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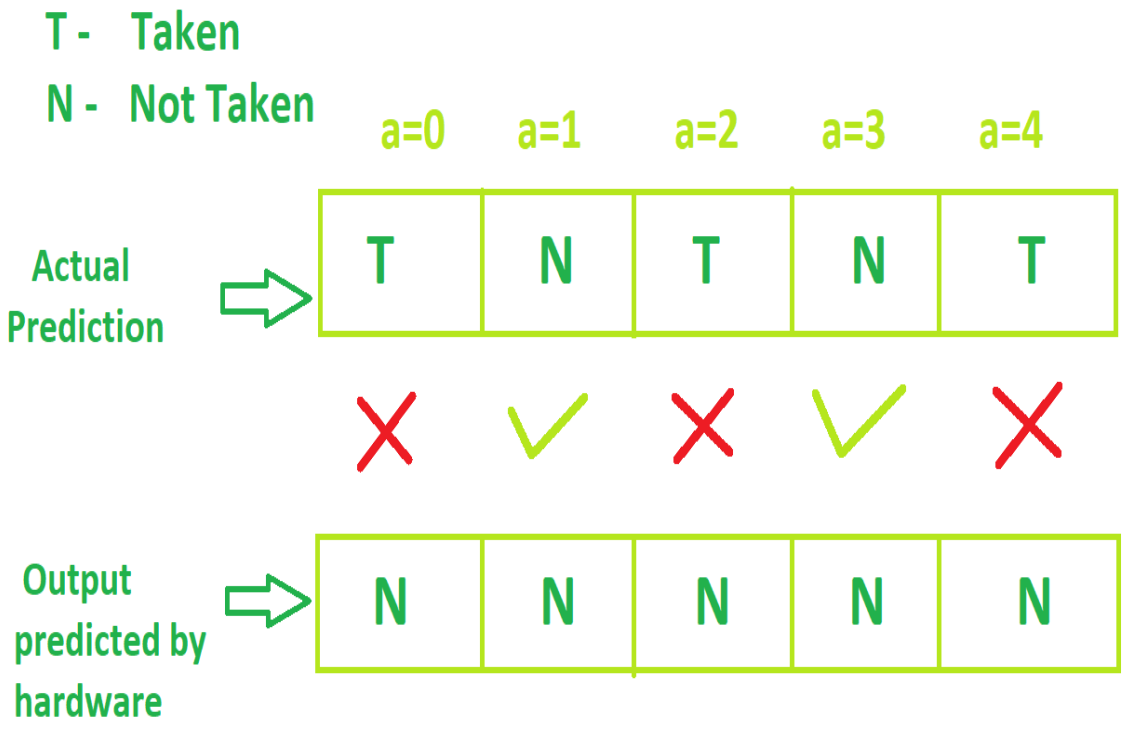
Static prediction:

In case of Static branch prediction technique underlying hardware assumes that either the branch is not taken always or the branch is taken always.

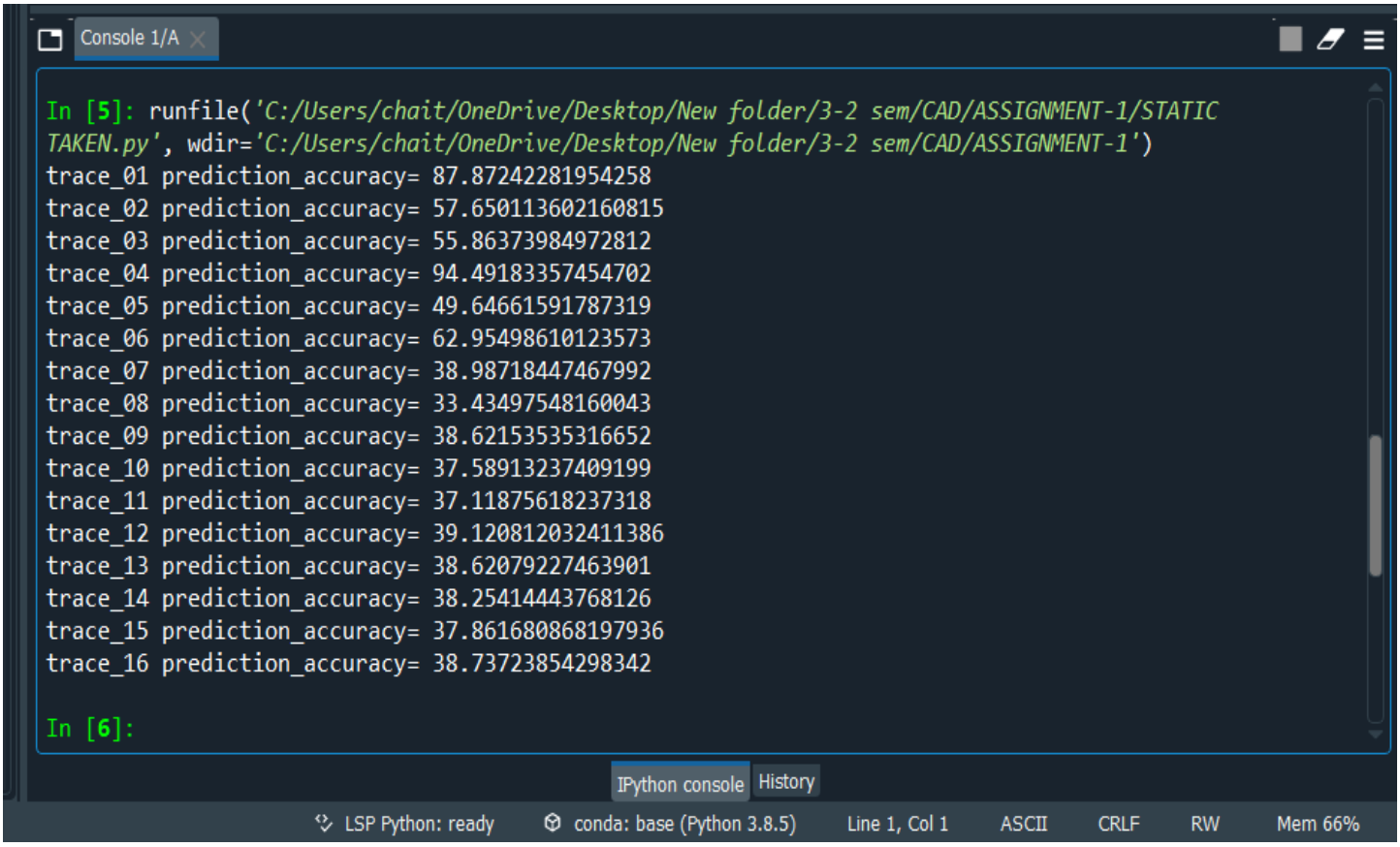
Eg:-

underlying hardware has assumed that branch is not taken always. The output predicted by underlying hardware and actual output is shown in fig:

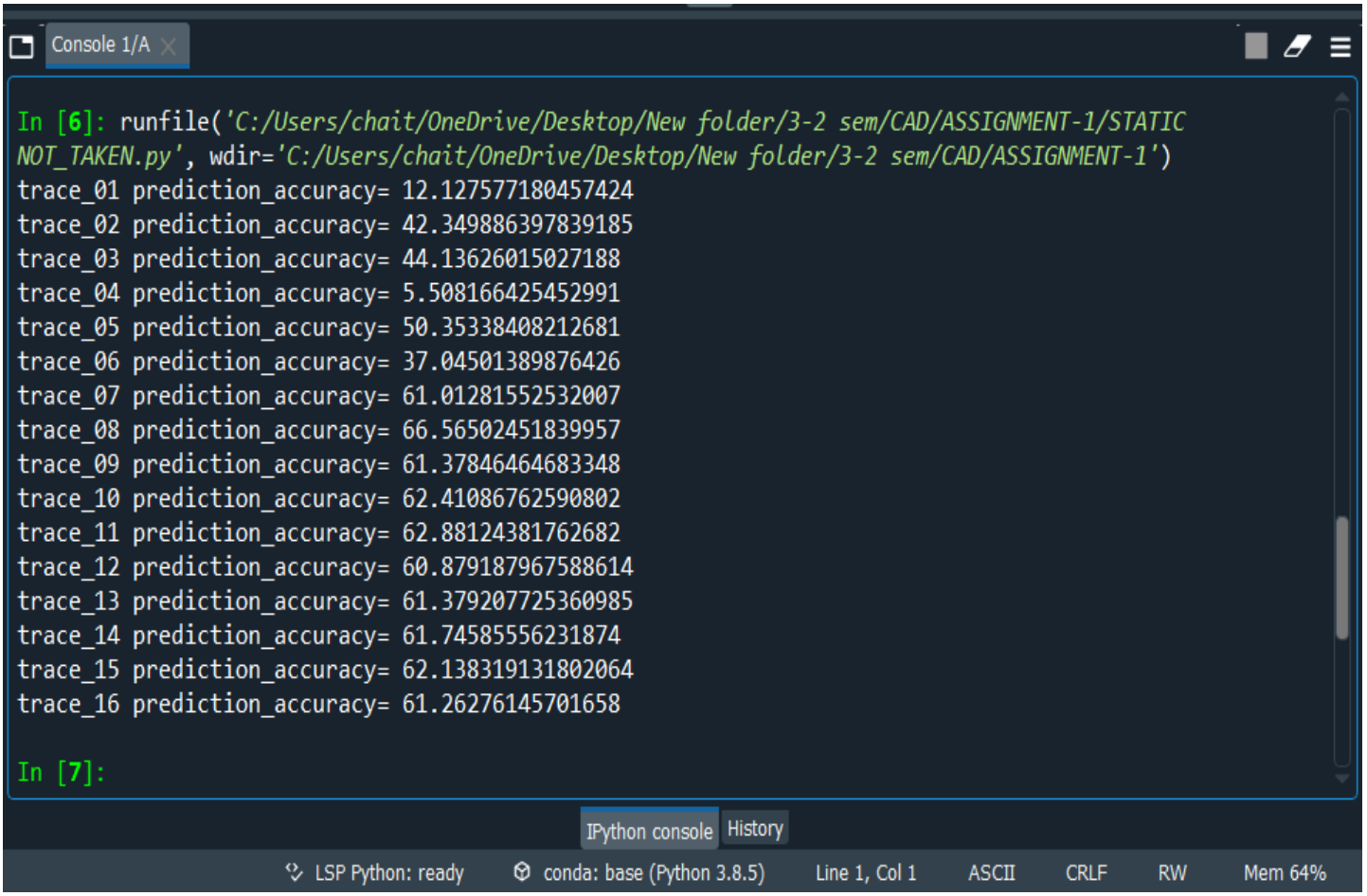


RESULTS:

ALWAYS TAKEN: - (SCREENSHOTS AFTER RUNNING .PY ON SPYDER(ANACONDA) COMPILER)



ALWAYS NOT_TAKEN: -



Dynamic Prediction: -

In Dynamic branch prediction technique prediction by underlying hardware is not fixed, rather it changes dynamically. This technique has high accuracy than static technique.

Some of them I implemented are:

=> Dynamic-BM

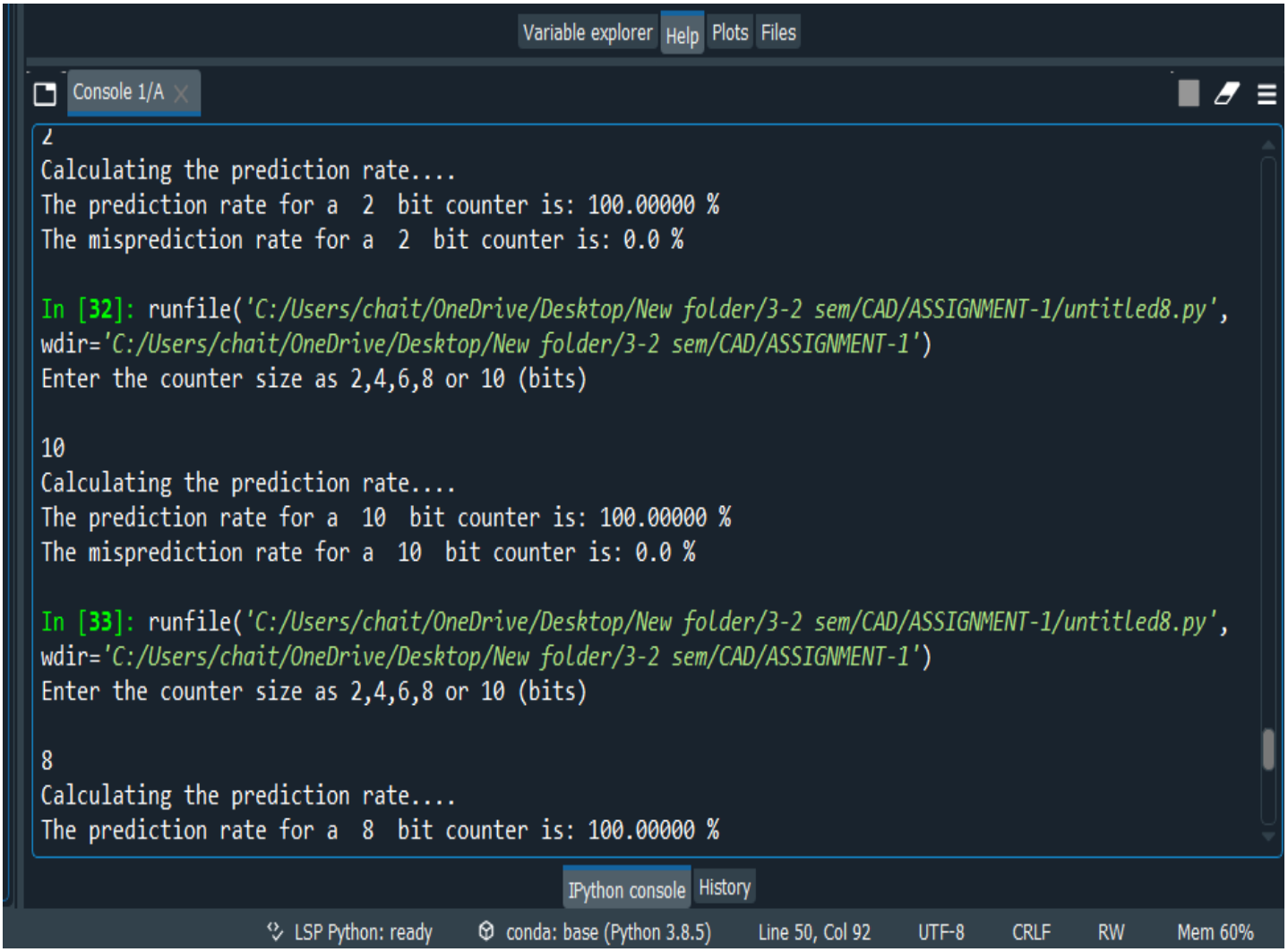
=> Dynamic-GSHARE

=>Local Predictor

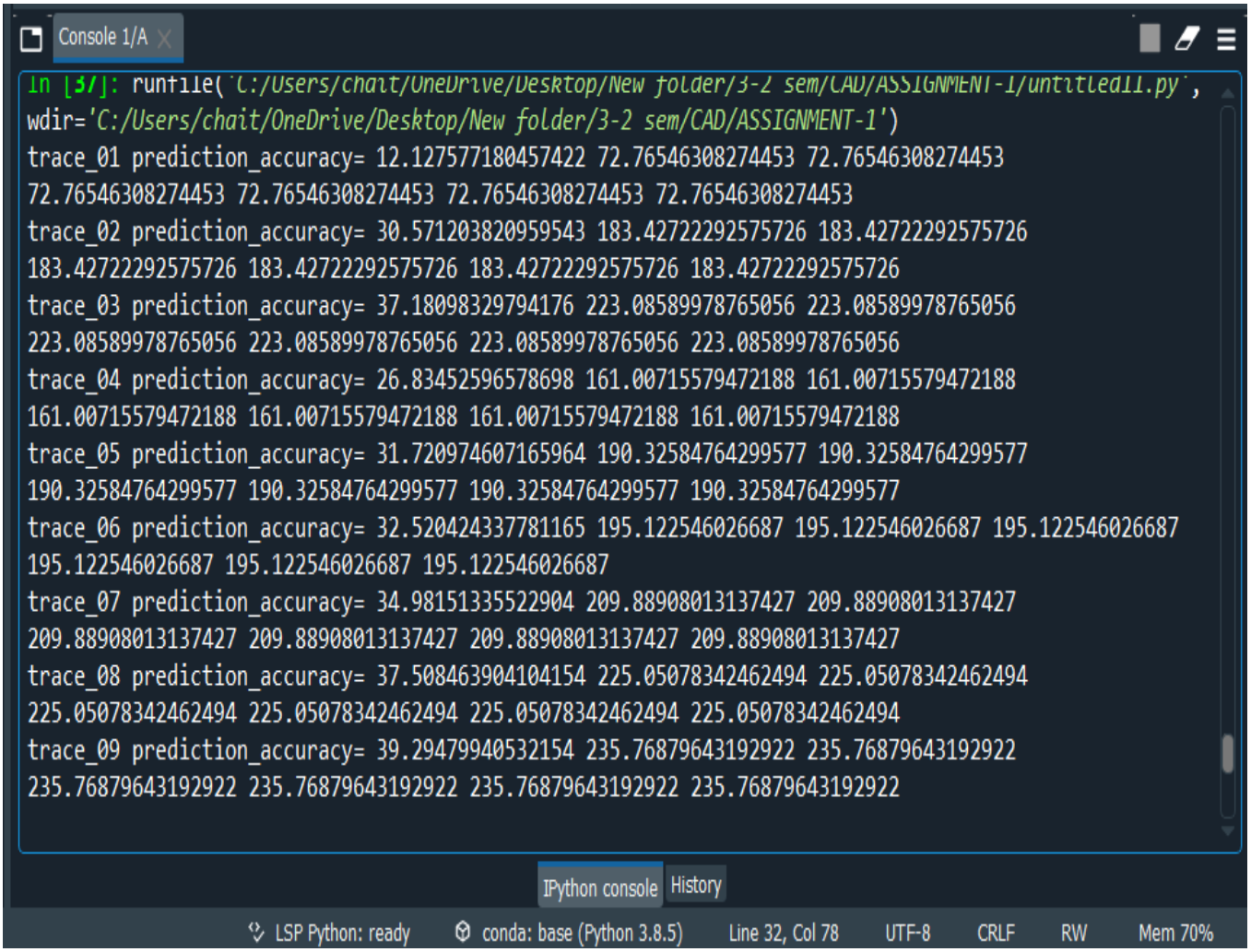
LOCAL PREDICTOR: -

A two-level adaptive predictor remembers the history of the last n occurrences of the branch and uses one saturating counter for each of the possible 2^n history patterns. ... This means that the last two occurrences of the branch are stored in a two-bit shift register.

(SCREENSHOT OF .PY PROGRAM READING trace_01 file SHOWING FOR COUNTER SIZES 2,8,10)



DYNAMIC BI MODEL: (RUN UPTO 9 TRACE FILES)


Console 1/A
In [37]: runfile('C:/Users/chait/OneDrive/Desktop/New folder/3-2 sem/CAD/ASSIGNMENT-1/untitled1.py',
wdir='C:/Users/chait/OneDrive/Desktop/New folder/3-2 sem/CAD/ASSIGNMENT-1')
trace_01 prediction_accuracy= 12.127577180457422 72.76546308274453 72.76546308274453
72.76546308274453 72.76546308274453 72.76546308274453 72.76546308274453
trace_02 prediction_accuracy= 30.571203820959543 183.42722292575726 183.42722292575726
183.42722292575726 183.42722292575726 183.42722292575726 183.42722292575726
trace_03 prediction_accuracy= 37.18098329794176 223.08589978765056 223.08589978765056
223.08589978765056 223.08589978765056 223.08589978765056 223.08589978765056
trace_04 prediction_accuracy= 26.83452596578698 161.00715579472188 161.00715579472188
161.00715579472188 161.00715579472188 161.00715579472188 161.00715579472188
trace_05 prediction_accuracy= 31.720974607165964 190.32584764299577 190.32584764299577
190.32584764299577 190.32584764299577 190.32584764299577 190.32584764299577
trace_06 prediction_accuracy= 32.520424337781165 195.122546026687 195.122546026687 195.122546026687
195.122546026687 195.122546026687 195.122546026687
trace_07 prediction_accuracy= 34.98151335522904 209.88908013137427 209.88908013137427
209.88908013137427 209.88908013137427 209.88908013137427 209.88908013137427
trace_08 prediction_accuracy= 37.508463904104154 225.05078342462494 225.05078342462494
225.05078342462494 225.05078342462494 225.05078342462494 225.05078342462494
trace_09 prediction_accuracy= 39.29479940532154 235.76879643192922 235.76879643192922
235.76879643192922 235.76879643192922 235.76879643192922 235.76879643192922
IPython console
History
LSP Python: ready
conda: base (Python 3.8.5)
Line 32, Col 78
UTF-8
CRLF
RW
Mem 70%