

# MR — Macaulay Resultant Package for Maple

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**Software name:** MR

**Short description:** The software package MR for Maple, Versions 7 and 8, contains an implementation of Macaulay's algorithm for computing the dense multi-variable resultant of a list of multivariate polynomials. Some of the features provided by this software package are:

- Optionally computes generalized characteristic polynomials.
- Optionally self-profiling (timing, tracing).
- Well integrated with Maple's LinearAlgebra package.

**Public access:** <http://minimair.org/MR.mpl>

## Abstract

The software package MR for Maple, Versions 7 and 8, contains an implementation of Macaulay's algorithm for computing the dense multi-variable resultant ([MC93], [Min02]) of a list of multivariate polynomials. An extended list of some of the features is:

- Designed independently from the coefficient ring of the input polynomials.
- Optimized for polynomials with coefficients being integer polynomials.
- Optionally computes generalized characteristic polynomials.
- Optionally self-profiling (timing, tracing).

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- Well integrated with Maple’s LinearAlgebra package.
- Designed to emulate overloading, according to the type of the input, of the main sub-functions, while not sacrificing efficiency.

It is important to point out that there are other resultant packages available for Maple (see e.g. [Tri02], [WME98], [BM02]). However, they do not provide the full range of features of the current package, MR, and they are not designed for the most recent versions of Maple. Therefore the author believes that the current package is of great interest to the symbolic computation community.

## Usage

We briefly describe how the package MR is to be used in Maple.

The main function, exported by the package MR, is called as

```
MR:-MResultant(plist, vlist, options);
```

The input argument “plist” is a list of not necessarily homogeneous polynomials. The variables of these polynomials are contained in the list “vlist”. The symbol “options” stands for a sequence of optional arguments. These optional arguments are described in detail in <http://minimair.org/MR.mpl>. If called without optional arguments, the main function returns the Macaulay (multi-variable) resultant of the polynomials in “plist” with respect to the variables in “vlist”.

## References

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