Binary matrices not containing a smaller matrix as a submatrix have become an interesting topic recently. In my thesis, I introduce two new algorithms to test whether a big square binary matrix contains a smaller binary matrix together with a process using randomness, which approximates a uniformly random matrix not containing a given matrix. The reason to create such algorithms is to allow researchers test their conjectures on random matrices. Thus, my thesis also contains an effective cross-platform implementation of all mentioned algorithms.