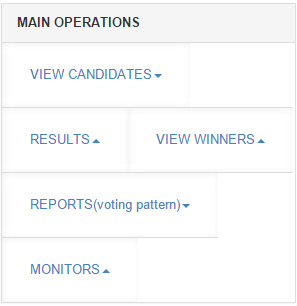
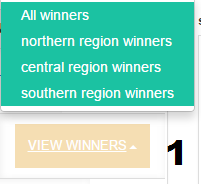
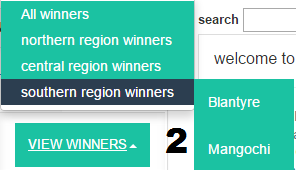
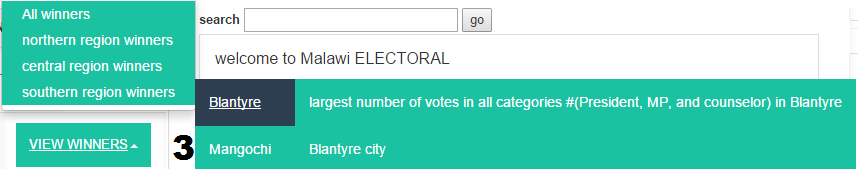
MALAWI ELECTORAL SYSTEM

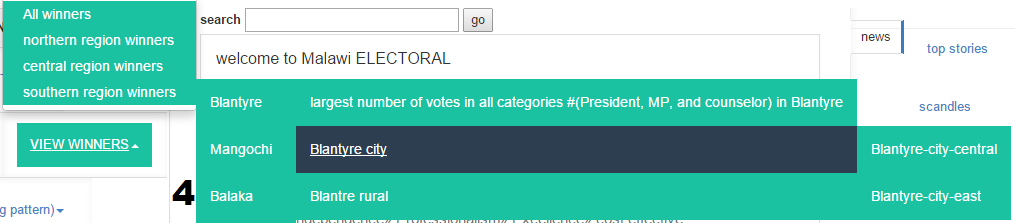
The electoral commission is a standalone system that is responsible for conducting the voting process. here is an online/electronic Malawi Electoral Commission, this system enables citizen to conduct electronic registration, voting and viewing result as per user requirement. Viewing results includes conducting various calculations. There is no duplication of data, it is only entered once and only primary keys are duplicated to create relationship among tables. No numbers are entered as votes but it is calculated based on the citizen/voters who voted particular candidate. all personal details of any particular kind are stored in citizen table and their IDs are used to classify them (as candidates, voters and monitors).

**main operations** part, this part is used answer the five given queries and contain other additional queries. It is made up of list of links that are linked to queries. These list of links are nested in order to allow orderly execution on queries. Eg when you click on view winners



clicking view winners click on southern winners



click on Blantyre

finally click on Blantyre city

**QUERIES**

1. Find the poling centers where Presidential Candidate One lost by more than 5 votes to Presidential Candidate two.

SELECT polling\_centre\_name, votes FROM (SELECT polling\_centre\_name, COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) AS lvote WHERE (votes-5)> SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) OR (votes+5)< SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='northern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name)

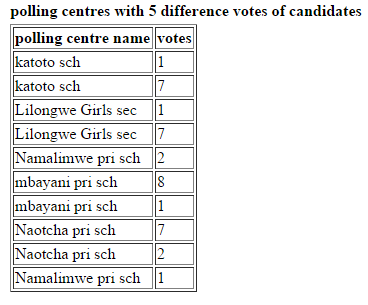
union

SELECT polling\_centre\_name, votes FROM (SELECT polling\_centre\_name, COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) AS lvote WHERE (votes-5)> SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) OR (votes+5)< SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='central'))) GROUP BY c.candidate\_id, v.polling\_centre\_name)

union

SELECT polling\_centre\_name, votes FROM (SELECT polling\_centre\_name, COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) AS lvote WHERE (votes-5)> SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name) OR (votes+5)< SOME(SELECT COUNT(v.candidate\_id) as votes FROM candidate c JOIN vote v ON c.candidate\_id=v.candidate\_id WHERE position\_name = 'President' AND (represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern')))) OR (represent IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern'))) GROUP BY c.candidate\_id, v.polling\_centre\_name)

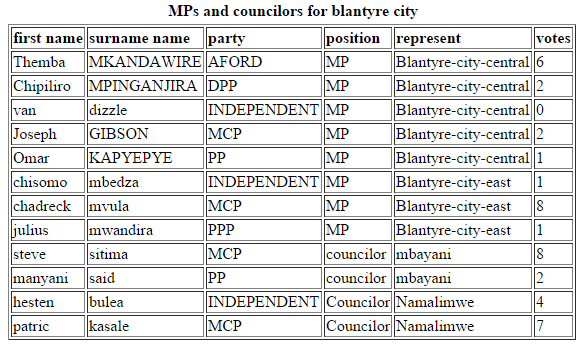
This will produce the following



1. Produce a report of all counselors, and MPs for Blantyre city arranged in the order of constituencies and parties.

SELECT fname AS name, sname AS surname, party\_code AS party, position\_name AS position, represent, (SELECT COUNT(candidate\_id) FROM vote WHERE vote.candidate\_id=K.candidate\_id ) AS votes FROM citizen c, candidate k WHERE c.citizen\_id = k.citizen\_id AND position\_name IN('MP','councilor') AND (represent IN ( SELECT constituency\_name FROM constituency WHERE constituency\_name IN('Blantyre-City-central','Blantyre-City-east')) OR represent IN (SELECT ward\_name FROM ward WHERE constituency\_name IN('Blantyre-City-central','Blantyre-City-east')))

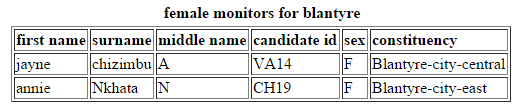
ORDER BY represent, party\_code;

This produce the following result

1. Find a list of all female monitors standing for all independent candidates for Blantyre urban.

SELECT fname, sname,mName, candidate\_id, sex, constituency FROM citizen, monitor WHERE sex='F' AND citizen.citizen\_id= monitor.citizen\_id AND citizen.citizen\_id IN (SELECT citizen\_id FROM monitor WHERE candidate\_id IN(SELECT candidate\_id FROM candidate WHERE party\_code='independent') AND polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name IN('Blantyre-City-central','Blantyre-city-east'))));

This produces the following result



1. Find who had the largest number of votes in all categories (president, MP, and counselor) in Blantyre.

SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name ='Blantyre-City-central'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =(SELECT MAX(Blantyre) AS southernMP FROM((SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-City-central'))) GROUP BY candidate\_id) AS derived))

union

SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-City-central'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =(SELECT MAX(Blantyre) AS southernMP FROM((SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-City-central'))) GROUP BY candidate\_id) AS derived))

Union

#councilor list from blantyre city east

SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-rural'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =( SELECT MAX(Blantyre) AS southernMP FROM((SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-rural'))) GROUP BY candidate\_id) AS derived))

union

SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-rural'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =( SELECT MAX(Blantyre) AS southernMP FROM(( SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-rural'))) GROUP BY candidate\_id) AS derived))

union

#councilor list from blantyre city east

SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name ='Blantyre-City-east'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =( SELECT MAX(Blantyre) AS southernMP FROM((SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='councilor')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-City-east'))) GROUP BY candidate\_id) AS derived))

union

#mp candidate for blantyre city east

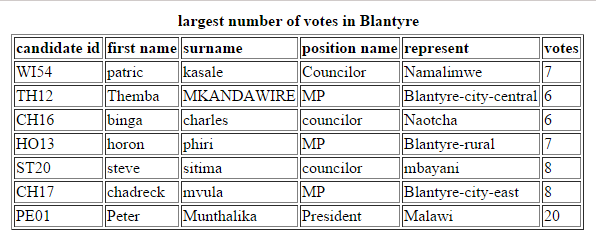
SELECT candidate.citizen\_id, candidate.candidate\_id, fname, sname, candidate.position\_name,party\_code, represent, Blantyre AS votes FROM (SELECT candidate\_id, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name ='Blantyre-City-east'))) GROUP BY candidate\_id) AS getID JOIN candidate ON getID.candidate\_id=candidate.candidate\_id JOIN citizen ON citizen.citizen\_id=candidate.citizen\_id WHERE Blantyre =(SELECT MAX(Blantyre) AS southernMP FROM((SELECT candidate\_id AS myId, COUNT(\*) AS Blantyre FROM vote WHERE polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE (candidate\_id IN(SELECT candidate\_id FROM Candidate WHERE position\_name='MP')) AND (ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name='Blantyre-City-east'))) GROUP BY candidate\_id) AS derived))

union

#selec maximum votes from the south

SELECT citizen\_id, candidate\_id, fname, sname, position\_name, party\_code, represent, MAX(votes) AS maximum FROM (SELECT citizen.citizen\_id, candidate.candidate\_id, fname, sname, position\_name, party\_code, represent, (SELECT COUNT(candidate\_id) AS vID FROM vote WHERE vote.candidate\_id=candidate.candidate\_id AND position\_name='President' AND (vote.polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN (SELECT ward\_name FROM ward WHERE constituency\_name IN (SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern')))))) AS votes FROM candidate LEFT JOIN citizen ON citizen.citizen\_id=Candidate.citizen\_id WHERE position\_name='President') AS myTable GROUP BY citizen\_id, candidate\_id, fname, sname, position\_name, party\_code, represent HAVING maximum=(SELECT MAX(votes) AS maximum FROM(SELECT citizen.citizen\_id, candidate.candidate\_id, fname, sname, position\_name,party\_code, represent, (SELECT COUNT(candidate\_id) AS vID FROM vote WHERE vote.candidate\_id=candidate.candidate\_id AND position\_name='President' AND (vote.polling\_centre\_name IN(SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN (SELECT ward\_name FROM ward WHERE constituency\_name IN (SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name='southern')))))) AS votes FROM candidate LEFT JOIN citizen ON citizen.citizen\_id=Candidate.citizen\_id WHERE position\_name='President') AS myTable)

This produces the folowwing result



1. Produce a report on regional voting patterns for presidents, MP's and counselors. i.e. how many people from the southern region voted for southern region members, etc.

SELECT region, COUNT(DISTINCT v.citizen\_id) AS votes FROM vote v JOIN citizen ci ON v.citizen\_id=ci.citizen\_id WHERE (ci.citizen\_id IN(SELECT citizen\_id FROM citizen WHERE constituency IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='northern'))))) AND region='northern' AND (v.polling\_centre\_name IN (SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='northern')))))) GROUP BY region

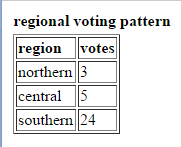
union

SELECT region, COUNT(DISTINCT v.citizen\_id) AS votes FROM vote v JOIN citizen ci ON v.citizen\_id=ci.citizen\_id WHERE (ci.citizen\_id IN(SELECT citizen\_id FROM citizen WHERE constituency IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='central'))))) AND region='central' AND (v.polling\_centre\_name IN (SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='central')))))) GROUP BY region

union

SELECT region, COUNT(DISTINCT v.citizen\_id) AS votes FROM vote v JOIN citizen ci ON v.citizen\_id=ci.citizen\_id WHERE (ci.citizen\_id IN(SELECT citizen\_id FROM citizen WHERE constituency IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='southern'))))) AND region='southern' AND (v.polling\_centre\_name IN (SELECT polling\_centre\_name FROM polling\_centre WHERE ward\_name IN(SELECT ward\_name FROM ward WHERE constituency\_name IN(SELECT constituency\_name FROM constituency WHERE district\_code IN(SELECT district\_code FROM district WHERE region\_name=(SELECT region\_name FROM region WHERE region\_name='southern')))))) GROUP BY region

This query produces the following result.



**ADDITIONAL QUERIES**

in order to run the system effectively, details must be entered in order for example for you to vote you need to be a citizen therefore you need to register first with proper details otherwise if your location is unidentified then you cannot vote because system will not know which list of candidate are available for you and data duplication is not allowed by checking if entered details are available to database. Every voter is given candidates from his or her constituency. Only manual entering of votes allows candidate to vote for any candidate at any location but this electronic one restrict that.