Universität des Saarlandes
FR 6.1 Mathematik
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1. Exercises for Algebraic Numbertheory

The rings on this sheet are commutative and have a 1.

Exercise 1.

Let $R \subseteq S$ be an integral ringextension and S and integral domain . Show that R is a field if and only if S is a field.
What goes wrong, if S is not an integral domain?

Exercise 2.

Let R be a ring and $n \in \mathbb{N}$. We consider R as a subring of R^n via $r \mapsto (r, r, \ldots, r) \in R^n$. Show, that R^n is an integral ring extension of R (by that embedding).
Hint: Start with $n = 2$. Then you can use induction.

The exercises will be discussed in the question session at Monday the 06. 11. 2017 in SR9 at 14 (ct) before the presence exercises.