Hometask-4

On your favorite language or C++ implement:

1. `Matrix` class
    - Use templates/generics to define size and base type
    - Implement transpose operation
    - Implement sum operation (or override operators `+` and `-`)
    - Implement scalar multiply by scalar operation
    - Implement matrix Kelly multiplication ($O(nmk)$ complexity)
2. Define `Vector` as Matrix specialization/subclass (as a column matrix)
    - Implement function `scalarProduct`, that multiplies two vecotrs, as `Matrix` static method (why? we'll learn later)
3. Implement Gauss algorithm on top of this
4. **Def**: Column rank — number of lineary independent columns in matrix. How to find matrix rank using Gauss method? (Prove that rank does not change with primitive operations. Take a look at LU decomposition.)
5. Implement `rank` method of `Matrix` class