Which are valid ML types?

- int
- double
- char
- val
- string
- val
- real
- int * int
- int * char
Compute the cardinality:

$$|\{1, 2, 3, 4, 5\} \cup \{3, 4, 5, 6\}|$$

$$|[0, \pi) \cap \mathbb{Z}|$$

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Which are disjoint?

\( \mathbb{Z} \) and \( \mathbb{R} \)

\( \mathbb{Z} \) and \( \mathbb{R}^- \)

\([0, 5) \) and \([5, 10) \)

*Plants* and *Fungi*

*MathClasses* and *CSCIClasses*

*DeciduousTrees* and *ConiferousTrees*
1.8.1 What is the cardinality of \( \{0, 1, 2, \ldots n\} \)?

1.8.3 One might be tempted to think \(|A \cup B| = |A| + |B|\), but this is not true in general. Why not? (Assume \(A\) and \(B\) are finite.)

1.8.6 Describe three distinct partitions of the set \(\mathbb{Z}\).
1.9.5 Based on our description of the real number plane as a Cartesian product, explain how a line can be interpreted as a set.

1.9.6 Explain how \( \mathbb{C} \), the set of complex numbers, can be thought of as a Cartesian product.

1.9.7 Any rational number (an element of set \( \mathbb{Q} \)) has two integers as components. Why not rewrite fractions as ordered pairs (for example, \( \frac{1}{2} \) as \((1, 2)\) and \( \frac{3}{4} \) as \((3, 4)\)) and claim that \( \mathbb{Q} \) can be thought of as \( \mathbb{Z} \times \mathbb{Z} \)? Explain why these two sets cannot be thought of as two different ways to write the same set. (There are at least two reasons.)