

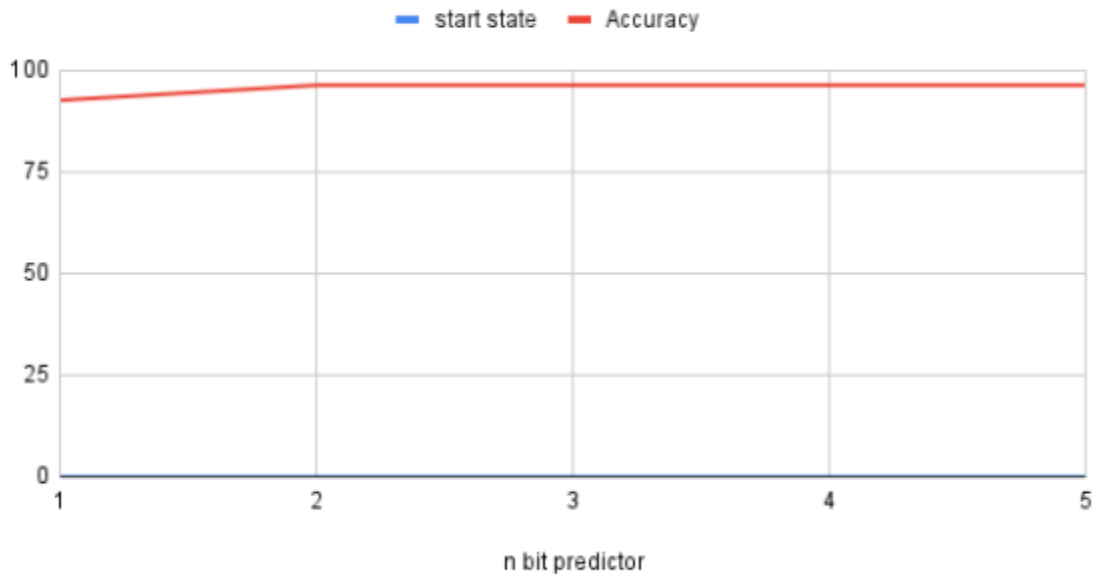
Observation Report of N-bit Branch Predictor

Code Segment-1:

Predictor type	Start state			Accuracy		
1	0	All ones	random	92.5919	92.5926	92.5926
2	0	All ones	random	96.5919	96.2959	96.2952
3	0	All ones	random	96.293	96.2959	96.2959
4	0	All ones	random	96.29	96.2959	96.2959
5	0	All ones	random	96.284	96.2959	96.2959

Graph Plot for Code Segment-1:

start state and Accuracy

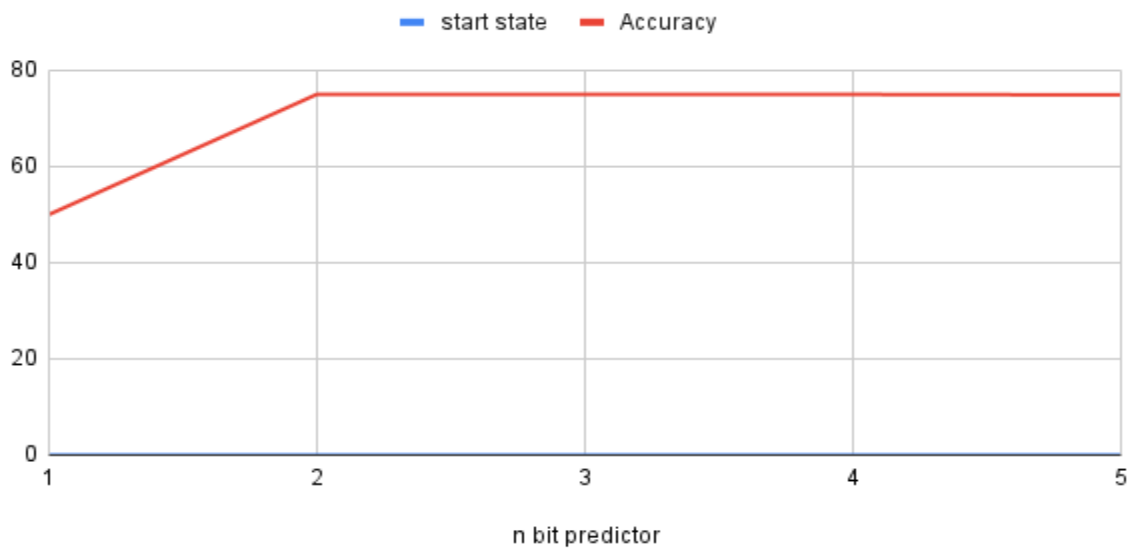


Code Segment-2:

Type of predictor	Start state			Accuracy		
1	0	All ones	random	49.99	50.0025	49.9888
2	0	All ones	random	74.9863	74.9963	49.9925
3	0	All ones	random	74.9963	74.9963	74.7813
4	0	All ones	random	74.9563	74.9963	74.9963
5	0	All ones	random	74.9163	74.867	74.9269

Graph Plot for Code Segment-2:

start state and Accuracy

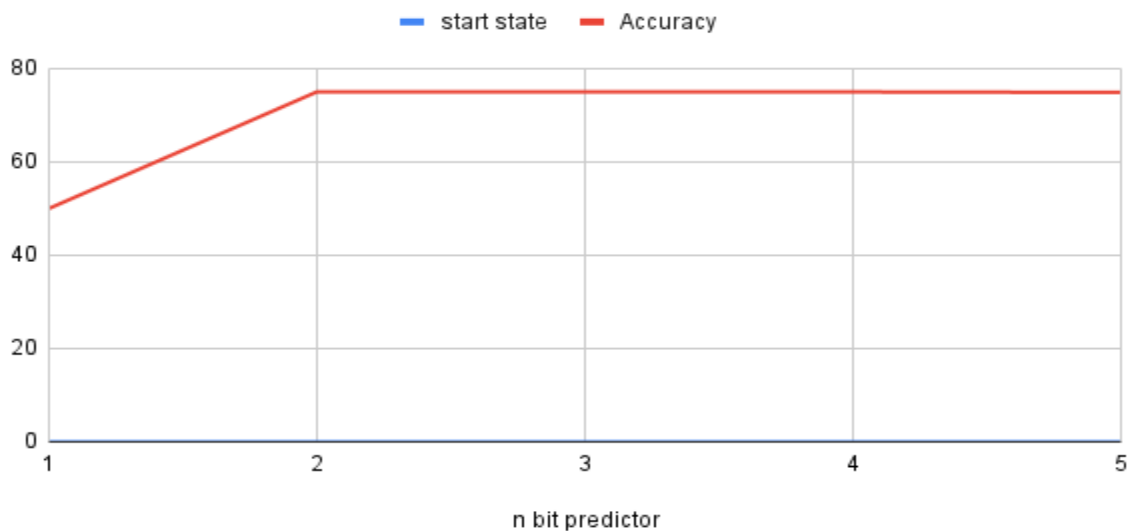


Code Segment - 3:

Type of predictor	Start state			Accuracy		
1	0	All ones	random	49.99	50.0037	50.0037
2	0	All ones	random	74.9494	74.9644	49.9988
3	0	All ones	random	74.9494	74.9569	74.9719
4	0	All ones	random	74.9414	74.9269	74.9719
5	0	All ones	random	74.8595	74.867	74.9269

Graph Plot for Code Segment-3

start state and Accuracy



Observations and Conclusions:

1. It is observed there is an increase in accuracy upto a particular peak point after which a saturation is reached and from there is a slight decrease in the accuracy.
2. Also observed that the no of mismatches decreases with increase in the type of predictor (1 bit < 2 bit <....).It is basically because of the no of increase in states in the branch predictor.
3. Branch prediction state is changed from not taken state to taken state and vice versa is done only when the no of state transitions is more than $((2^n)/2 = 2^{(n-1)})$ states

4. Here we can observe that the accuracy of predictor is independent of starting state and it could be observed that the accuracy of predictor with different starting states coincides.