

LEVELS OF MEASUREMENT

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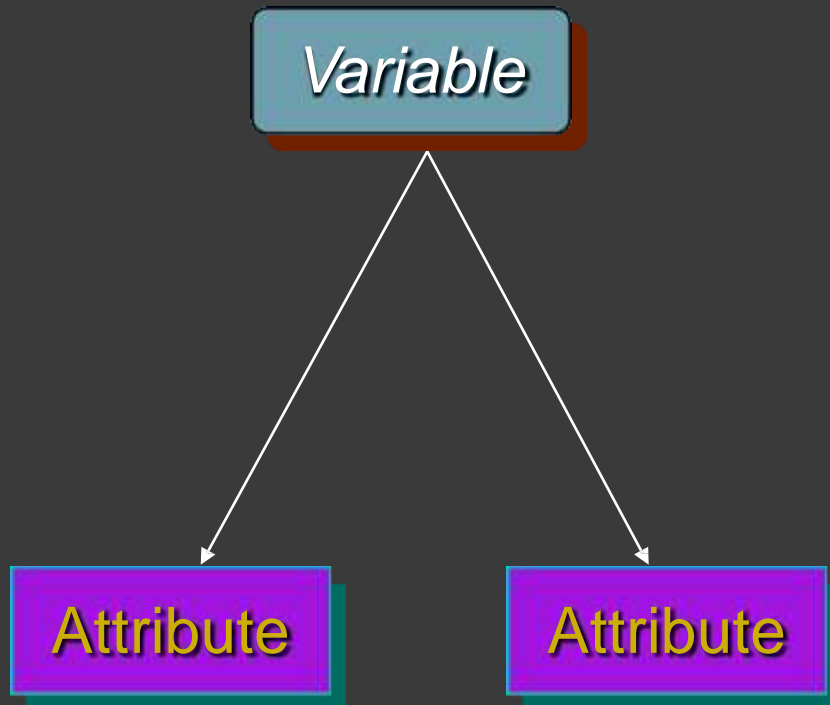
The Levels of Measurement

- ⦿ Nominal
- ⦿ Ordinal
- ⦿ Interval
- ⦿ Ratio

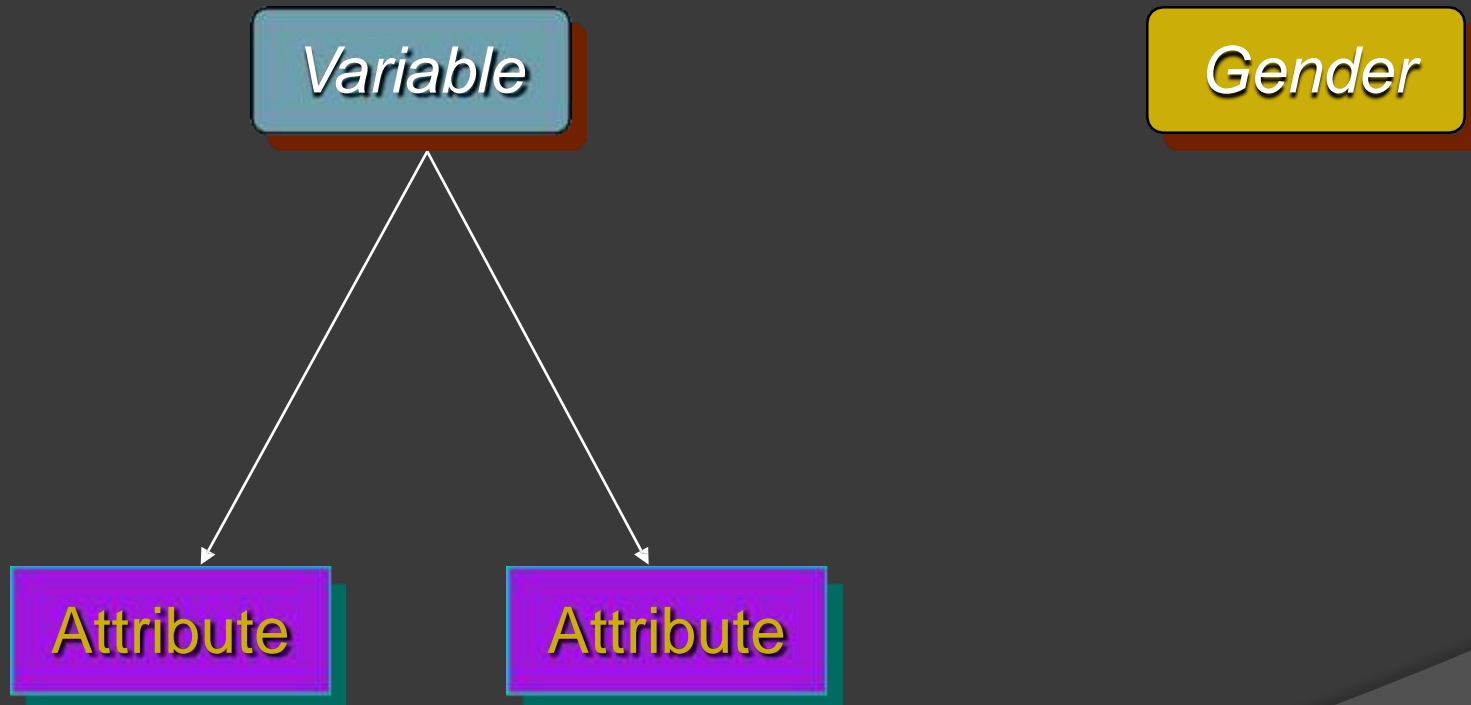
Some Definitions

Variable

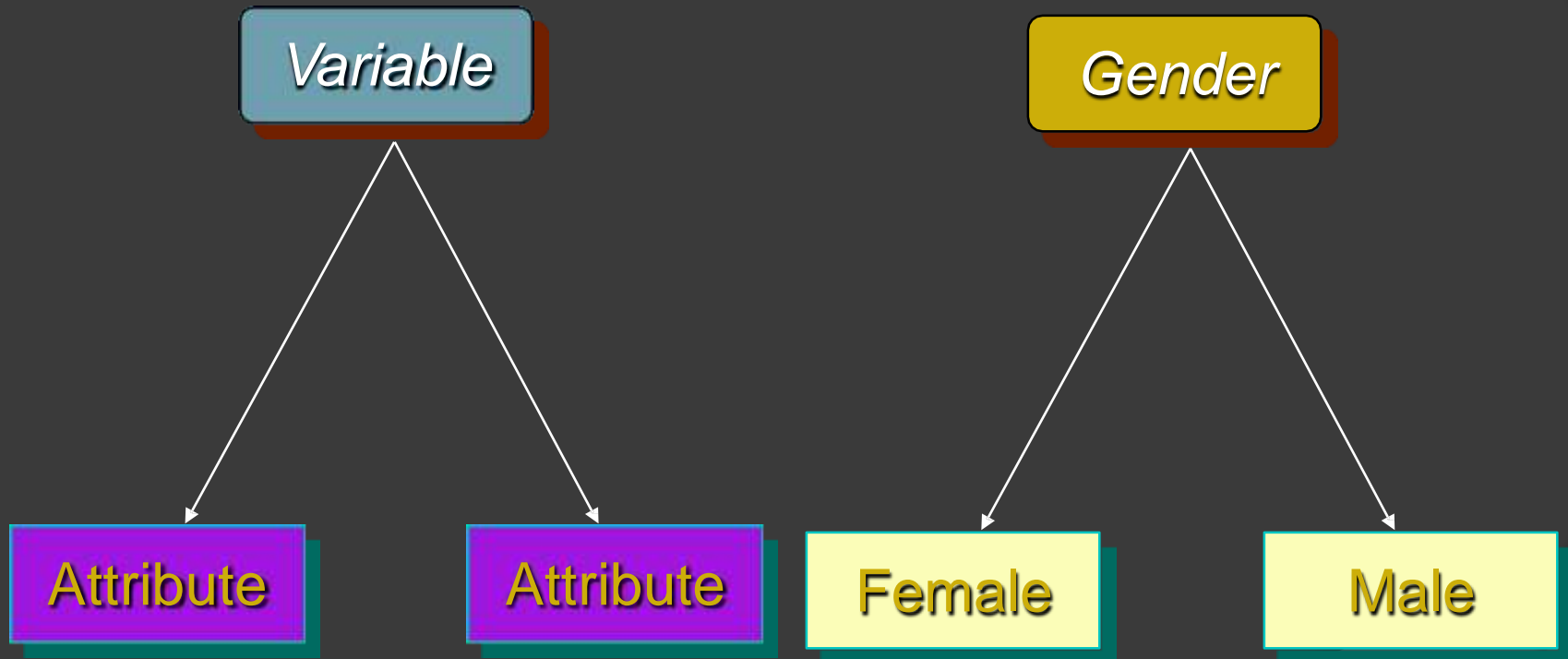
Some Definitions



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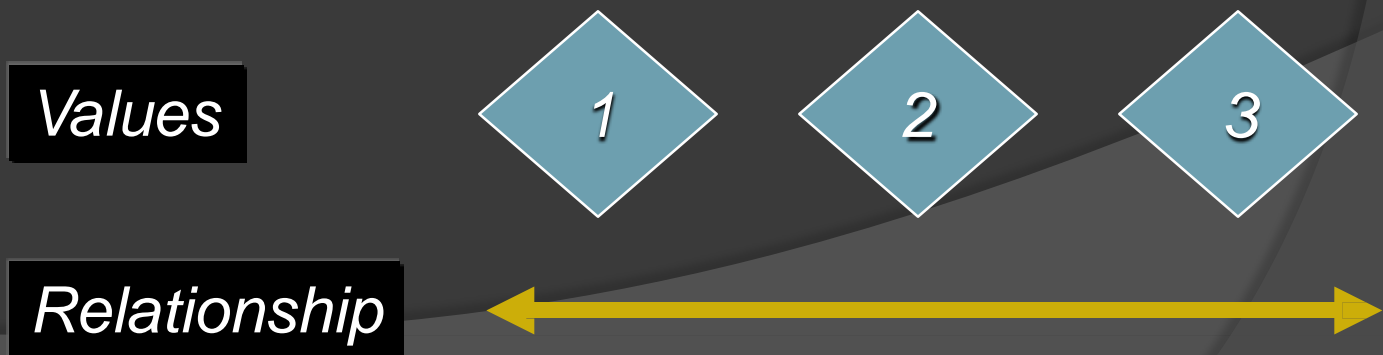
*The **relationship** of the values that are assigned to the attributes for a variable*

Relationship



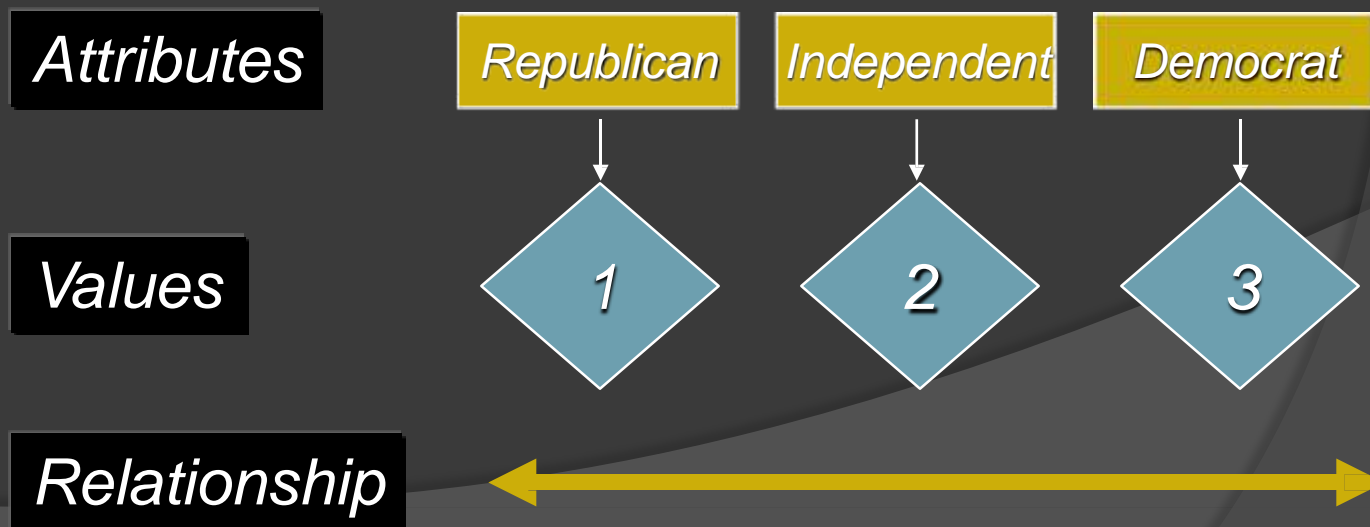
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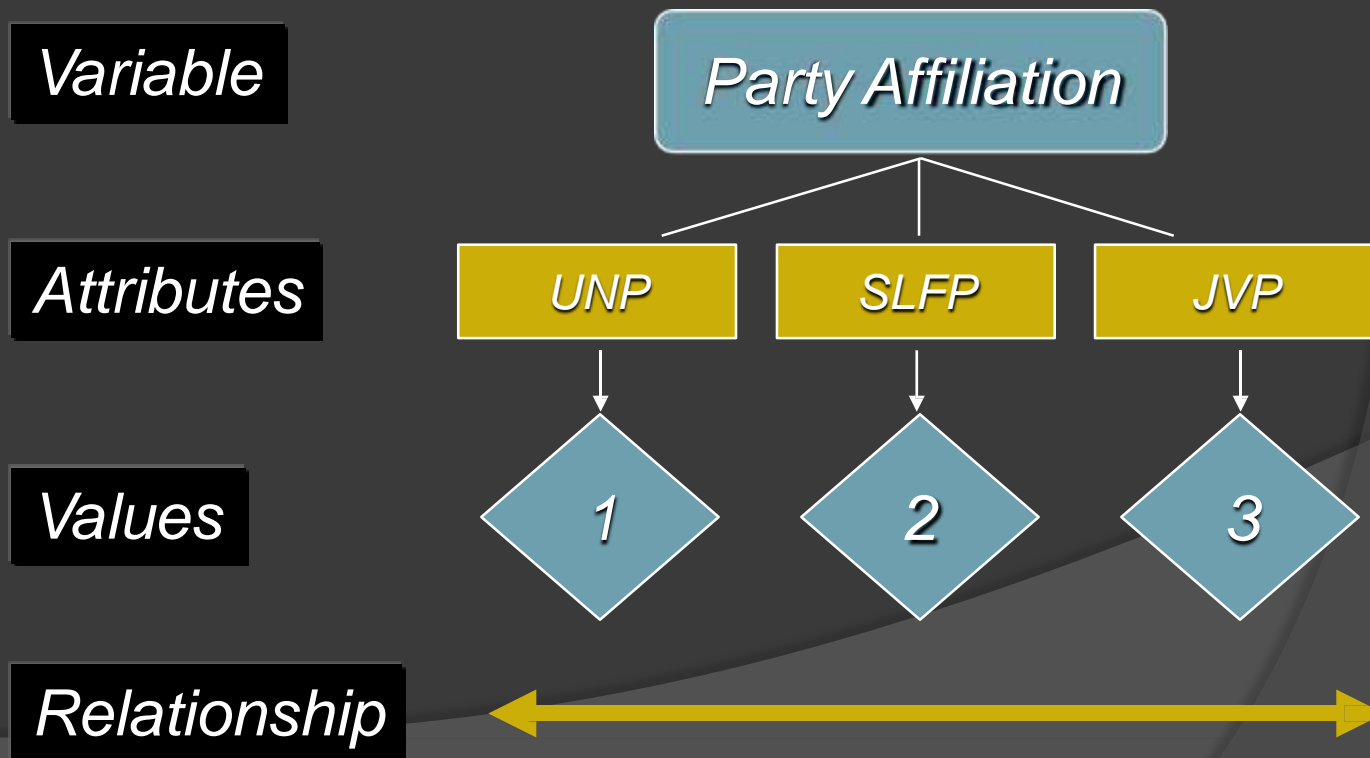
What Is Level of Measurement?

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



What Is Level of Measurement?

*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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Nominal Measurement

- 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

When attributes can be **rank-ordered**...

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- ⦿ Distances between attributes **do not have any meaning.**

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Ordinal Measurement

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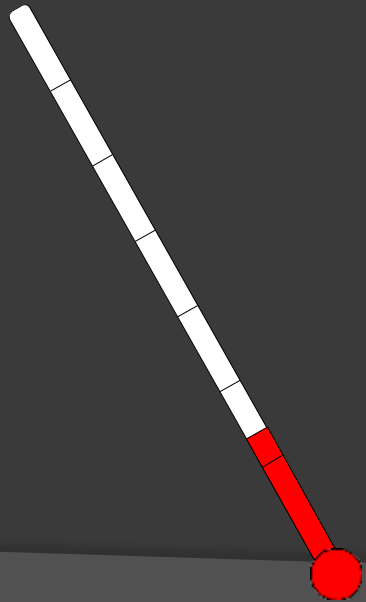
Is the distance from 0 to 1 the same as 3 to 4?

Interval Measurement

When **distance** between attributes has meaning...

Interval Measurement

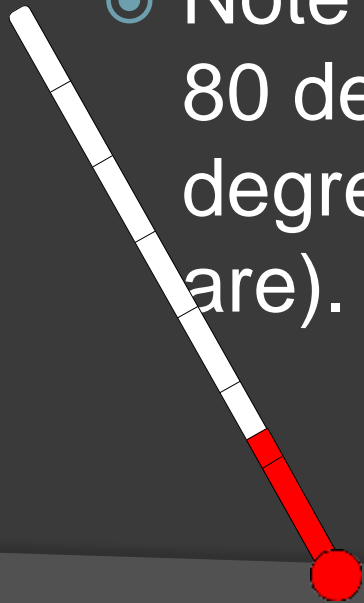
When **distance** between attributes has meaning, for example, temperature (in Fahrenheit) -- distance from 30-40 is same as distance from 70-80



Interval Measurement

When **distance** between attributes has meaning, for example, temperature (in Fahrenheit) -- distance from 30-40 is same as distance from 70-80

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



Ratio Measurement

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Ratio Measurement

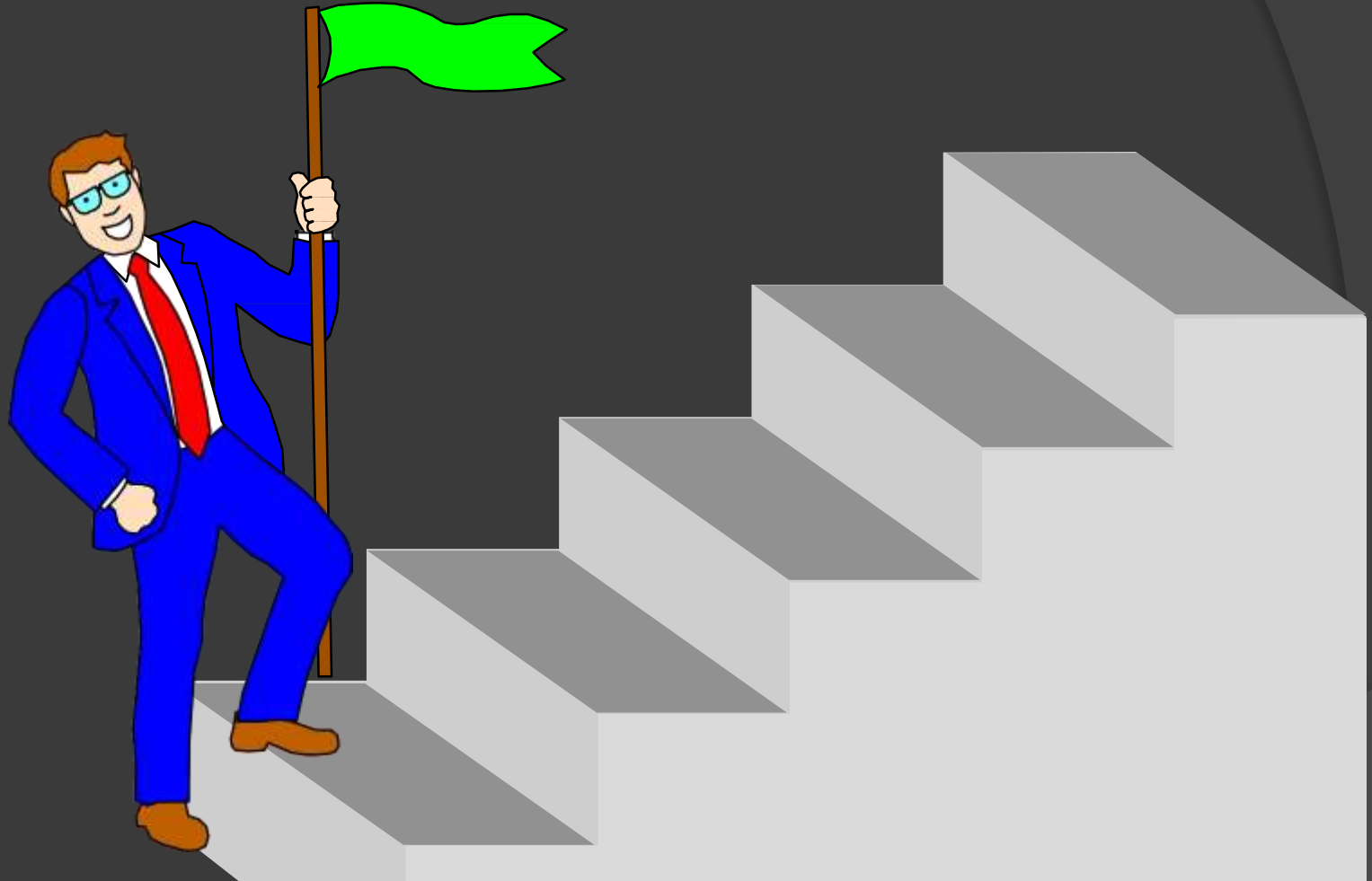
- ⦿ Has an **absolute zero** that is meaningful
- ⦿ Can construct a meaningful **ratio** (fraction), for example, number of clients in past six months
- ⦿ It is meaningful to say that “...we had **twice** as many clients in this period as we did in the previous six months.

The Hierarchy of Levels



Nominal

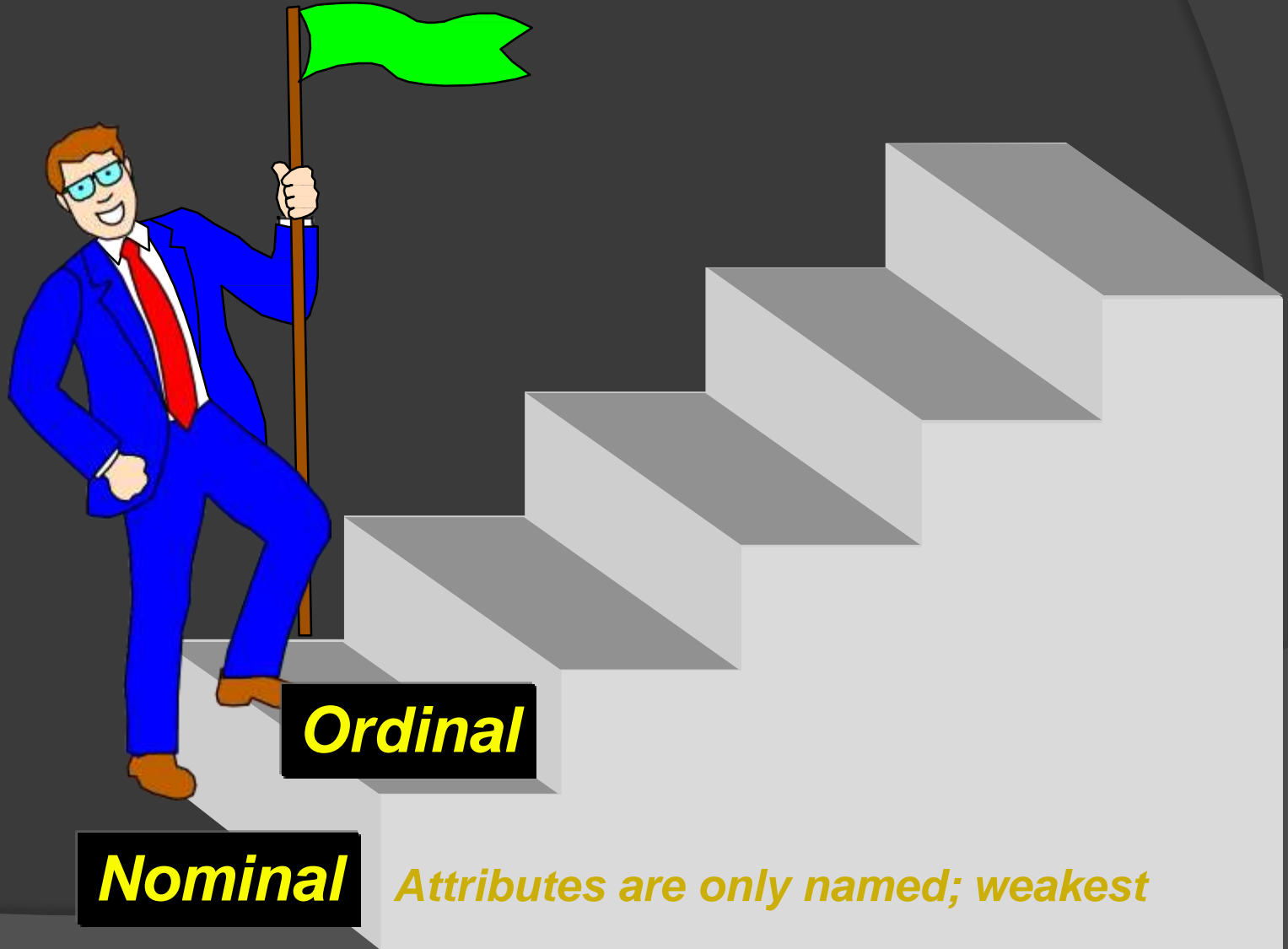
The Hierarchy of Levels



Nominal

Attributes are only named; weakest

The Hierarchy of Levels

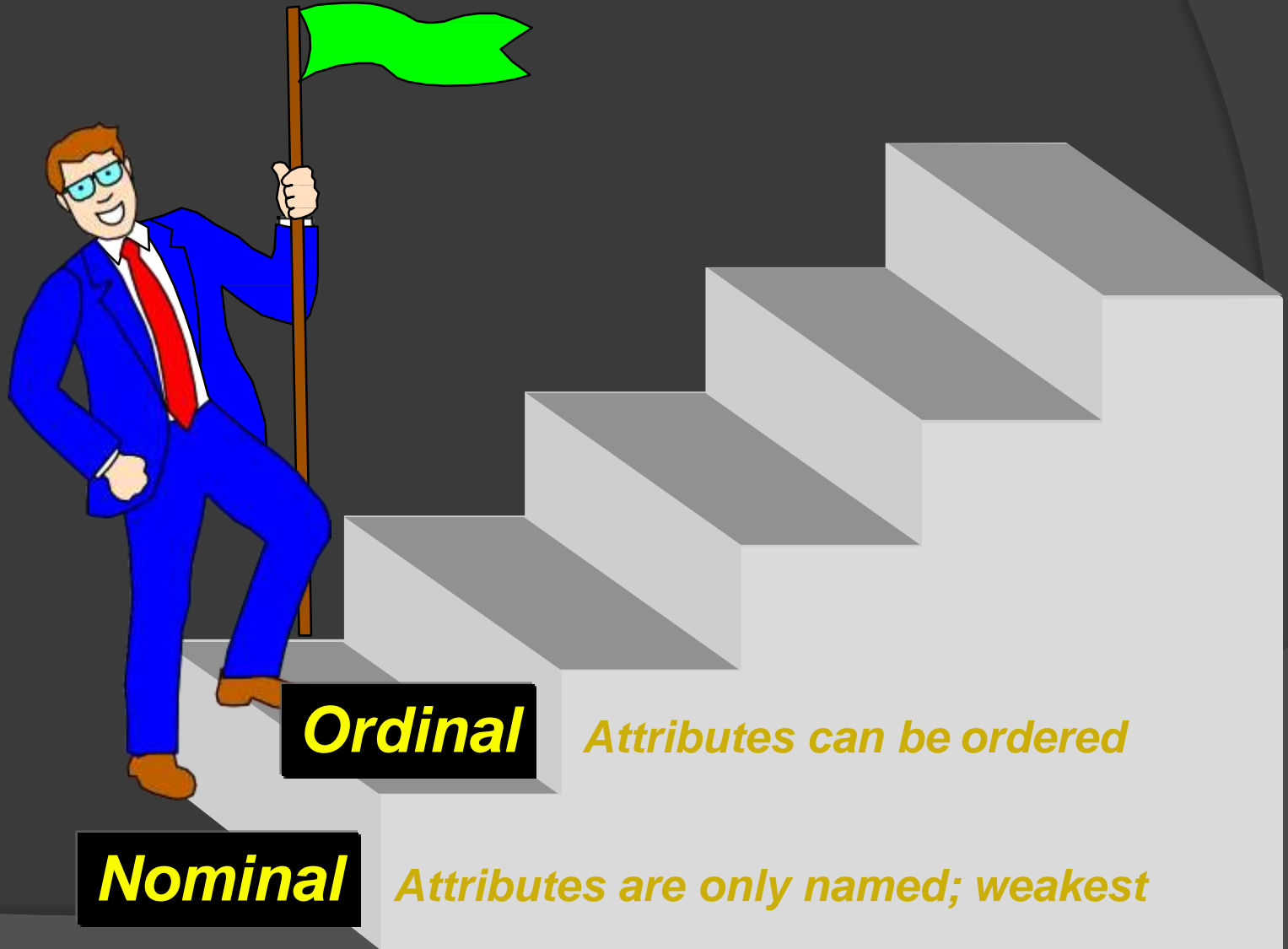


Ordinal

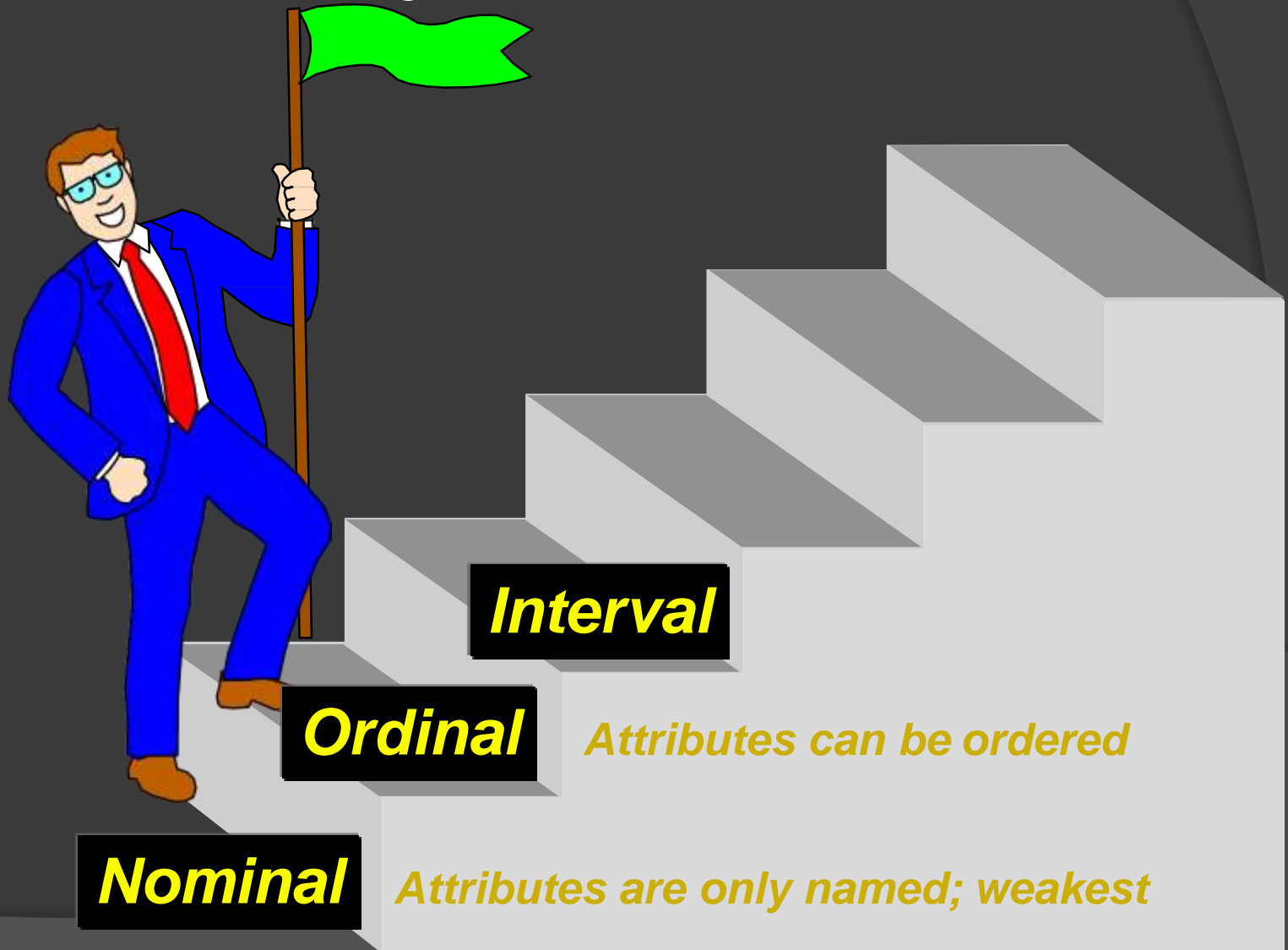
Nominal

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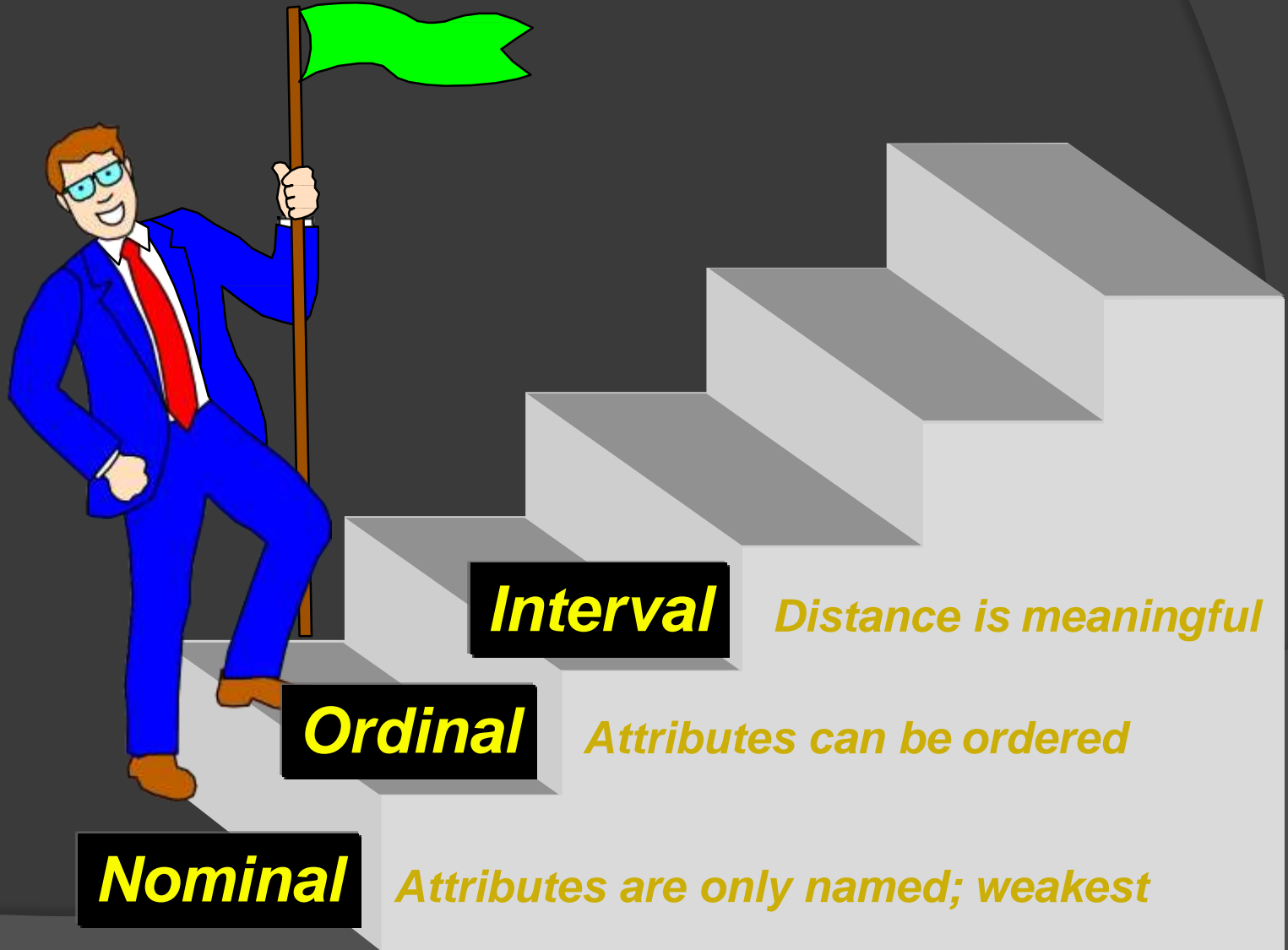
The Hierarchy of Levels



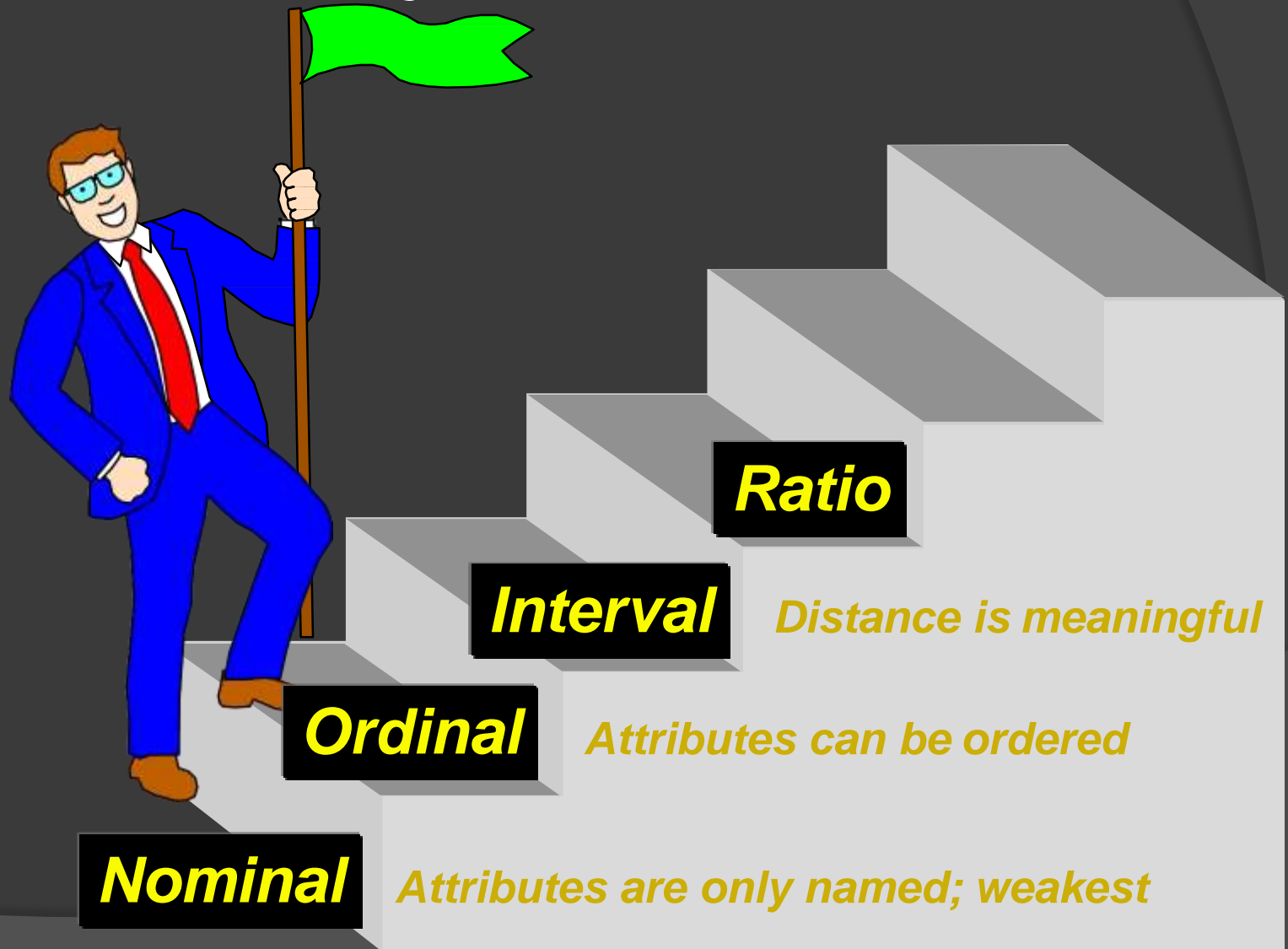
The Hierarchy of Levels



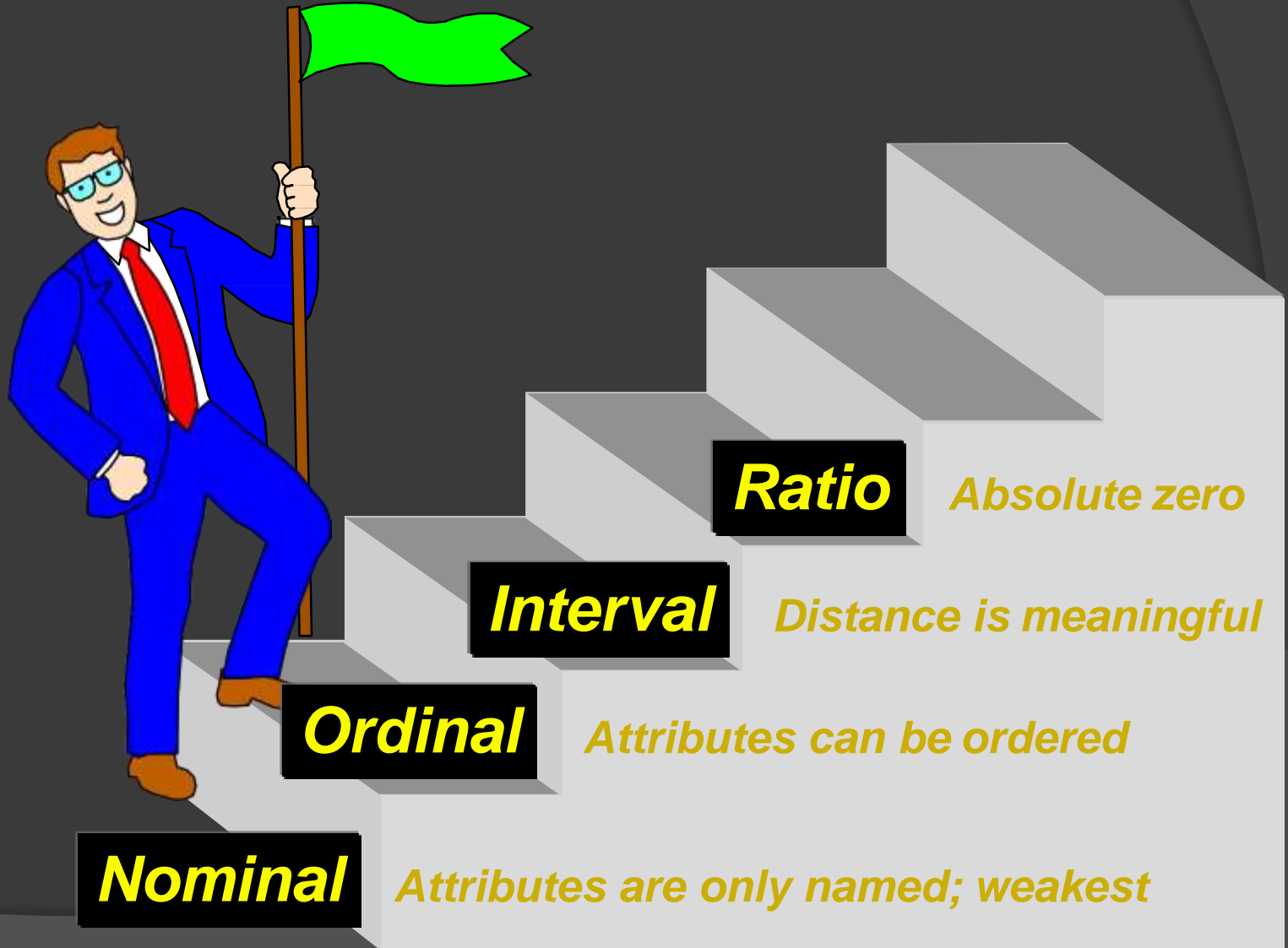
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Thank You !

