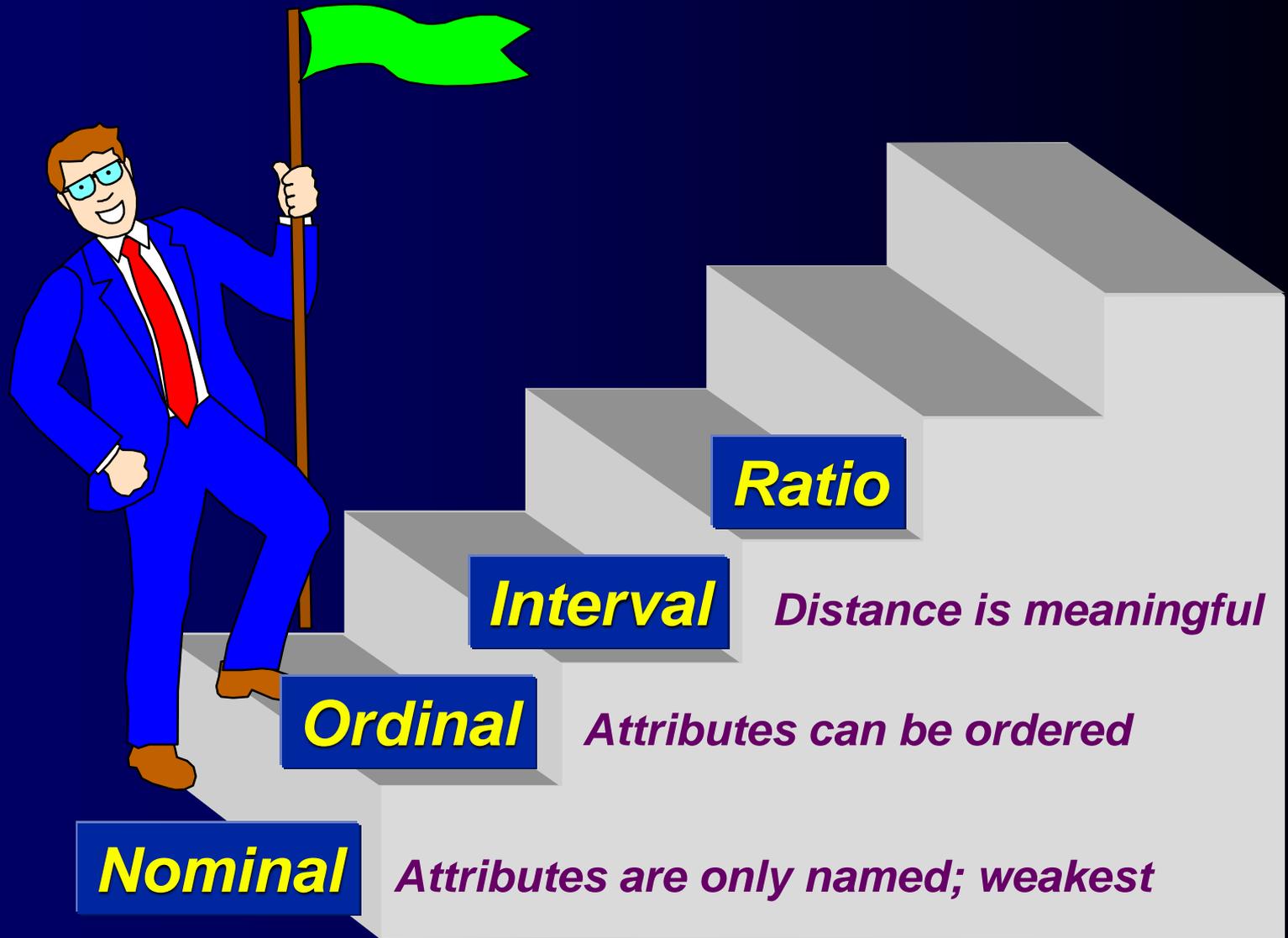
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