CS525 - Advanced DataBase Organization
Quiz-1

1.1.1   Select distinct fromcity from bus
where fromcity in (Select distinct tocity from bus)

1.1.2   Select a.bnumber, tocity, arrivaltime from bus a, schedule b
where upper (fromcity) = 'CHICAGO'
AND to_date (departureTime) = to_date ('01 JAN 2014')
AND a.bnumber = b.bnum
AND a.company = b.company.

1.1.3   WHITEDOG
PICOBUS.

1.1.4   Select min(a.price + b.price) lowest fare from
(Select bnumber, price, fromcity, tocity from bus
where fromcity in (Select name from city where state = 'WA'
and tocity = 'Chicago') a,
(Select bnumber, price, fromcity, tocity from bus
where tocity in (Select name from city where state = 'WA'
and fromcity = 'Chicago') b
where a.fromcity = b.tocity :

1.1.5 Select company, count(*) from bus
       group by company
       having count(*) >= 5;

1.1.6 Select fromcity, bnum, to_char(departuretime, 'HH24:MM')
       from bus b, schedule a
       where a.bnum = b.bnumber

1.1.7 Select distinct name from city
     where name not in
     (Select distinct fromcity from bus
     union
     Select distinct tocity from bus);

1.1.8 Select fromstate, count(*) from (
     (Select a.bnumber, a.fromcity, b.tocity, a.slate fromstate,
      b.slate tostate from
     (Select b.bnumber, fromcity, tocity, slate from city a, bus b
     where name = fromcity) a,
     (Select b.bnumber, fromcity, tocity, state from city a, bus b
     where name = tocity) b
     where a.bnumber = b.bnumber))
     where fromslate = tostate
     group by fromstate;

1.2.1 $\Pi_{num}(\sigma_{company = 'whitedog' \lor company = 'picobus'}(Bus))$

1.2.2 $\Pi_{company}(\sigma_{fromcity \: != 'chicago'}(Bus))$

1.2.3 $sq \leftarrow {}_{(company, count(bNum))}G_{count(bNum)>3}{}^{(schedule)}$

$q \leftarrow {}G_{sum(count(bNum))}(q)$

1.2.4 $q_1 \leftarrow \Pi_{tocity}(Bus)$

$q \leftarrow \Pi_{fromcity}(\sigma_{fromcity = (q_1)}(Bus))$

1.2.5 $\Pi_{company}({}G_{count(*)\geq 2}[schedule(S.company) \bowtie schedule(0.company)])$
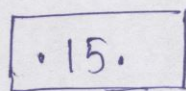
1.3.1

Step 1:   · 15 ·

Step 2:   · 15 · 44

Step 3:   · 15 ·

   · 3 · → · 15 · 44

Step 4:   · 15 · 44 ·

   · 3 · → · 15 · → · 44 · 47

Step 5:   · 44 ·

   · 15 ·   · 47 ·

   · 3 → · 15 · → · 44 → · 47   · 48

Step 6:

```
                    · 44 ·
            ┌─────────┴──────────┐
          · 15 ·            · 47 ·  48 ·
       ┌────┴────┐        ┌────┼──────────┐
    · 3 ·    · 15 ·    · 44 ·  · 47 ·   · 48 · 60
```

Step 7:

```
                    · 44 ·
           ┌──────────┴───────────┐
         · 15 ·               · 47 · 48
       ┌───┴────┐          ┌────┴─────┬──────┐
    · 3 · → · 15 · 32   · 44 · → · 47 → 48 | · 60
```

Step 8:

```
                    · 44 ·
          ┌──────────┴───────────┐
       · 15 · 23             · 47 · 48 ·
     ┌────┼──────┐         ┌────┴───┬────────┐
  · 3 · → 15  · 23 · 32 → · 44 · → · 47 → · 48 · 60
```

1·3·1

delete 68

65

delete 80 (struck through)

5 · 23

·65· 80 · 121 ·

·1·2·4· → ·14·16·8· → ·23·32·40· → 65· 66· 67·   ·80·90·100   ·121·200·220

delete 80 (struck through)

delete 80

65

5 · 23

6 7· 90 · 121
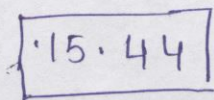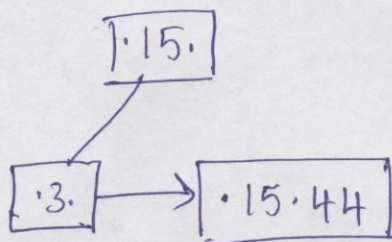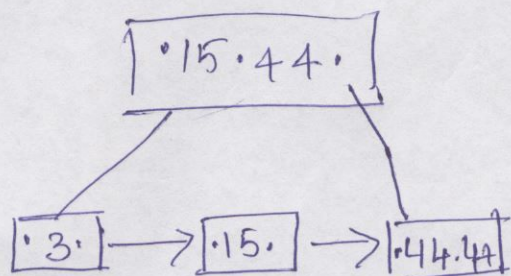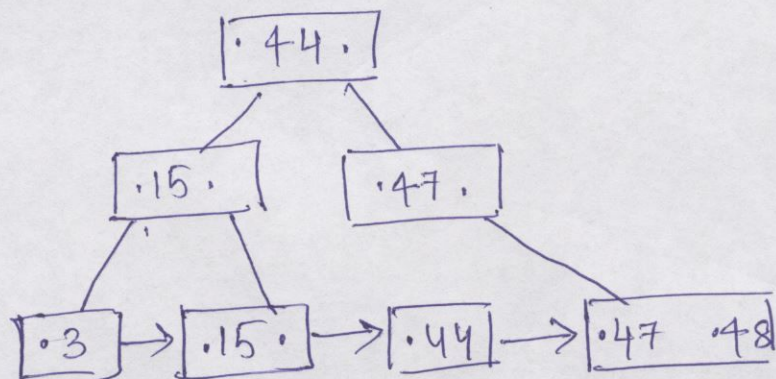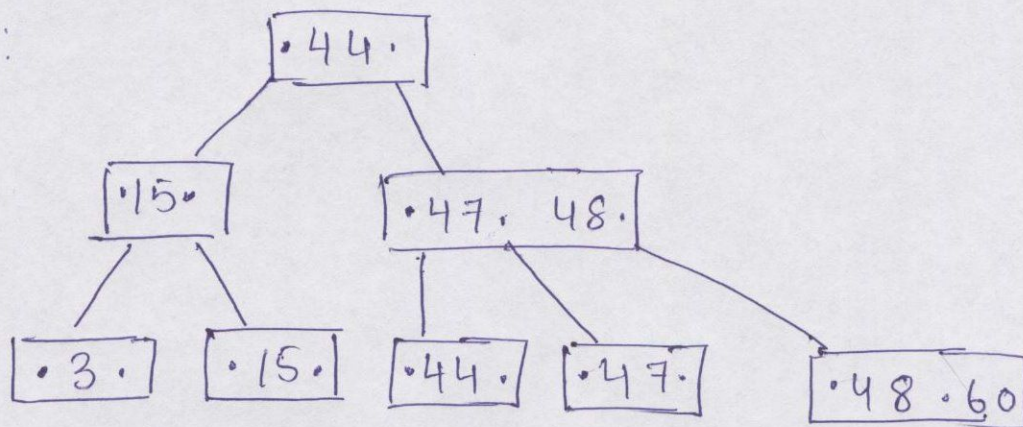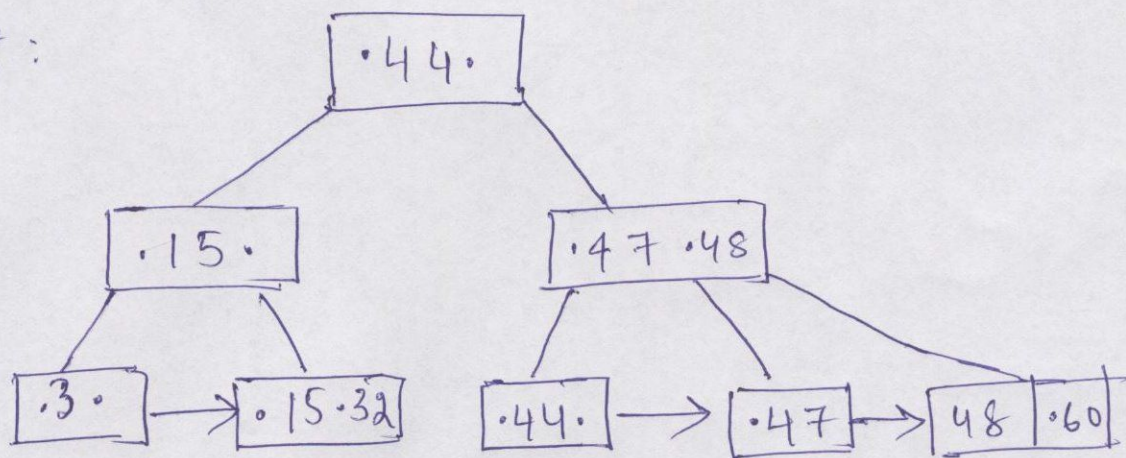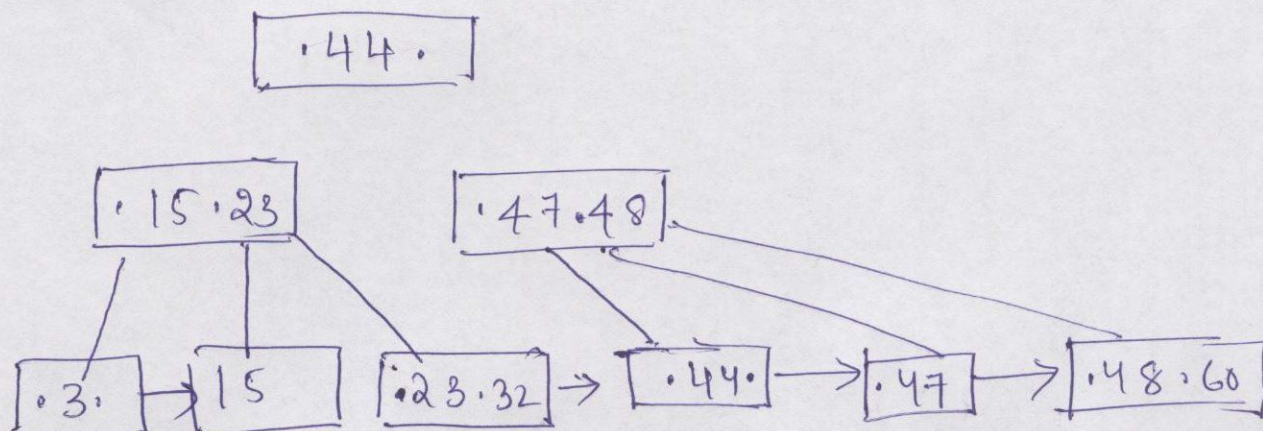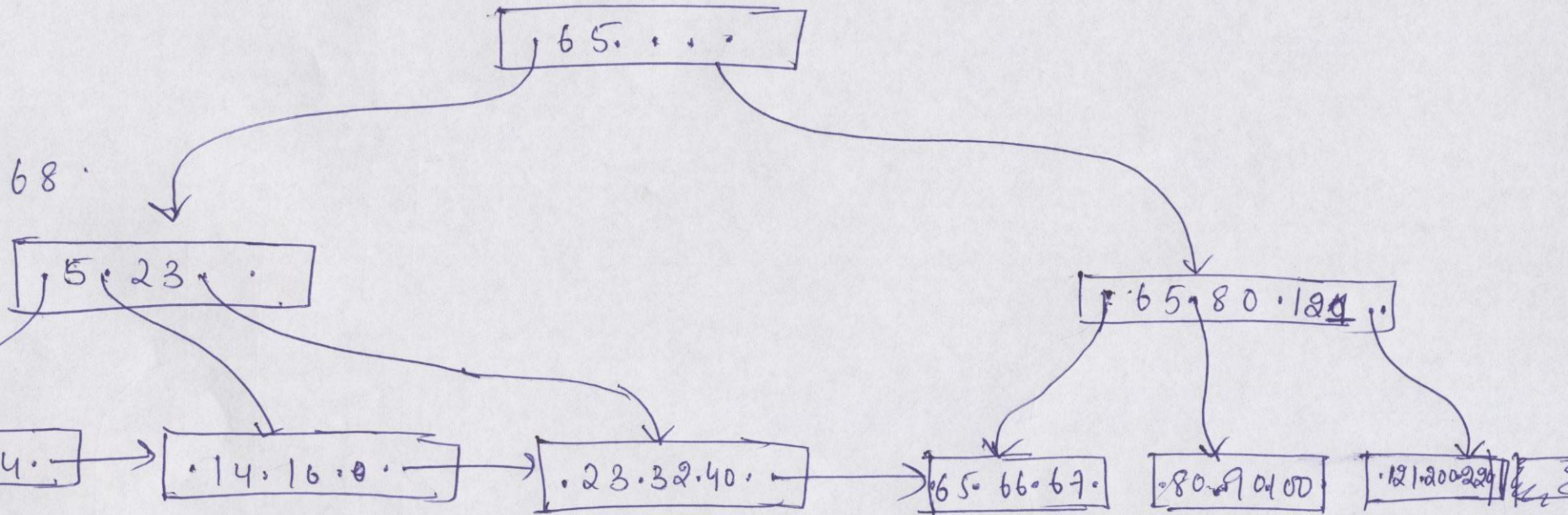
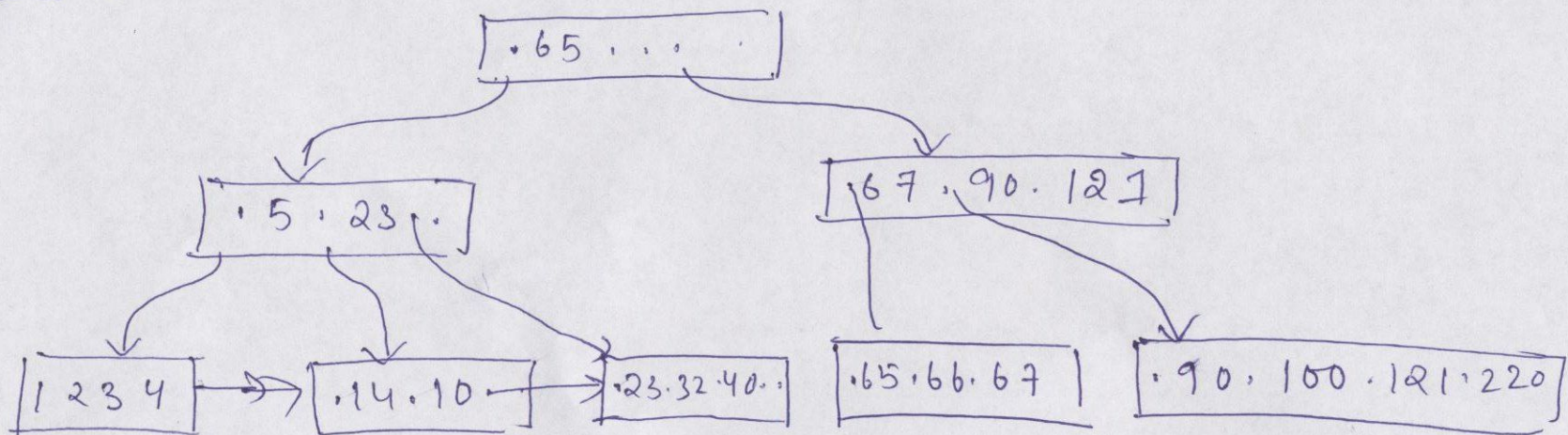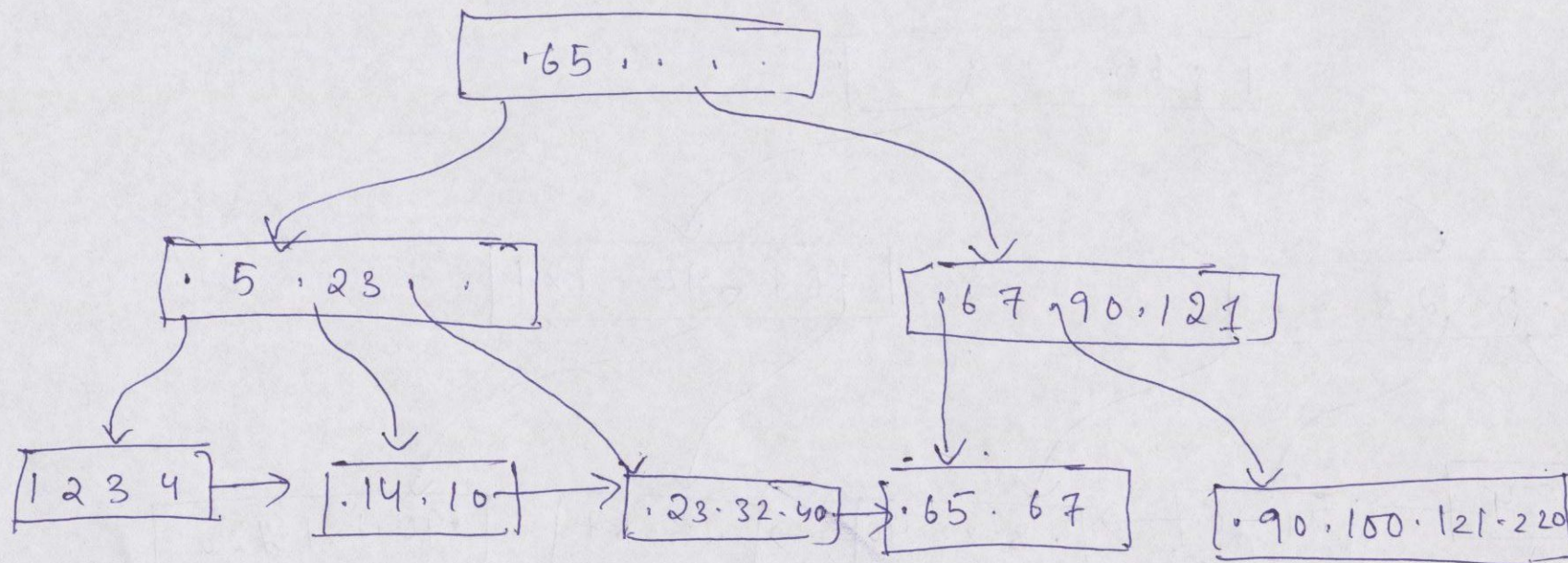·1·2·4· → ·14·16· → ·23· 32·40· → 65·66·67·   ·90 · 100 ·   121 · 200 · 220
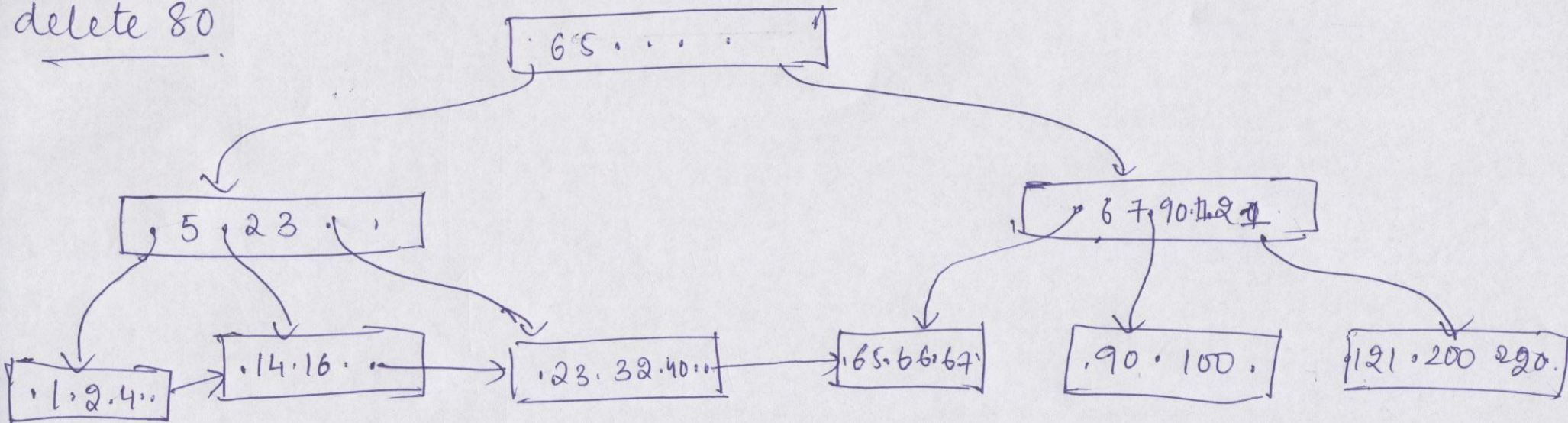
Insert 4
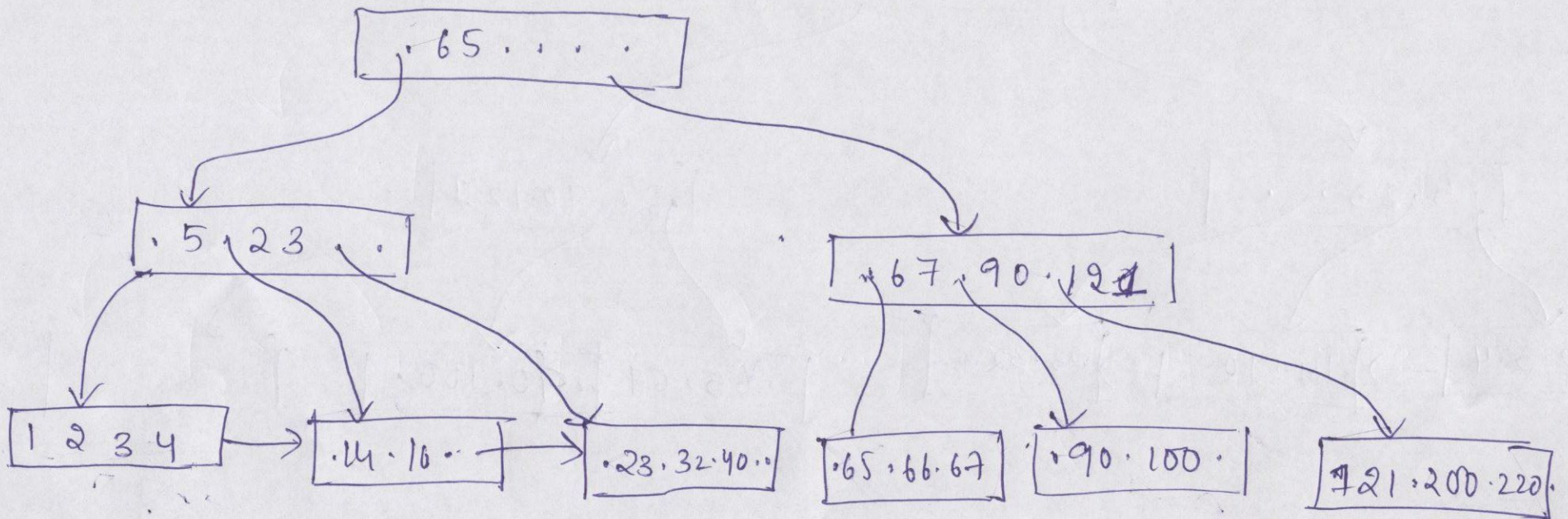
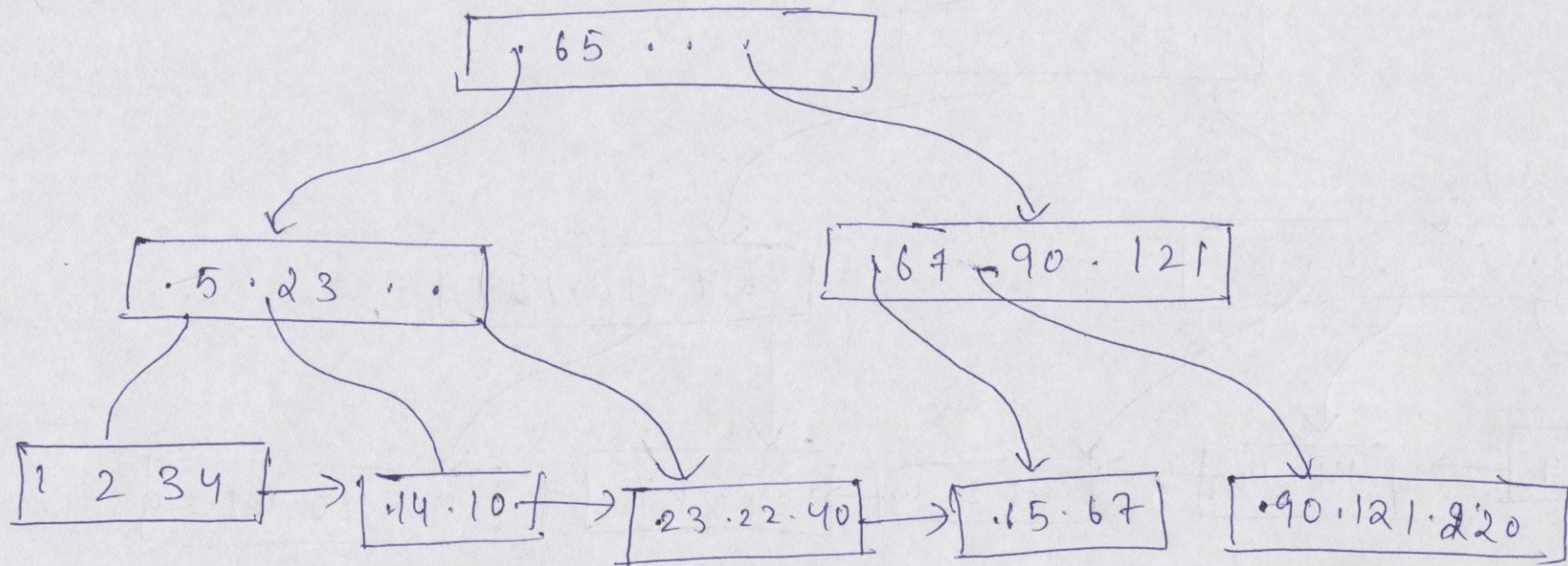
delete 200

delete 66

delete 100

1.4.1 $\quad T(q) = \dfrac{T(beer)}{V(beer, Type)} = \dfrac{10000}{10}$

$$= 1000.$$

1.4.2 $\quad f = \dfrac{4,500,000,000 - 20,000,000 + 1}{4500,000,000 - 300000 + 1}$

$T(q) = f \times T(brewery)$

$\qquad = 0.99562 \times T(brew)$

$\qquad = 0.99562 \times 400$

$\qquad = 398.24.$

1.4.3 $\quad T(q) = \dfrac{T(beer) * T(brew) * T(city)}{Max(V(beer, brand), V(brand, brew))) \times Max(V(brew, city), V(loc, city))}$

$\qquad = \dfrac{10000 \times 400 \times 2000}{400 \times 2000}$

$\qquad = 10000.$