**Read Me for understanding the automated handling FnO Bhav Copy to convert to ticker specific time series, for convenient use by anu Algos**

-constructed by Arunabha Sarkar

There are several code files under the hood. These multiple code files are executed in a fixed order (automatically of course). These run automatically post market hours using Windows Scheduler to update themselves on one PC. The changes are then added/updated into the Central Database. Thus, a backup also exists. And, if there is any tampering/accidental loss/sabotage with the Central Database, it is automatically corrected every day, post market hours.

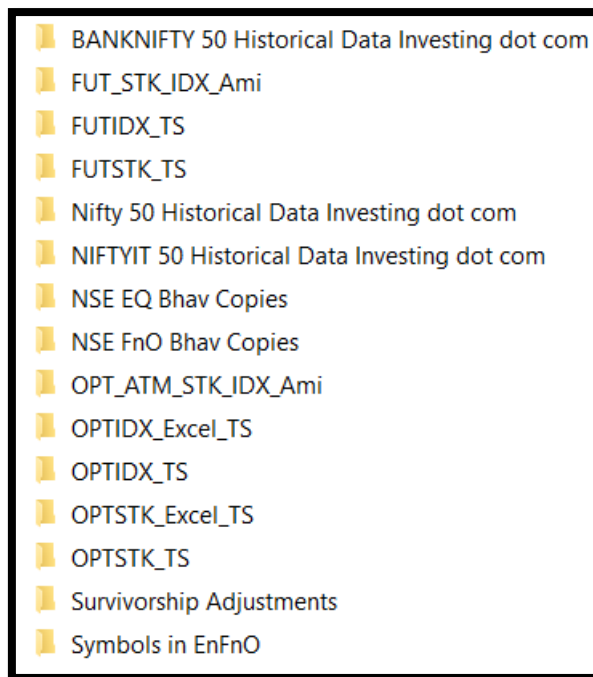The brief explanation of the sub program files is given as follows:

1. Two folders need to be made in a single folder to start with, as depicted below:
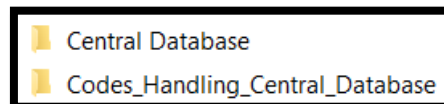

2. Current version code files in the directory 'Codes_Handling_Central_Database':
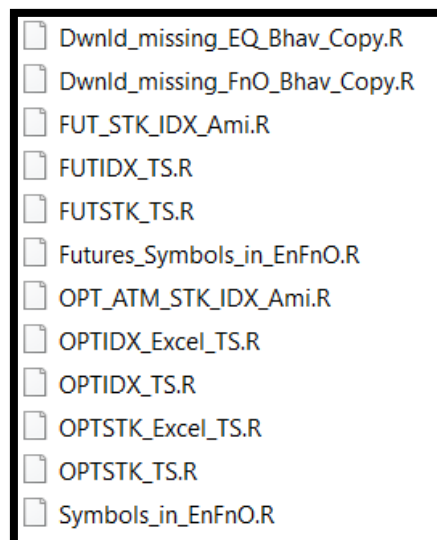
3. Typical Content in the 'Central Database' (barring one folder, rest all others get automatically created):

4. In the folders '**BANKNIFTY 50 Historical Data Investing dot com**', '**Nifty 50 Historical Data Investing dot com**' & '**NIFTYIT 50 Historical Data Investing dot com**', the latest NIFTY50 date & OHLCV values are updated after EOD. This update is automated; it looks for data from NSE website, if not available then Yahoo Finance, if not, then investing dot com (for the last website, advance Selenium is used which can auto-navigate intermittent internet speed whenever required, automation is fully coded). If none of the three find them, then it is assumed to be a market holiday. The rest of the programs utilize the same to understand if markets were open, only when open they need to run (all of this is coded obviously).

5. The files '**Dwnld_missing_EQ_Bhav_Copy**.R' & '**Dwnld_missing_FnO_Bhav_Copy**.R' download equity and derivates data into the data base folders 'NSE EQ Bhav Copies' & 'NSE FnO Bhav Copies' respectively. Folder is made automatically if they do not exist already. If folder is present, only missing contents are downloaded. 181 seconds stop time provided between downloads (to prevent getting blocked by NSE servers, as evident by IT error: 'Error 403'). Unzipping and saving is done automatically (in the RAM, not on Hard Drive). The native filename provided by NSE is maintained. Here is a glimpse of the content (for cross-checking if needed):
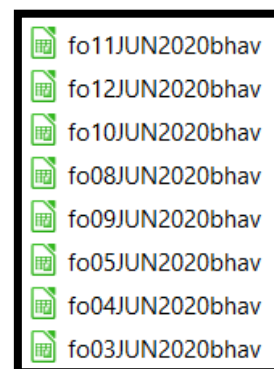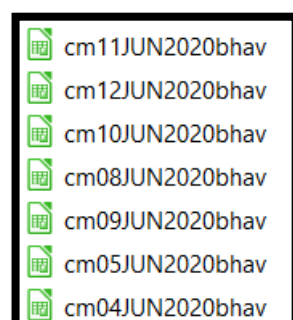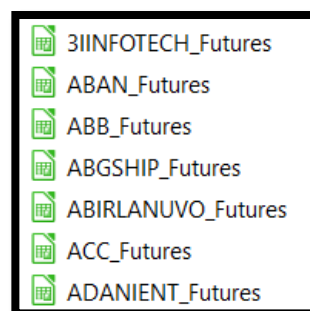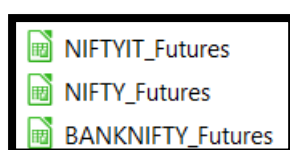
6. Files '**Futures_Symbols_in_EnFnO**.R' & '**Symbols_in_EnFnO**.R' are for checking if any new symbol (Futures and Equity respectively) is added into the new bhav copy files. These need not be run daily but should be done every Thursday atleast (end of expiry, NSE TICKER that are discontinued in the FnO segment fall into this category). Its record is stored in the folders '**Symbols in EnFnO**'. Folder is made automatically if it does not exist already. If folder is present, latest content is checked. If present, testing is done from the last entry. If absent, all files get scanned to generate new report. These records thus get auto updated when ever it is needed. Daily version control regulated by using Date in YYYYDDMM in the filename itself. As these updates intelligently on previous data, its run once every day and that run is super-fast on ordinary computers. Here is a glimpse of the content (for cross-checking if needed):
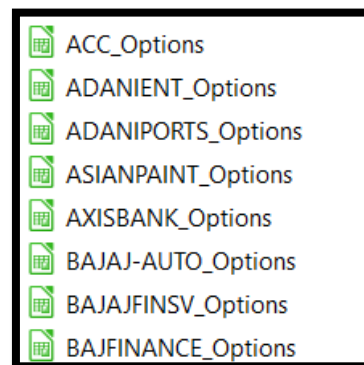
| 20200526_All_EQ_Symbols |
| 20200526_All_FnO_Symbols |
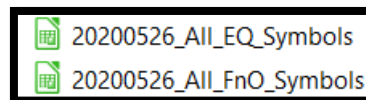
	Standard
1	Unique_EQ_Symbols
2	3IINFOTECH
3	3MINDIA
4	AARTIDRUGS
5	AARTIIND
6	AARVEEDEN
7	ABAN
8	ABB
9	ABGSHIP

	Standard
1	Unique_FnO_Symbols
2	BANKNIFTY
3	NIFTY
4	NIFTYIT
5	ACC
6	ADANIENT
7	ADANIPORTS
8	ADANIPOWER
9	AMARAJABAT

7. Files '**FUTIDX_TS**.R' & '**FUTSTK_TS**.R' generate stock and index ticker wise time series data from the bhav copies. If folder is present, latest content is checked. If present, testing is done from the last entry. If absent, the raw bhav copy files get scanned to generate new output from scratch (the bhav copy files are intelligently sample first to approximately guess correct entry and exit date points of the Tickers in the FnO category, only then they are read. This ensures a lot of time optimization when this is run for the very first time). These codes update the existing files when present. If there is no existing file, then the bhav copies are checked to make the same. Thus, by chance if some file is deleted accidentally, no problem, it will be recreated properly from the start. The first run of the codes can take some time (days), the subsequent runs only go through the latest bhav copies, thus super-fast (seconds/minutes). As these updates intelligently on previous data, its run once every day and that run is super-fast on ordinary computers. Here is a glimpse of the content (for cross-checking if needed):

| 3IINFOTECH_Futures |
| ABAN_Futures |
| ABB_Futures |
| ABGSHIP_Futures |
| ABIRLANUVO_Futures |
| ACC_Futures |
| ADANIENT_Futures |

| NIFTYIT_Futures |
| NIFTY_Futures |
| BANKNIFTY_Futures |

8. File '**FUT_STK_IDX_Ami**.R' works on files created in point number #7 to generate Amibroker compatible OHLCV data for all Stocks and Indices data of latest expiry in the folders '**FUT_STK_IDX_Ami**' in the Central_Database folder. As these updates intelligently on previous data, its run once every day and that run is super-fast on ordinary computers.

9. File '**OPTIDX_TS**.R' and '**OPTSTK_TS**.R' runs on the file generated in point #7 to tidy the Option chain data to segregate PE/CE/Expiries into single csv files. They respectively run on the Indexes (NIFTY50, Banknifty & NIFTIY) and stocks (all the FnO stocks throughout the years). The output csv files are made/updated into the respective folders '**OPTIDX_TS**' & '**OPTSTK_TS**'. The output csv files have all the content for testing advance option strategies like Butterfly and Condor. The format of this is however not suitable for Excel/VBA based testing. This is solved in the next point. This format is however ideal for R/Python/Amibroker based testing and deployment. As these updates intelligently on previous data, its run once every day and that run is super-fast on ordinary computers. Here is a glimpse of the content (for cross-checking if needed)

The content has 906 columns for the stock ticker files, 1500+ columns for indexes.

10. Files '**OPTIDX_Excel_TS**.R' and '**OPTSTK_Excel_TS**.R' generate Excel files for every ticker from Index and individual stocks into the output folders '**OPTIDX_Excel_TS**' and '**OPTSTK_Excel_TS**' respectively. These are ideal for Excel/VBA based back-testing. Just as before, these updates intelligently on previous data, its run once every day and that run is super-fast on ordinary computers. Here is a glimpse of the content (for cross-checking if needed):
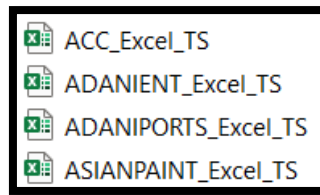
Here is a glimpse of the content. Notice how sheets contains different expiries. Each of those sheets contain different strikes for handling various strikes. All the columns across the sheets have unique (and predictable) names, thus they can be accessed programmatically using INVERSE formula and VBA scripting.

	A	B	C	D	E	F	G	H	I		K	L	M
1	Date_YYYY	INSTRUME	SYMBOL_(	OPEN_SPC	HIGH_SPO	LOW_SPO	CLOSE_SP(	LAST_SPO	TOTTRDV/	STRIKE_CE	OPEN_CE	HIGH_CE_	LOW_CE_/
2	20110103	EQ	ACC	1078	1084.4	1065	1074.4	1065	2.61E+08	1080	21	23	19.95
3	20110104	EQ	ACC	1074.7	1088	1065	1073.35	1065	3.09E+08	1080	19.35	29.95	19.35
4	20110105	EQ	ACC	1074.4	1079.9	1057.35	1064.4	1057.35	1.64E+08	1080	20.3	20.3	20
5	20110106	EQ	ACC	1067	1069.5	1015	1022.55	1015	5E+08	1040	17.5	17.5	14.1
6	20110107	EQ	ACC	1024	1026.9	990.05	1002.3	990.05	3.42E+08	1020	18.85	23.05	14.4
7	20110110	EQ	ACC	1002	1024	983	1016.1	983	3.39E+08	1020	6.8	22.8	6.8
8	20110111	EQ	ACC	1017	1042	1015.65	1029.15	1015.65	2.56E+08	1040	18	22.3	14.1
9	20110112	EQ	ACC	1029.15	1039.7	1015	1028.35	1015	1.47E+08	1040	15.45	20.75	12
10	20110113	EQ	ACC	1028	1052	1026.35	1038.1	1026.35	2.58E+08	1040	23.9	24.8	14.9
11	20110114	EQ	ACC	1037	1043.9	992	1003.9	992	2.81E+08	1020	14.7	31	12
12	20110117	EQ	ACC	1005	1022.95	999.3	1009.15	999.3	1.33E+08	1020	0	0	0
13	20110118	EQ	ACC	1018.75	1033	1008.05	1029.15	1008.05	1.26E+08	1040	8.5	12.8	8
14	20110119	EQ	ACC	1023	1027.1	1003	1013.85	1003	2.29E+08	1020	13.8	13.8	7
15	20110120	EQ	ACC	1006	1028	1004	1016.8	1004	1.05E+08	1020	11.5	12.5	11.5
16	20110121	EQ	ACC	1015	1023.9	992.15	996.35	992.15	1.95E+08	1000	18.55	18.55	7.1

ACC_CE_ATM | ACC_CE_Expiry_1 | ACC_CE_Expiry_2 | ACC_CE_Expiry_3 | ACC_PE_ATM | ACC_PE_Expiry_1 | ACC_PE_

11. File 'OPT_ATM_STK_IDX_Ami.R' generates latest Amibroker compatible ATM data (for deployment) of all NSE Indexes and Stocks into the folder 'OPT_ATM_STK_IDX_Ami'. This is for execution/deployment of very basic Option strategies.