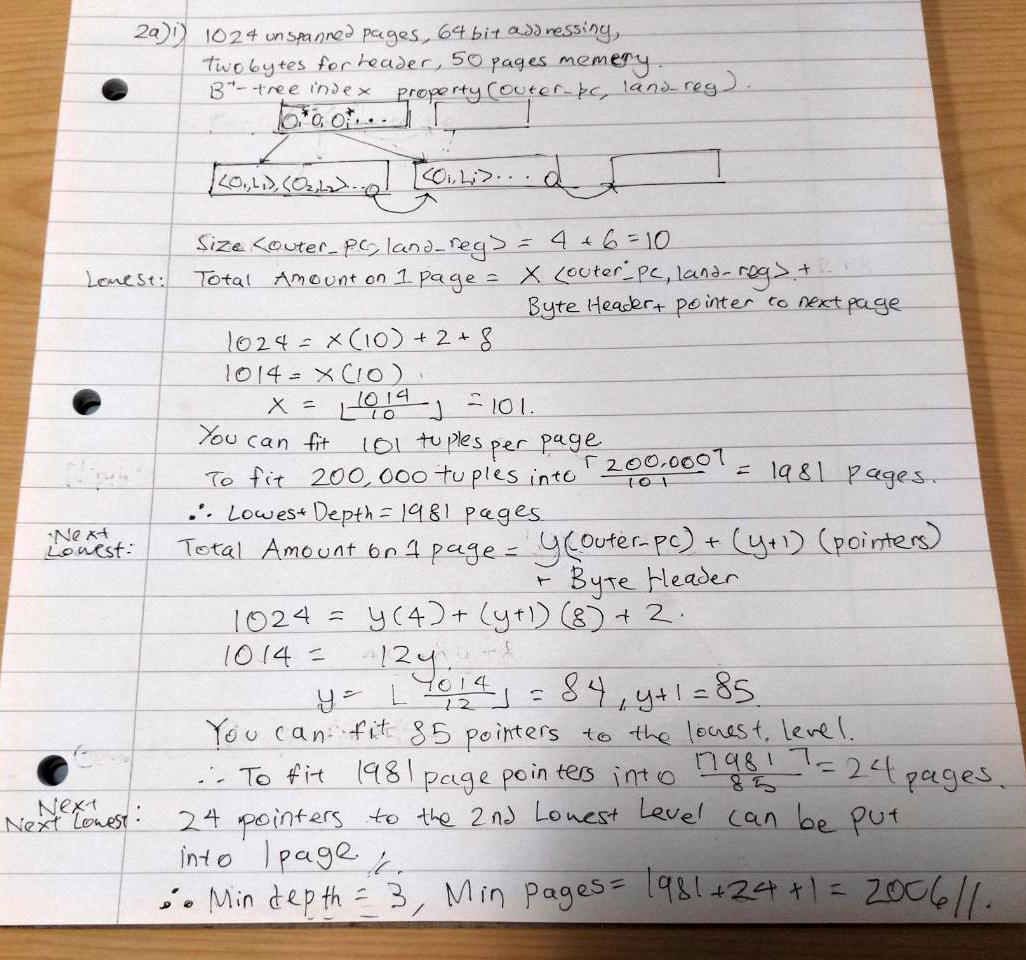
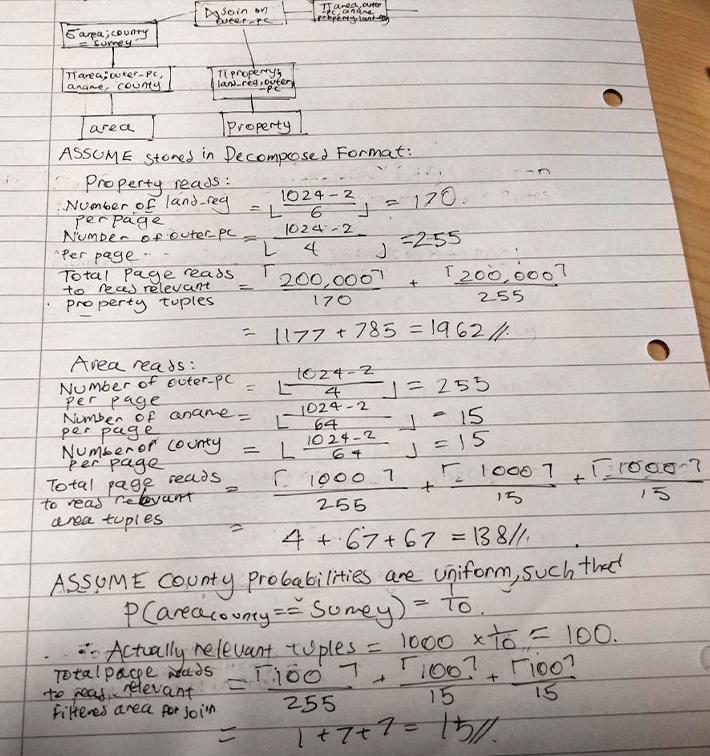
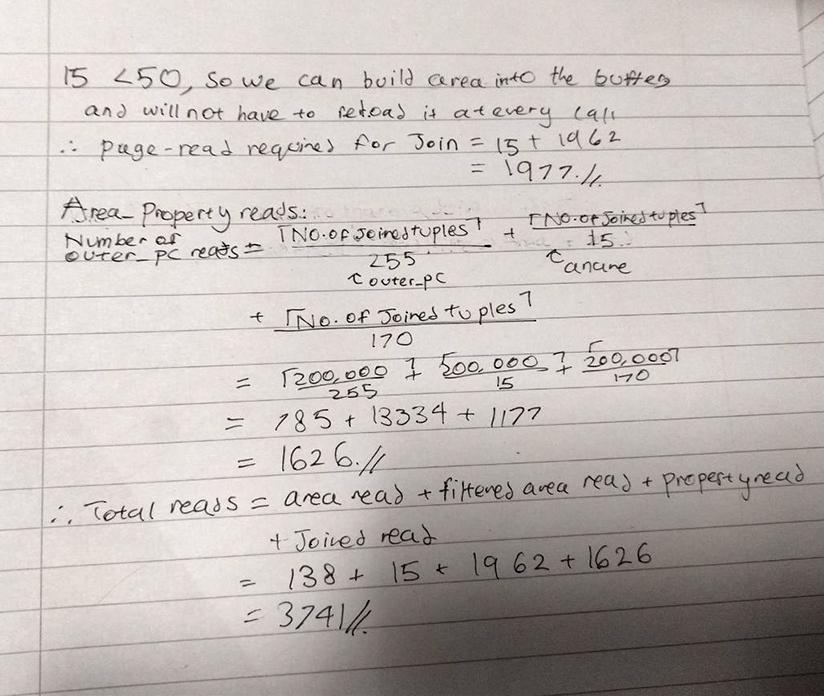
Q1 not examinable.

Q2.a) i)

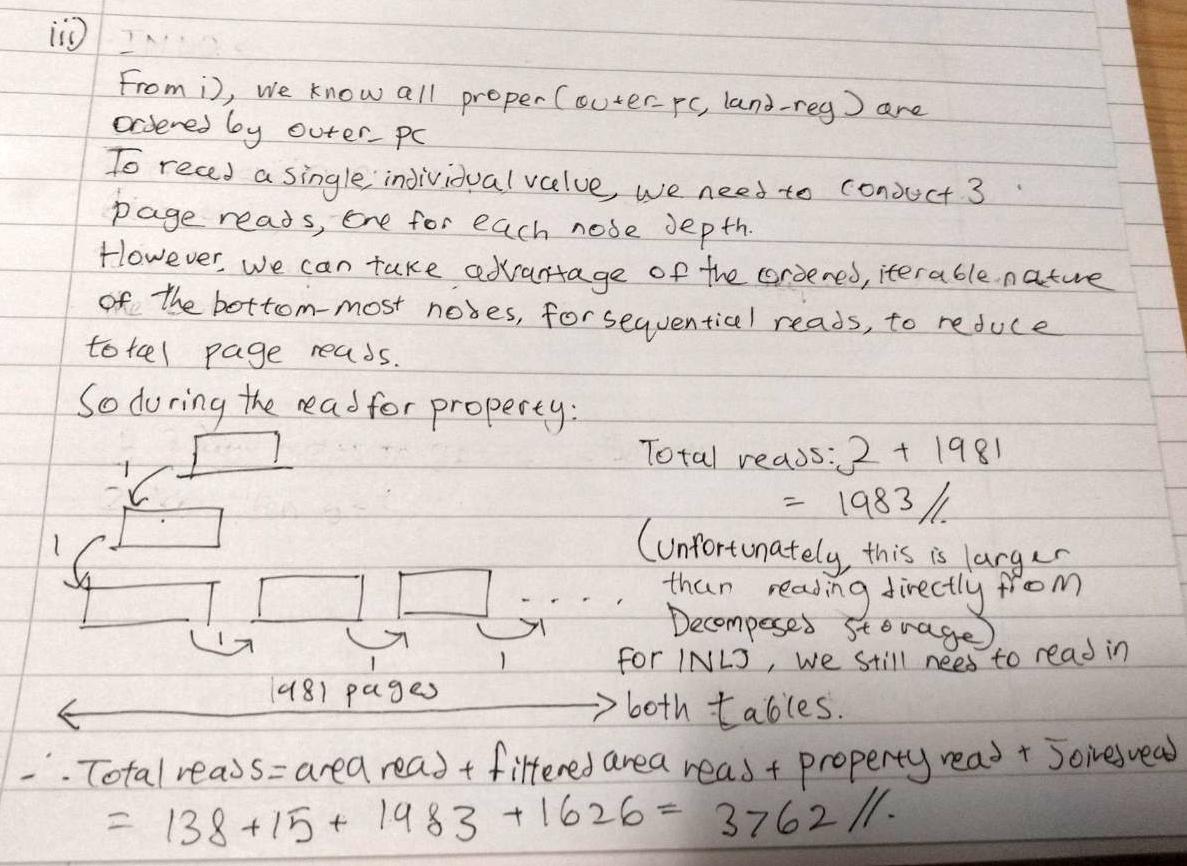


a) ii)





a) iii)



a)iv)  
Same as our Buffered BNLJ, 3741

bi)

Not CSR

Anomaly: Lost Update as w2 is using old read data

Recoverable

??????

**Anomalies**

Lost Update: r\_2[a\_sw19] < w\_1[a\_sw19] < w\_2[a\_sw19]

Dirty Write: w\_1[a\_sw19] < w\_2[a\_sw19] < c\_1

**Conflicts**

4 in total

When constructing the SG there’s a cycle therefore not CSR. For recoverability, the commit order is “C1 < C2” which is not met by all conflicts, therefore not recoverable.

ii)

CSR (w3[ae8] -> r2[ae8])

~~Anomaly: Dirty Reads as c3 is committing before c2~~

None of them

?????

No anomalies or conflicts, therefore CSR and recoverable

3) a) Companies that have no leases, but have telephone numbers, return cno, cname and telephone number count

Not absolutely sure of the answer so take it with a pinch of salt

Company\_and\_lease =

JOIN company BY cno LEFT,

lease by cno;

Company\_without\_lease =

FILTER company\_and\_lease

BY lease::cno IS NULL;

Company\_cno\_cname\_without\_lease =

FOREACH company\_without\_lease

GENERATE cno, cname;

Company\_and\_numbers =

JOIN Company\_cno\_cname\_without\_lease BY cno LEFT,

Telephone BY cno;

Company\_number\_groups =

GROUP company\_and\_numbers BY cno;

Company\_and\_number\_counts =

FOREACH Company\_number\_groups

GENERATE group AS cno,

COUNT(telephone.number) AS no\_telephone;

Company\_with\_numbers =

FILTER Company\_and\_number\_counts

BY no\_telephone > 0;

Cno\_cname =

FOREACH company

GENERATE cno, cname, no\_telephone

b) i)

Since we are dealing with between ‘S’ and ‘TZ99’, we send our queries to sites 2 and 4

LTM2:

SELECT rates, agent, outer\_pc

INTO ltm2

FROM property

WHERE outer\_pc BETWEEN ‘S’ AND ‘TZ99’

LTM4:

SELECT outer\_pc, county

INTO ltm4

FROM area

WHERE outer\_pc BETWEEN ‘S’ AND ‘TZ99’

GTM:

SELECT area.county AS county, property.agent AS agent, SUM(property.rates) AS rates

FROM ltm2 NATURAL JOIN ltm4

GROUP BY property.agent, area.county

b)ii)

lease1 = lease SEMI JOIN property1

lease2 = lease SEMI JOIN property2

rental1 = rental SEMI JOIN property1

rental2 = rental SEMI JOIN property2

telephone1 = telephone SEMI JOIN lease1

telephone2 = telephone SEMI JOIN lease2

company1 = company SEMI JOIN rental1

company2 = company SEMI JOIN rental2

rent1 = rent SEMI JOIN (PROJECT cno, landreg lease1)

rent2 = rent SEMI JOIN (PROJECT cno, landreg lease2)

b)iii) company(subsidiary\_of) -> company(cno) would require intersite communication as the two companies might have different outer post codes(or so i assume)

4)a)i)

DJLJ

(size(inner\_pc) + size(outer\_pc) + size(land\_reg))x|property| + (size(outer\_pc) + size(county))|area|

= (3 + 4 + 6)x200,000 + (4 + 64)x1,000 = 2,668,000B

DJRJ

(size(inner\_pc) + size(outer\_pc) + size(land\_reg) + size(county))x|property|

= (3 + 4 + 6 + 64)x200,000 = 15,400,000B