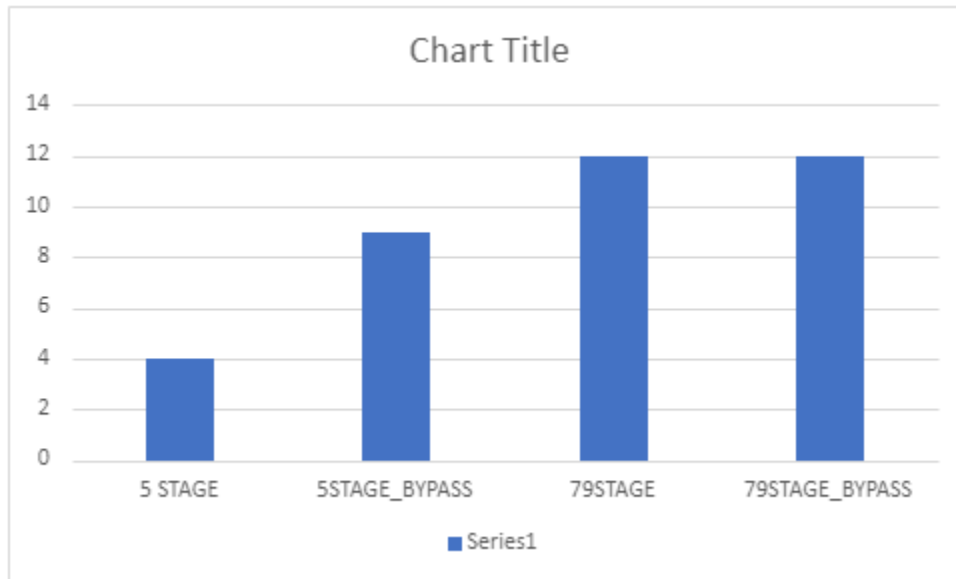


ASSIGNMENT 2

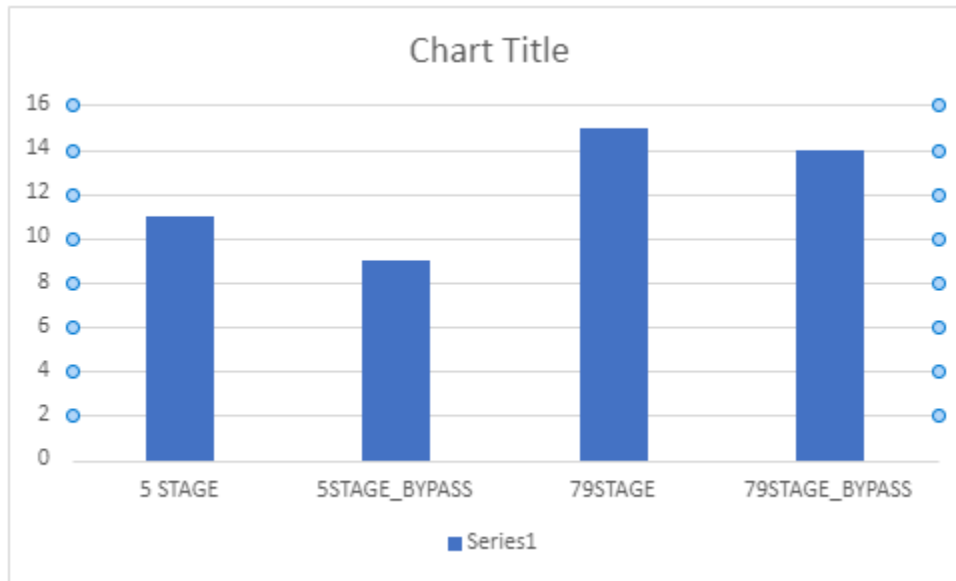
GAURAV KUMAR 2019CS50430
KALLURI VARSHITHA 2019CS51065

PART D

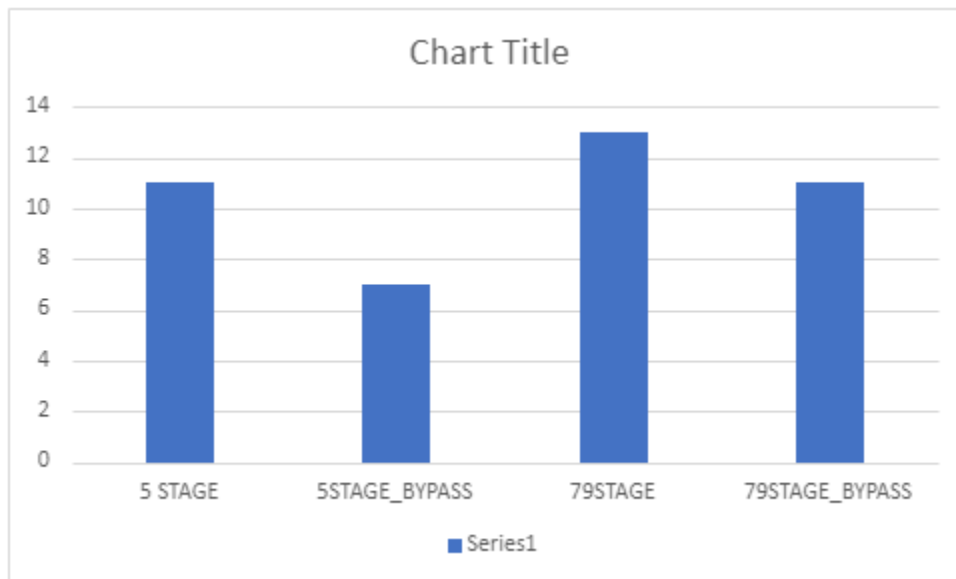
lw \$10, 20(\$1);
sub \$11, \$2, \$3;
add \$12, \$3, \$4;
lw \$13, 24(\$1);
add \$14, \$5, \$6



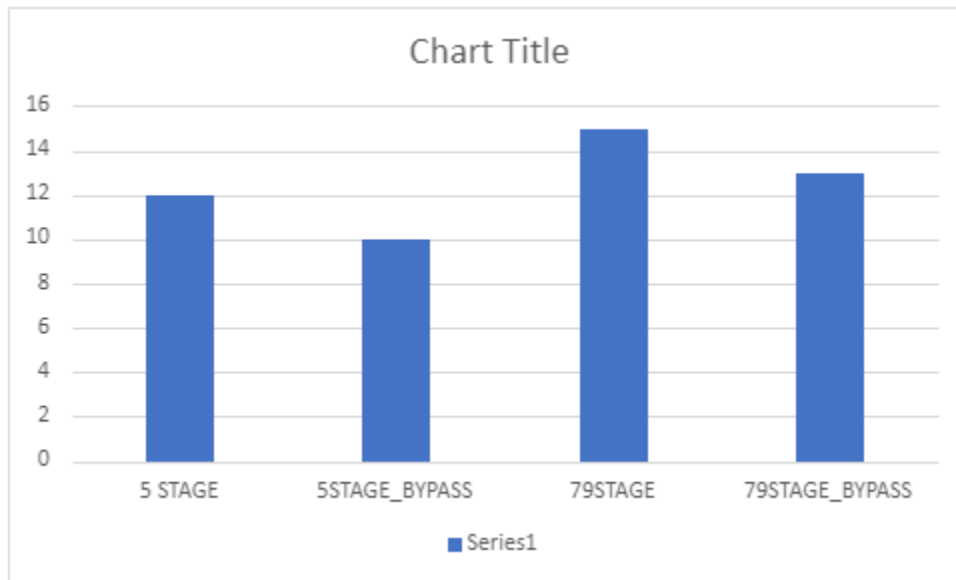
```
sub $2, $1, $3;  
and $12, $2, $5;  
or $13, $6, $2;  
add $14, $2, $2;  
sw $15, 100($2)
```



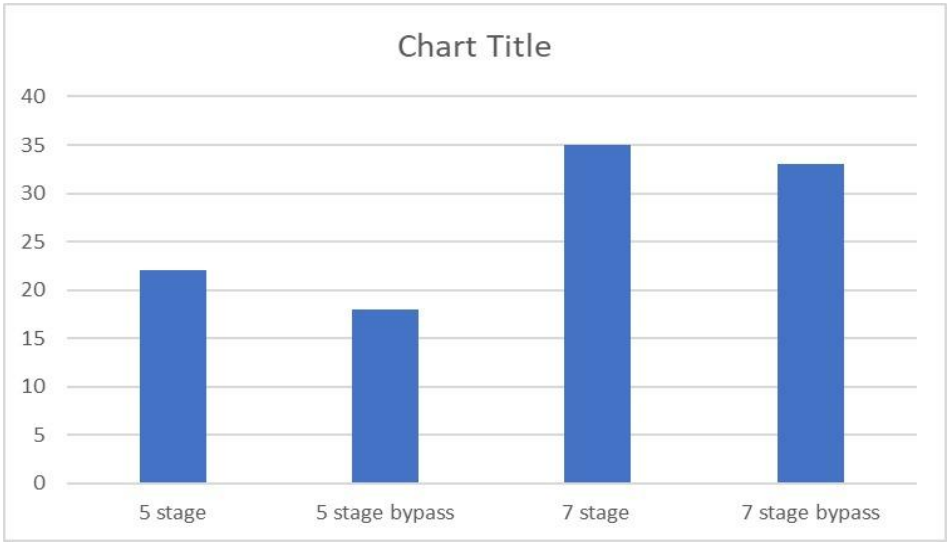
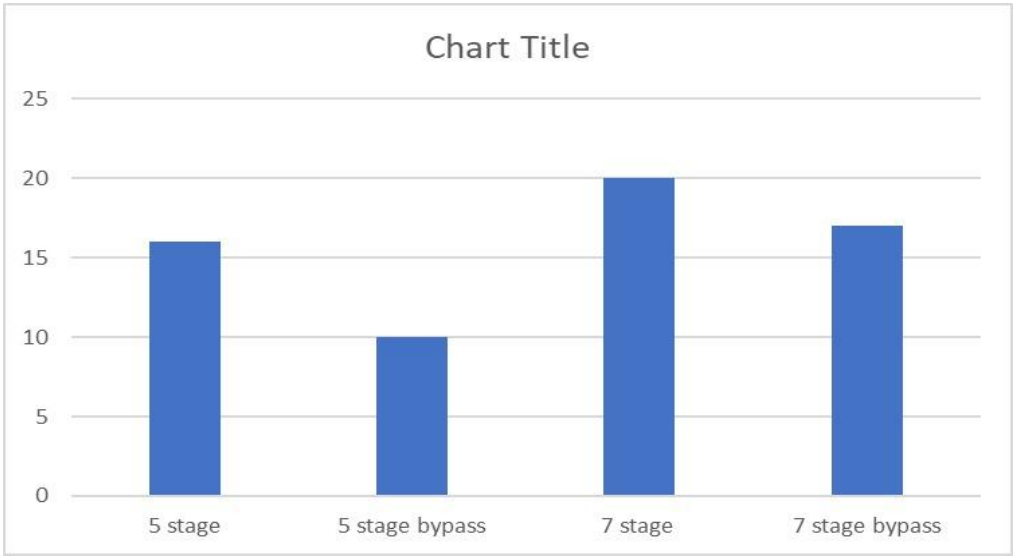
```
add $1, $1, $2;  
add $1, $1, $3;  
add $1, $1, $4
```

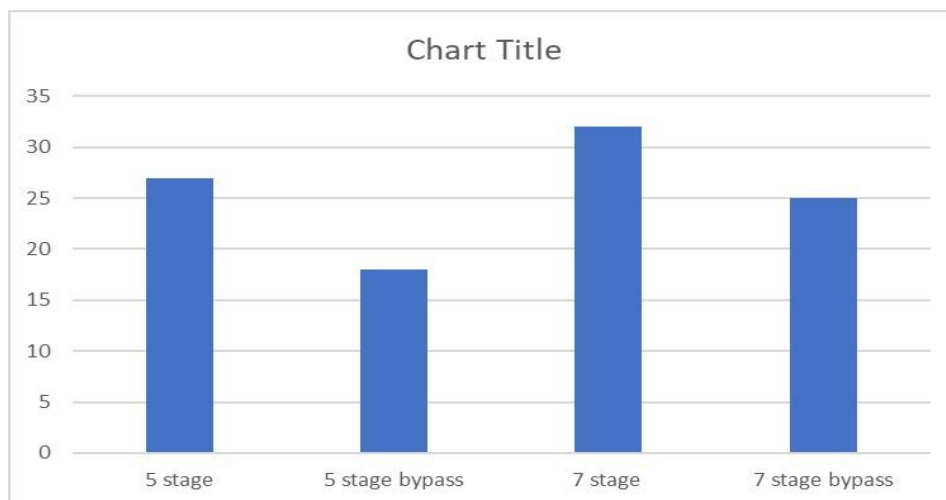
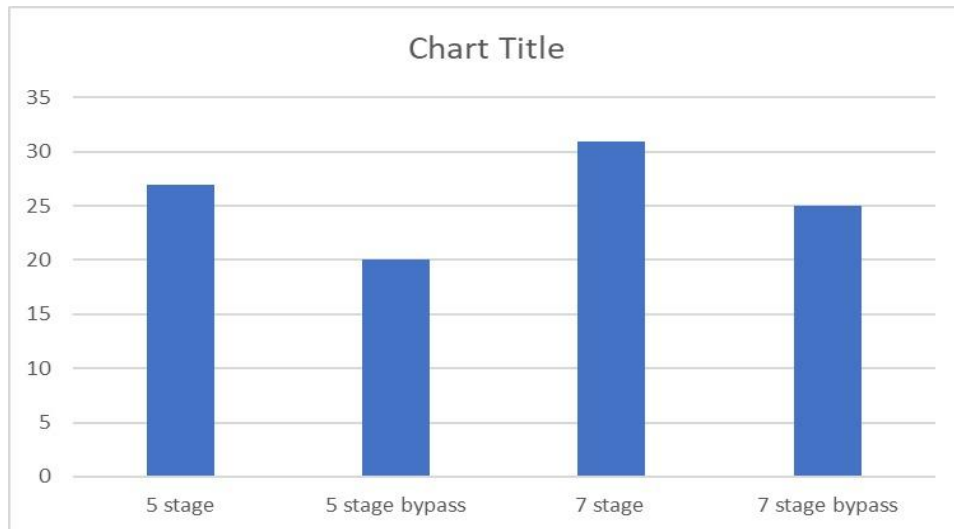


```
lw $2, 20($1);  
and $4, $2, $5;  
or $8, $2, $6;  
add $9, $4, $2;  
slt $1, $6, $7
```



TEST CASES





5stage and 79 stage are taking more cycles without bypassing. When we implemented bypassing within the stages instructions took less cycles to complete

PART E

ONLY SATURATING COUNTER

Initialized a vector of size 2 power 14 with following saturating counters. First predicted using last 14 bits of the given branch address. If predicted outcome is equal to given outcome then it is correctoutput. After predicting, using last 14 bits and given outcome we trained the predictor.

SATURATING COUNTER	ACCURACY	TOTAL PREDICTIONS
00 - strongly not taken	420	548
01 - weakly not taken	475	548
10 - weakly taken	548	548
11 - strongly taken	548	548

ONLY BHR

Initialized a vector of size 2 power 2 with following branch history registers. First predicted using history of two previous branches . If predicted outcome is equal to given outcome then it is correctoutput. After predicting, using history of two previous branches and given outcome we trained the predictor.

BRANCH HISTORY REGISTER	ACCURACY	TOTAL PREDICTIONS
00 - strongly not taken	540	548
01 - weakly not taken	544	548
10 - weakly taken	548	548
11 - strongly taken	548	548

BHR + SATURATING COUNTER

Initialized a vector of size 2^{16} (14 bits address + history of two previous branches) with following. First predicted using 14 bits address + history of two previous branches. If predicted outcome is equal to given outcome then it is correct output. After predicting, using history of two previous branches and 14 bits of given address and given outcome we trained the predictor.

BHR + SATURATING COUNTER	ACCURACY	TOTAL PREDICTIONS
00 - strongly not taken	418	548
01 - weakly not taken	473	548
10 - weakly taken	548	548
11 - strongly taken	548	548

Gaurav - a,bc
Varshitha - d,e