Random Magma knowledge

This is a compilation of some useful Magma tricks that I have learned through the years. Thank you to all the wonderful people who have shared their knowledge with me: Eran Assaf, Edgar Costa, Sachi Hashimoto, Avi Kulkarni, Sam Schiavone, Pim Spelier, Drew Sutherland, and John Voight.

- Useful links: Documentation and general examples.
- You can write the first letter of a function and tab complete twice to get a list of possible functions.
- To kill a process, use control + c. To kill Magma, do this twice.
- To ignore >, use SetIgnorePrompt(true);. This is very helpful when you are copying code from the terminal.
- \$1 denotes the last printed result (you can also call \$2 and \$3).
- The rational numbers are not a number field in Magma. You can instead call RationalsAsNumberField();. Careful: linear algebra is slower here.
- When you are debugging functions, you can SetDebugOnError(true);. This will give you access to the "inside" of your function, up to where Magma got stuck. You print things by p whateverYouWant. Use q to quit back to the Magma terminal. You can see all the functions that were used in your computation using bt (shows you the "frames"). Go to a specific frame by writing f theNumberYouWant. Warning: do not use ;.
- In your home directory you can create a file.Magmarc, if does not exist, to have certain commands to run on start. To find the file, you can go to your home directory and press Command + Shift + . (period).
- Use control + e to get to the last character of a line in the terminal. Use control + a for the first one. Do control + k to delete the line. You can also find other combinations here.
- Do %p to print all the Magma session.
- You can search only for signatures without inheritance:

ListSignatures(ModFrmHilElt : Isa := false);. Moreover, you can also just look for functions where your type is an argument or a return values (very useful when you try to find a function producing the type that another function needs...):

ListSignatures(ModFrmHilElt : Search := "ReturnValues", Isa := false);.

• Magma complains about types. Elements need to be coerced to have the type you want. For example, to coerce and integer or type Rational to type Integer: Integers()!r.

- The function Discriminant(K) returns the discriminant of the polynomial used to define, not the discriminant of K. Use Discriminant(RingOfIntegers(K)) to get the discriminant of K.
- Use for verbose: vprintf VerboseLevel : "whatever you want to print";
- To iterate over a list, you can use & + (operation). For example, to add all the prime numbers ≤ 20, do:

&+[p : p in [1..20] | IsPrime(p)];

- To run a magma Jupyter kernel, go to this GitHub repository, and then you can run sage -n jupyter.
- To print in a format that is readable by Magma: Sprint(whateverYouWant, "Magma");.
- To coerce a list into the same set: [Integers() | 4/1, 5/1].
- To load a Magma file line by line do iload "NameOfFile.m";.
- To run computations in a server and be able to go back even when you disconnect, you can use a screen. For commands see this link.
- To set up ssh without a password, use something like this link.

Do you have more random knowledge? Please email it to me and I will add it to this list!