

Answer the following question with „yes“ or „no“ and provide one explaining sentence!

**Exercise 1** (Floating Point Numbers)

Consider IEEE Double Precision, i.e.  $b = 2$ ,  $p = 53$ ,  $e_{min} = -1021$ ,  $e_{max} = 1024$ .

Is the number  $x = 0.1$  precisely represented, i.e.  $0.1 \in \mathbb{F}(b, p, e_{min}, e_{max})$ ?

**Exercise 2** (Conditioning)

Is the addition of two numbers  $x_1, x_2 \in \mathbb{R}$  with  $|x_1| \approx |x_2|$  always well-conditioned?

**Exercise 3** (Backward Stability)

Does a backward stable algorithm at least give „Nearly the right answer to nearly the right question“?

**Exercise 4** (Newton's Method)

Does a linearly convergent fixed point iteration converge faster than a convergent Newton iteration?