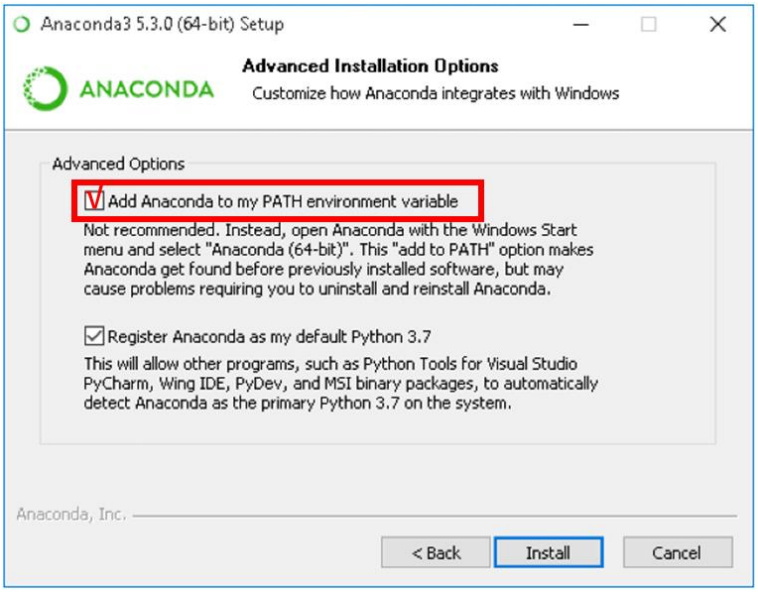
User Manual of CryptoChem for Windows 10

I. Installation of Anaconda

Download and install Anaconda following the instructions in the link below (python >= 3.6):

https://docs.anaconda.com/anaconda/install/windows/

Note: During the installation, please CHOOSE "Add Anaconda to your PATH environment variable".

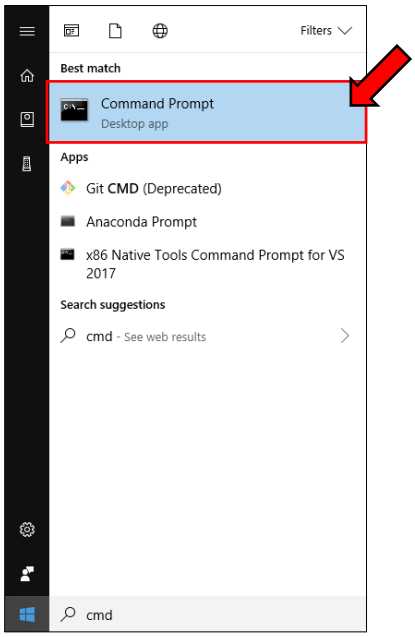


II. Creating the virtual environment for CryptoChem

A virtual environment with all the necessary packages, libraries and configurations has been created for convenience (*CryptoChem.yml*). This virtual conda environment can be used for both MOLWRITE_GUI and MOLREAD_GUI software.

You only need to extract it with the following instructions.

1. Open Command Prompt from Windows.



2. Change the path to CryptoChem folder which contains the "*CryptoChem.yml*" file. This can be done in command prompt with

```
cd <path_to_CryptoChem_folder>
```

```
conda env create -f CryptoChem.yml
```

Before Using CryptoChem

In the previous step, you have successfully created the virtual conda environment called “CryptoChem”. In this environment, you will be able to use both MOLREAD_GUI and MOLWRITE_GUI software.

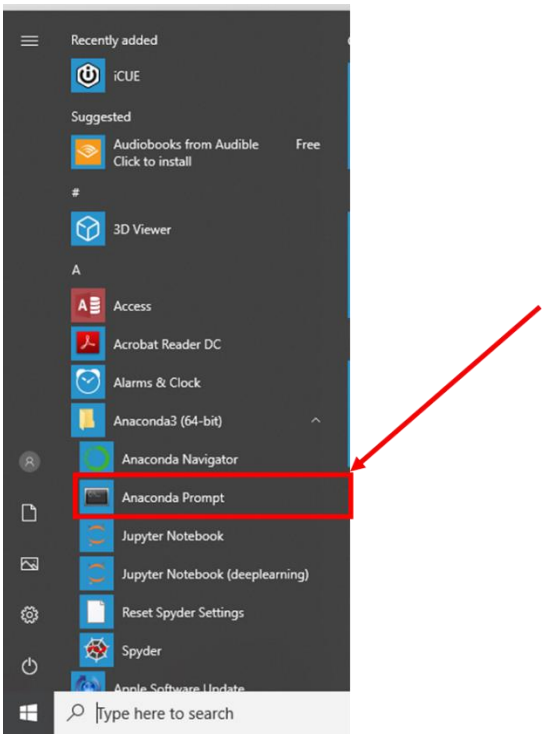
There are some important things to keep in mind before running MOLWRITE_GUI or MOLREAD_GUI.

1. **Always activate your conda environment.** This will allow you to run the software without running into issues related with version inconsistency, missing package, dependencies, etc.
2. **Always set the working directory to MOLWRITE_GUI or MOLREAD_GUI folders in the command line** to either encrypt or decrypt your CryptoChem messages respectively.
3. **In case there is any missing package, use the following command to install packages:**

```
conda install package_name
```

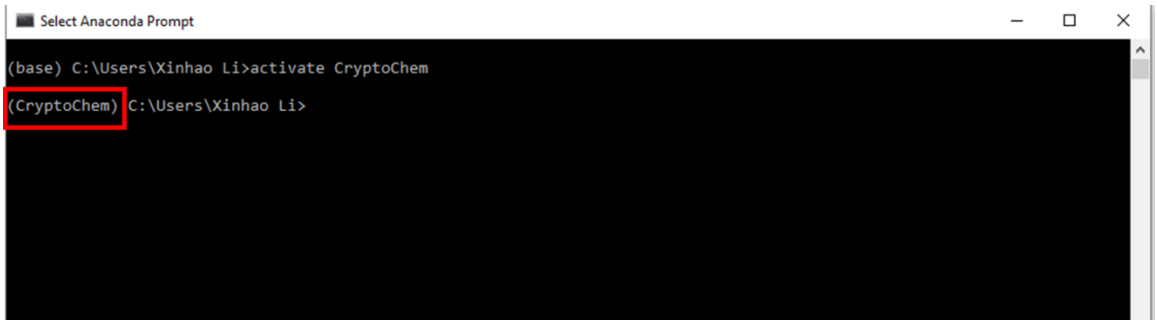
Using MOLREAD_GUI

1. Open Anaconda Prompt

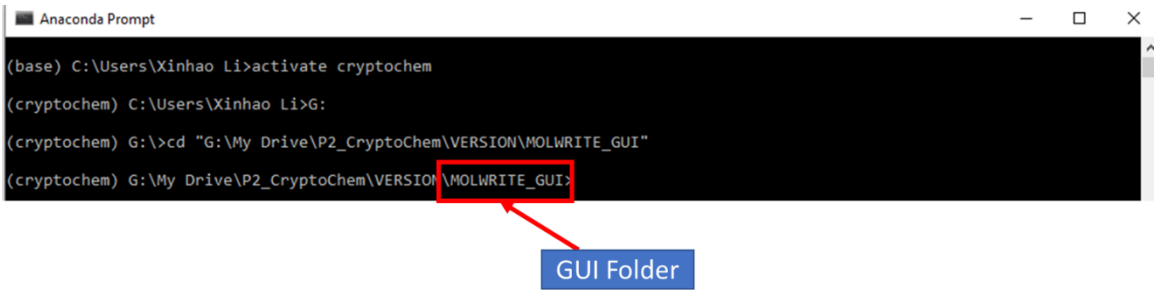


2. Activate CryptoChem (conda environment)

```
activate CryptoChem
```



3. Change directory to MOLWRITE_GUI folder

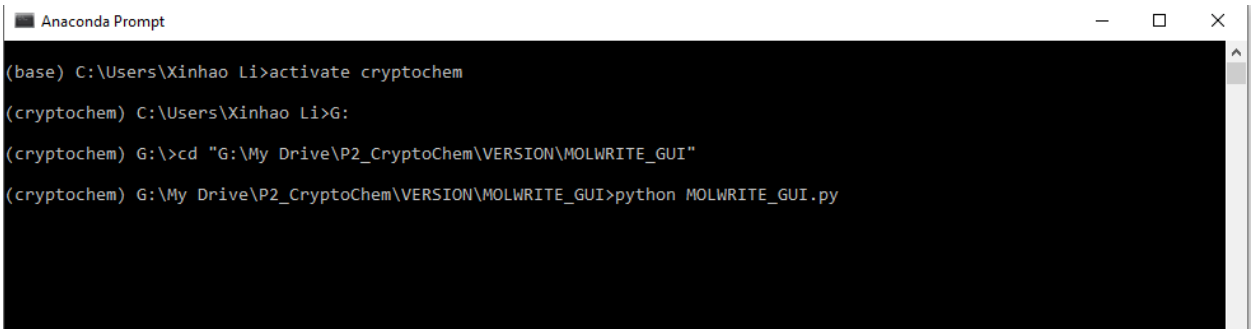


Need help to change directory in Windows command line?

Check this: https://www.youtube.com/watch?v=BfXh11ryBJg

4. Run GUI

```
python MOLWRITE_GUI.py
```

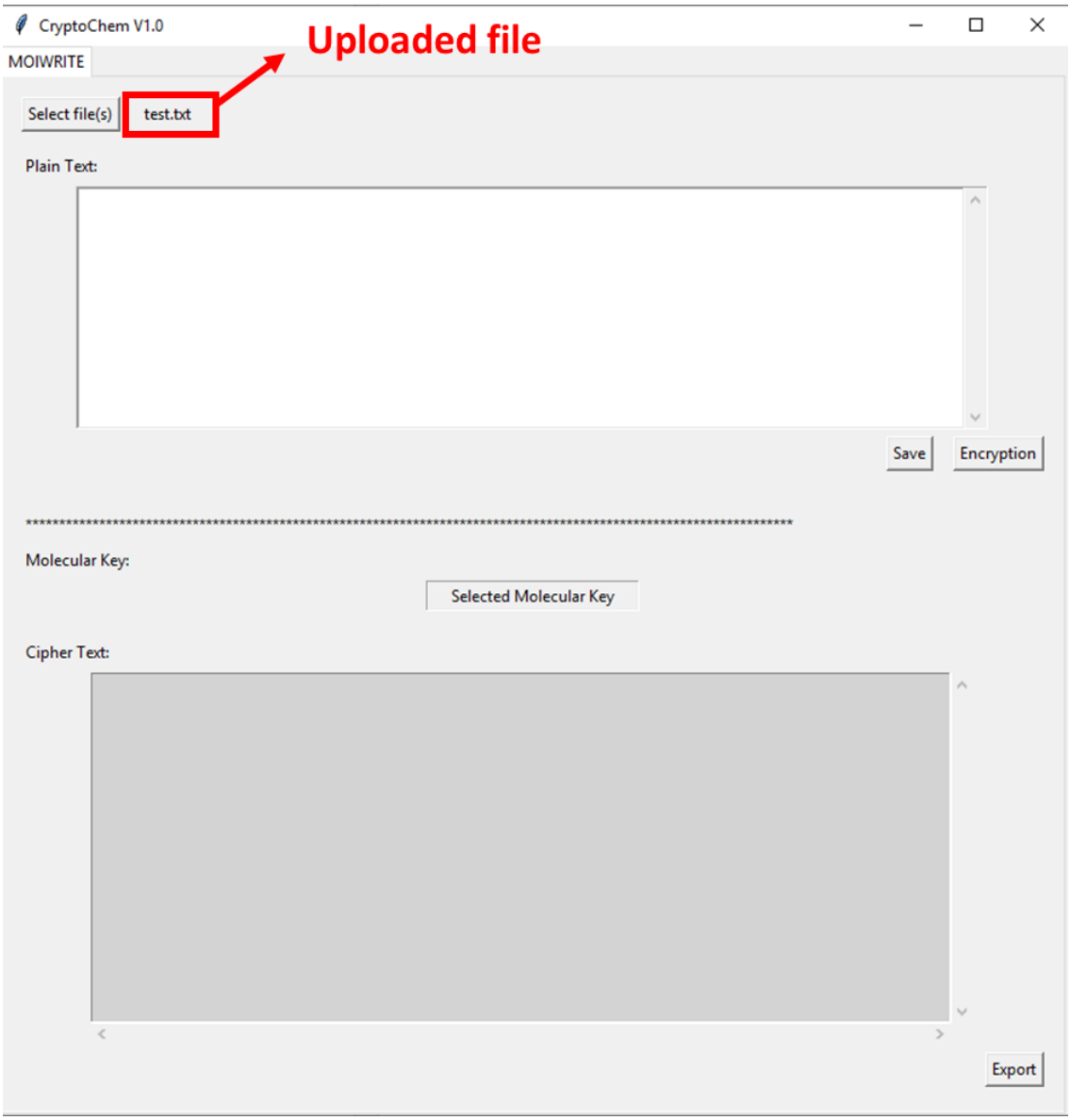


5. Upload a .txt file via ‘Select file’ button. For now, it only supports one file at a time. (recommended)

Or

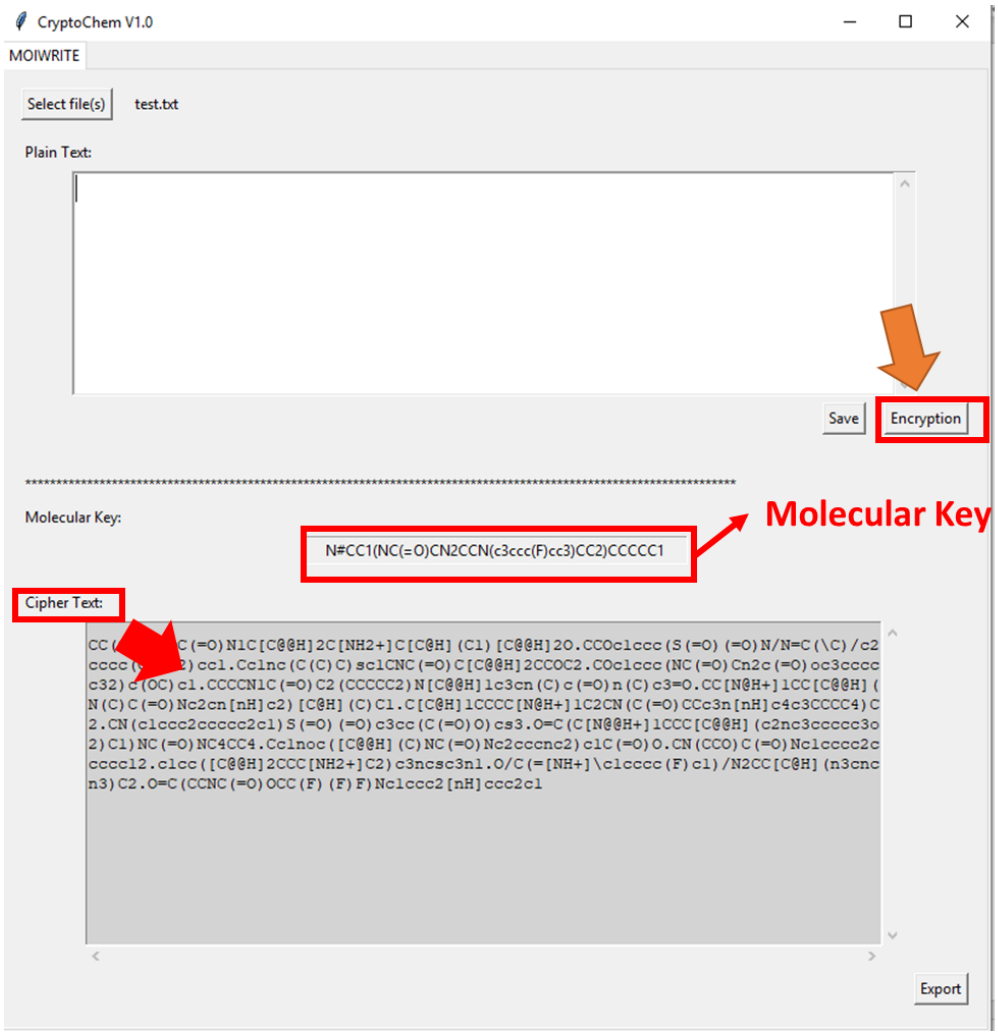
Write in the ‘Plain Text’ prompt. The written text can be saved via the ‘Save’ button.

Note: Can’t use both together, it will generate an error.

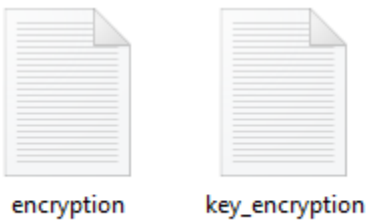


6. Encryption: Click ‘Encryption’ button.

   A molecular key and a chemical message (cipher text) will be generated.



7. Click the ‘Export’ button for save the cipher text. Choose the location and files name of cipher text. At the same time, a file (contains molecular key) named ‘key_filename” will as be saved.



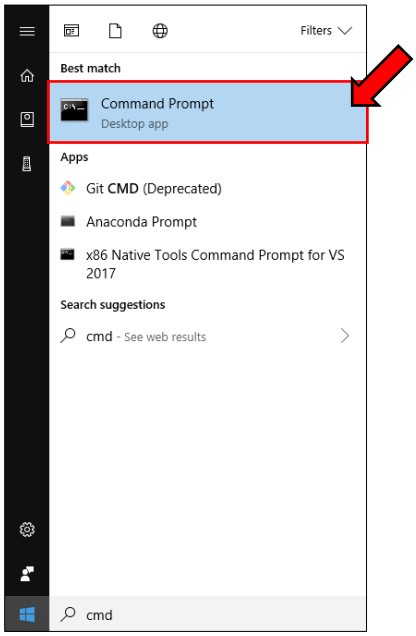
Using MOLREAD_GUI

There are two input files required for MOLREAD_GUI: *ciphered*.txt and key_*ciphered*.txt.

ciphered.txt contains the cryptochem message with virtual chemicals encoding the actual message.

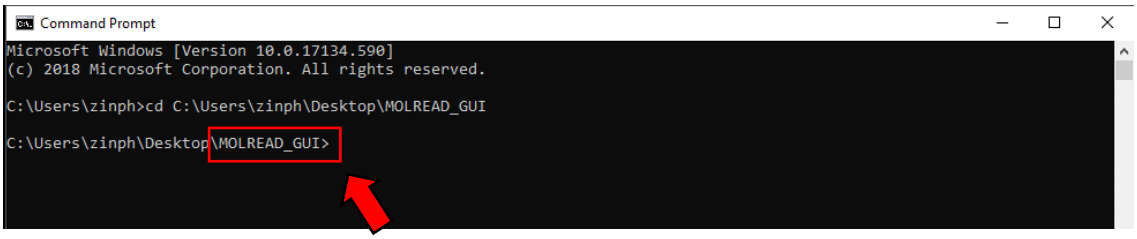
key_*ciphered*.txt contains the molecular key (only one chemical) essential in decoding the *ciphered*.txt.

1. Open Command Prompt from Windows.



2. Change directory to MOLREAD_GUI folder.

```
cd <path_directory_to_MOLREAD_GUI>
```

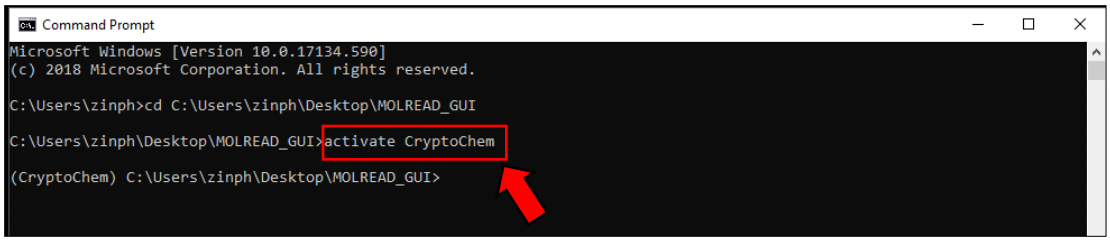


If you need help to change directory in Windows command line, check this:

https://www.youtube.com/watch?v=BfXh11ryBJg

3. Activate the conda environment for CryptoChem.

```
activate CryptoChem
```



4. Type the following to run MOLREAD software. It will then prompt a GUI for user's convenience.

```
python MOLREAD_GUI.py
```

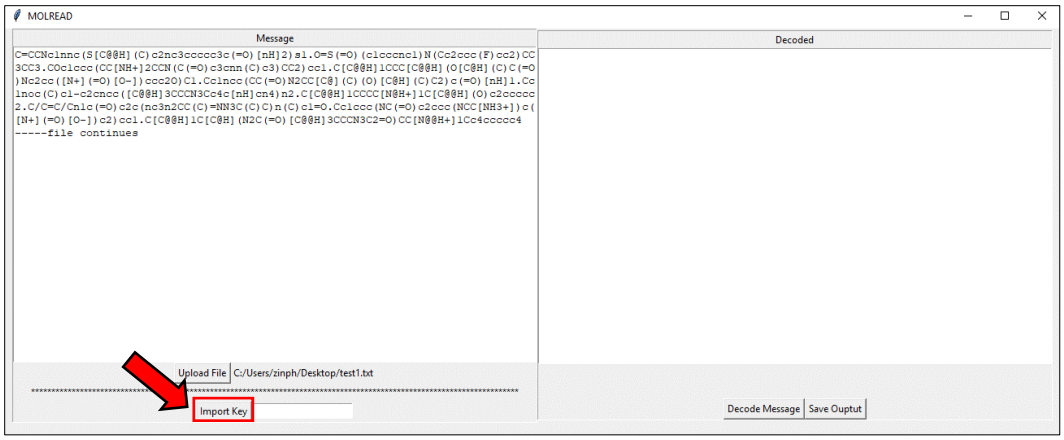
5. Click "Upload File" button and upload the encrypted CryptoChem message: *ciphered*.txt (recommended)

or

you can also copy paste the CryptoChem message in the "Message" box

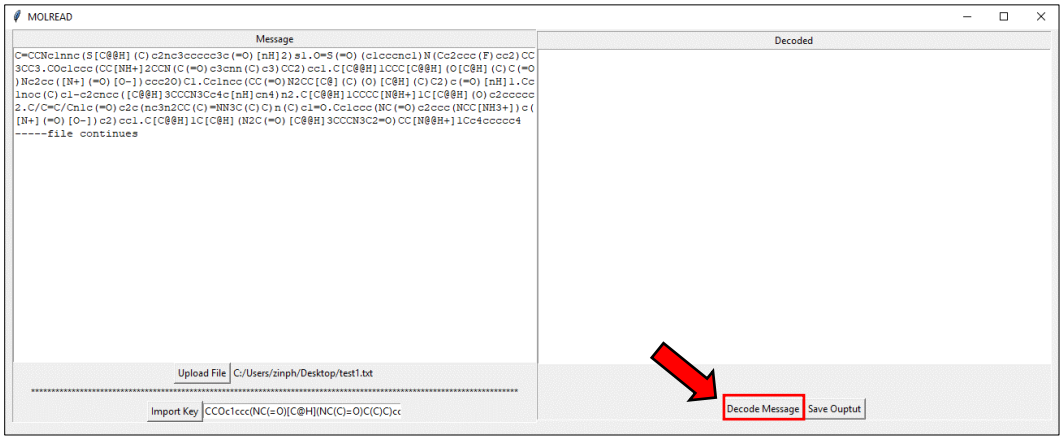
Please choose only one of those options. If not, it will generate an error.

6. Click "Import Key" to upload the molecular key previously generated with MOLWRITE: key_*ciphered*.txt



7. Click “Decode Message” to decipher the CryptoChem message.

   (It will take a while depending on the amount of content it needs to decode. It will also show the time elapsed for deciphering the message.)



8. Click “Save Output” to choose a folder and provide a desired file name for the decrypted message. This step can be skipped if the user does not want to save the output file.