

Program Manual

May 17, 2015

1 Preparation

In order for the program to work, the file of the program (the one with extension `.mw`) is needed. In the same folder a file named `Data.txt` is also needed. This file is used as input for the program to run.

Generally, to keep track of all computations, it is advised to copy the folder containing the above files, if a new computation (with different input or parameters) is to be done.

2 Input file

The program accepts as input braid words from the file `Data.txt`. σ_i is notated by i and σ_i^{-1} is notated by i . By successive iterations of a number, any power of σ_i can be represented in this notation. For example, $\sigma_2\sigma_1^2\sigma_3^{-4}$ is written as 2 1 1 -3 -3 -3 -3.

The input file can accept as many words as possible. The limitations are the computing power and the amount of information that is printed in the program after the calculation. It has been noticed that Maple may not respond if the output is too large. Up to 5 words with a reasonable choice of d 's is the most appropriate choice as it seems so far.

3 Configuring computations and output

The first lines of the program contain some configuration options. Any of these must be set to either *true* or *false*. The first half of the options are the following and are all computed in variables (u, z) :

1. `confCalc_uz`: Computes the invariants $\Delta_{d,S}(u, z)$.
2. `confCalcMirror_uz`: Computes the invariants for the mirror images of the given words.
3. `confCompareHomflypt_uz`: Compares all invariants with the HOMFLYPT polynomial, i.e. $\Delta_{d,S}(u, z) - \Delta_{1,\{0\}}(u, z)$.
4. `confCompareHomflyptConj_uz`: Compares all invariants with the HOMFLYPT polynomial where the substitution $z \rightarrow |S|z$ is applied, i.e. $\Delta_{d,S}(u, z) - \Delta_{1,\{0\}}(u, |S|z)$.

5. `confCompareMirror_uz`: Compares the invariants of the mirror images with these of the original words in variables (u, z) .
6. `confCompareMirrorConjSlavik_uz`: Compares the invariants of the mirror images with these of the original words substitution $z \rightarrow -z + \frac{u}{|S|} - \frac{1}{|S|}$ is applied.
7. `confCompareMirrorConjJesus1_uz`: N/A
8. `confCompareMirrorConjJesus2_uz`: N/A

The second half of the options compute the same things, but in variables (u, λ) .

At last there are two options for the d 's. The list `dSet` contains the d 's to compute for. Because of the fact that Maple, does not precisely evaluate the solutions of the E-System for some d 's, it must be instructed to evaluate them as closely as possible. The list `dEval` contains these d 's.

Note that, the list `dSet` must contain $d = 1$ if it is to run comparisons with the HOMFLYPT polynomial. Otherwise, the program will not run properly.

4 Running the program and exporting to PDF

In order to run the program, click on the icon with the three exclamation marks on the toolbar. After some time, the output will be at the end of the file. To export to PDF format, select the menu **File**, then **Export As...** and then select at **Files of Type** the item **PDF (.pdf)**.