How to construct explicitly vector valued modular forms and Jacobi forms

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Abstract. In various theories one needs to construct explicitly spaces of vector valued elliptic modular forms. Examples for such theories are algebraic quantum field theory (where vector valued modular forms occur as traces of representations of infinite dimensional Lie algebras) or the geometry of moduli spaces in algebraic geometry (where vector valued modular forms occur in the construction of functions with distinguished divisors using Borcherds products or Gritsenko lifts). A recent theorem shows that vector valued modular forms can always be realized as Jacobi forms. For the latter there are various efficient constructions available. In this talk we explain the mentioned theorem, various constructions for Jacobi forms, and we show how to assemble everything to obtain useful explicit formulas for the objects mentioned in the title.