NQ

A GAP4 Package

On Nilpotent Quotients

version 1.0

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1 The Nilpotent Quotient Package

This chapter describes the Interface to the ANU Nilpotent Quotient Program. Some functions rely on the functionality of the `polycyclic` package and cannot be used if this package is not installed.

For easy reference, define the lowere central sreis of a group G by $G_1 = G$ and $G_{i+1} = [G, G_i]$ for $i \geq 1$.

1.1 The main functions

The following functions are available and require the presence of the `polycyclic` package.

1 ▶ `NilpotentQuotient(` *fp group*`,` *class* `)`

2 ▶ `NilpotentQuotient(` *output filename*`,` *fp group*`,` *class* `)`

3 ▶ `NilpotentQuotient(` *input filename*`,` *class* `)`

4 ▶ `NilpotentQuotient(` *output filename*`,` *input filename*`,` *class* `)`

This function computes a polycyclic presentation for G/G_{c+1} where G is the finitely presented group *fp group* and c is the class specified by the parameter *class*. In other words, this function returns the largest nilpotent quotient of the finitely presented group *fp group* of class at most *class*.

5 ▶ `EpimorphismNilpotentQuotient(` *fp group*`,` *class* `)`

This function computes an epimorphism onto G/G_{c+1}. It requires the presence of the `polycyclic` package.

6 ▶ `LowerCentralFactors(` *fp group*`,` *class* `)`

This function computes the abelian invariants of the factors of the lower central series of the given finitely presented group up to nilpotency class *class*.

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This index covers only this manual. A page number in *italics* refers to a whole section which is devoted to the indexed subject. Keywords are sorted with case and spaces ignored, e.g., "`PermutationCharacter`" comes before "permutation group".