Fixed- and Floating-Point Data Types

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Fixed- and Floating-Point Data Types

number:	precision	
10.523	5	

precision

refers to the number of digits in a number

Fixed- and Floating-Point Data Types

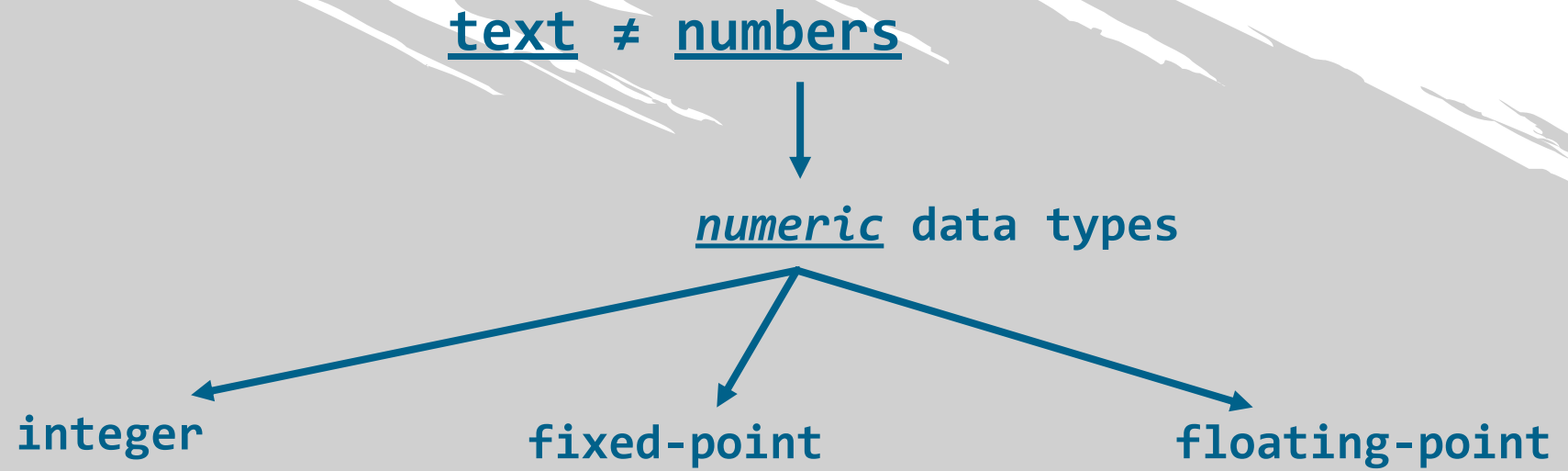| number:	precision	scale	
10.523	5	3	

scale

refers to the number of digits to the right of the decimal point in a number

Fixed- and Floating-Point Data Types

number:	precision	scale	
10.523	5	3	
36.875	5	3	

e.g. DECIMAL (5 , 3)

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Fixed- and Floating-Point Data Types

text ≠ numbers

⬇

numeric data types

integer   fixed-point   floating-point

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Fixed- and Floating-Point Data Types

- **fixed-point data** represent **exact values**

DECIMAL (5 , 3)	10.523
10.5	10.500
10.5236789	10.524 ⚠

Fixed- and Floating-Point Data Types

- **fixed-point data** represent **exact values**

  when only one digit is specified within the parentheses, it will be treated as the precision of the data type

  DECIMAL (7)

  1234567

  DECIMAL (7, 0)

Fixed- and Floating-Point Data Types

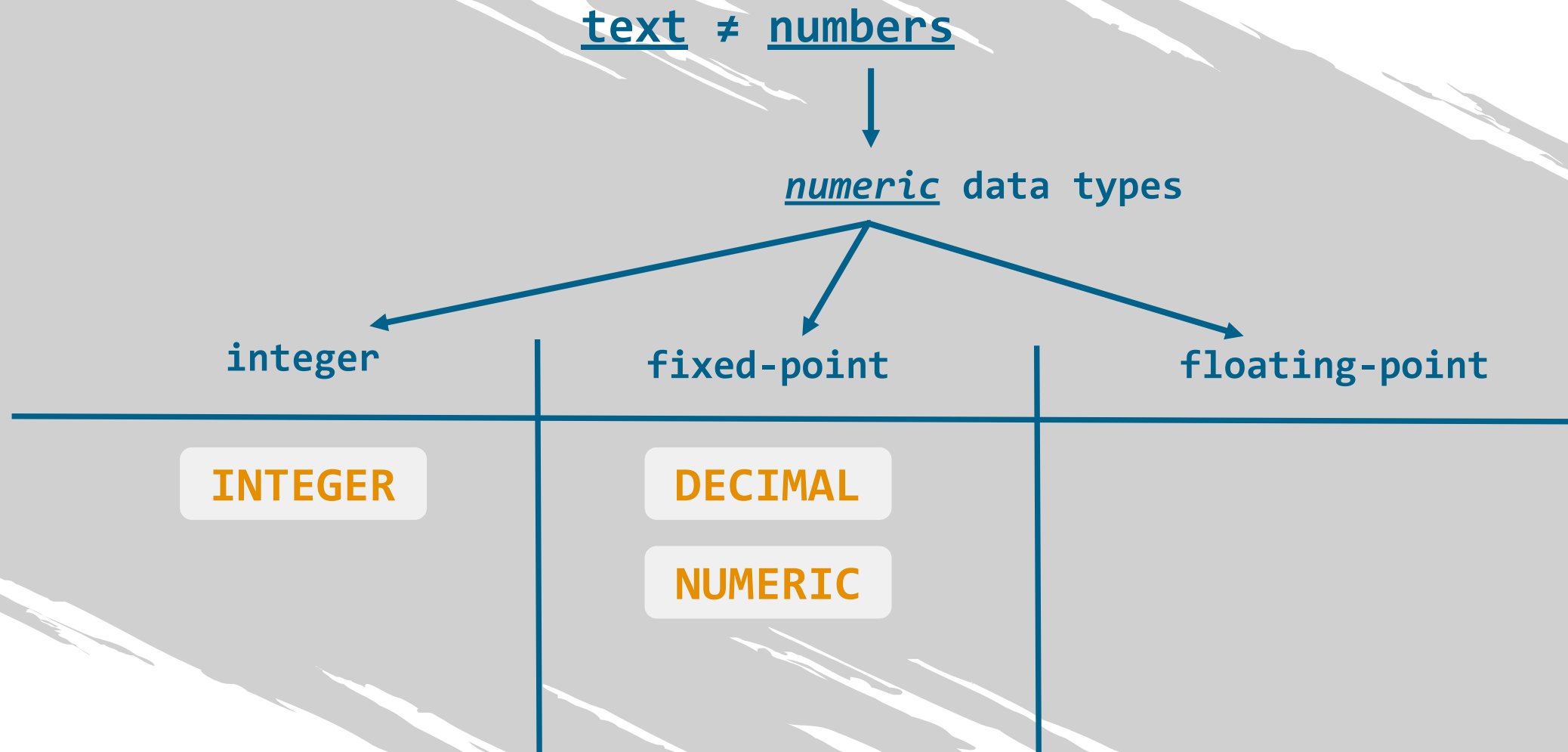- **fixed-point data** represent **exact values**

  DECIMAL has a synonymous data type. It is called NUMERIC.

  DECIMAL = NUMERIC

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Fixed- and Floating-Point Data Types

text ≠ numbers

↓

numeric data types

integer   fixed-point   floating-point

integer	fixed-point	floating-point
INTEGER	**DECIMAL**	
	NUMERIC	

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Fixed- and Floating-Point Data Types

DECIMAL = **NUMERIC**

e.g. salaries

NUMERIC (p , s)

precision: **p** = 7

scale: **s** = 2

---

e.g. **NUMERIC (7,2)** $ 75,000.50

Fixed- and Floating-Point Data Types

- **floating-point data type**

  - used for approximate values only

  - aims to balance between range and precision (=> "floating")

FLOAT (5 , 3)	10.523
10.5236789	10.524 ❌
	(10.524 is an approximate value)

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Fixed- and Floating-Point Data Types

the main difference between the fixed- and the floating-point type
is in the way the value is represented in the memory of the computer
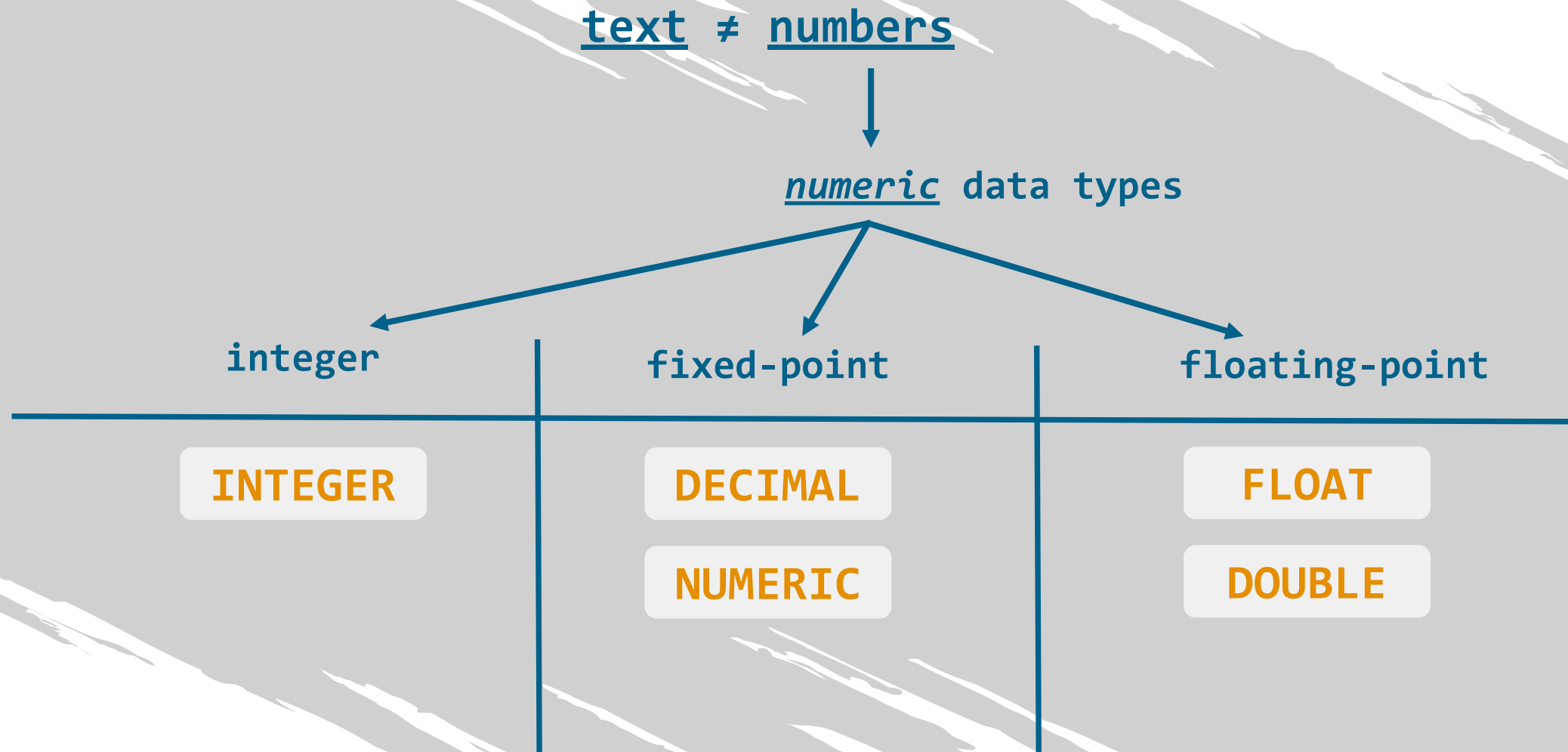
DECIMAL (5 , 3)

10.5236789   10.524   ⚠️

FLOAT (5 , 3)

10.5236789   10.524   ❌

Fixed- and Floating-Point Data Types

text ≠ numbers

↓

numeric data types

integer	fixed-point	floating-point
INTEGER	DECIMAL	FLOAT
	NUMERIC	DOUBLE

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Fixed- and Floating-Point Data Types

Floating-point data type	size (bytes)	precision	maximum number of digits
FLOAT	4	*single*	23
DOUBLE	8	*double*	53

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