

Homework 5

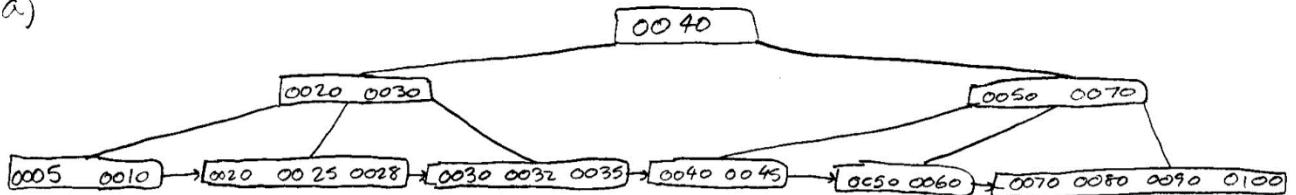
1.

- a. Hotel(*hotelNo*, *hotelName*, *city*)
  - i. *hotelNo*: Secondary index because it will frequently be used in joins.
  - ii. *hotelName*: Secondary index because it will frequently be used in queries that use GROUP BY and ORDER BY.
  - iii. *city*: Secondary index because it is an attribute that will be heavily used in selection queries, such as selecting all hotels in London.
- b. Room(*roomNo*, *hotelNo*, *type*, *price*)
  - i. *roomNo*: Secondary index because it will frequently be used in selection queries. For example, if a potential customer asks for a price range and wants know what floor they will be on, hotel management can quickly find all of these.
  - ii. *hotelNo*: Secondary index because it will frequently be used in joins.
  - iii. *type*: Secondary index because it may be used in ORDER BY or GROUP BY clause to determine, for example, how many empty single rooms are available over a date range. This could be used by hotel management for advertising purposes or other related matters.
  - iv. *price*: Clustering index because it is most likely to be used in a range query. Note that it is a clustering index over a secondary index because it is will be used in an aggregate function less often than in a range query.
- c. Booking(*hotelNo*, *guestNo*, *dateFrom*, *dateTo*, *roomNo*)
  - i. *hotelNo*: Secondary index because it will frequently be used in joins.
  - ii. *guestNo*: Secondary index because it will frequently be used in joins. This could be used specifically with the Guest relation, as this is a FK.
  - iii. *dateFrom*: Clustering index because it will frequently be used in a range query. This could be used when finding potential dates of stay and their availabilities.
  - iv. *dateTo*: Clustering index because it will frequently be used in a range query. This could be used when finding potential dates of stay and their availabilities.
  - v. *roomNo*: Secondary index because it will frequently be used in joins, as it is a FK and can be used to compare dates of availability and price, for example.
- d. Guest(*guestNo*, *guestName*, *guestAddress*)
  - i. *guestNo*: Primary index because information is clustered using the primary key. Guests can have the same name and guest addresses are long strings that will probably never be searched for directly.

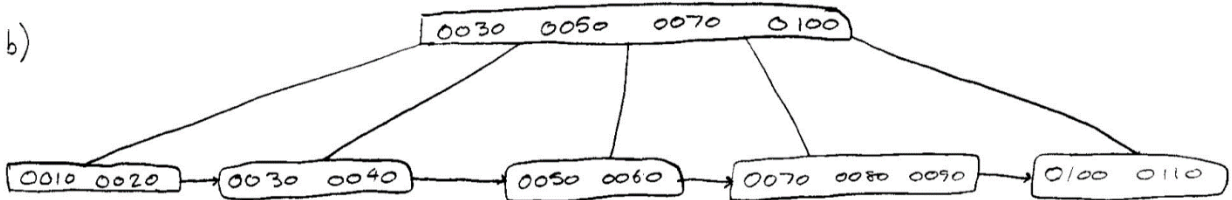
- ii. *guestName*: No index, this will be a long character string and will not often if ever be searched for directly because there is a high probability there will be guests with the same name.
- iii. *guestAddress*: No index, this will be a long character string and will not often if ever be searched for directly.

2.

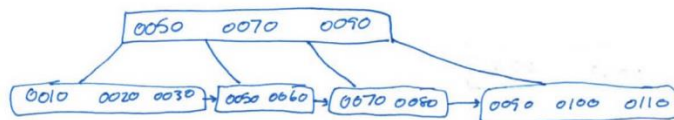
a)



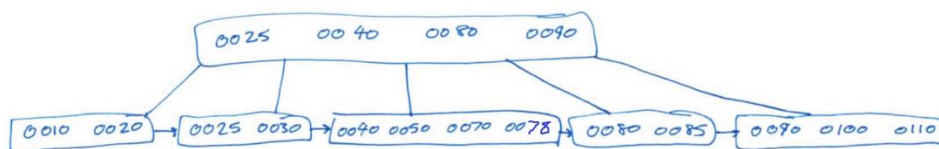
b)



c)



d)



3. Final Diagram below (made using draw.io)

