Assignment-3

Name : Ummay Maimona Chaman

ID : 22301719

Section : 09

Course : CSE370

Ans: to the Q: No-1

(i) Yes, the following relation is in 1NF

Because,

1. There is no composite or multivalued attributes
2. There exists no nested relations

So, this is in 1NF

(ii) No, the relation is not in 2NF

Because,

It's in 1NF but there exists partial functional dependency.

We know that in 2NF, there should not have partial functional dependency.

2NF:

E1 | Engineer_ID | Engineer_Name | Total_Repairs | Commission_Percentage | Engineer_phone |

E2 | [illegible]_ID | Date_Assigned | Issue | Priority_level | Service_change |

E3 | [illegible]_ID | Cus_Name | Cus_Phone |

E4 | C_ID | E_ID | D_Assigned | D_Required |

(III) This is not in 3NF
As we have already done at case (II), the 2NF form, but still there exists some transitive functional dependencies.
There are: FD4 and FD5

3NF:

EC1 | Total_Repairs | C-Percentage |

EC1 | E_ID | E_Name | Total-Repairs | E_Phone |

EC3 | P_level | S_Charge |

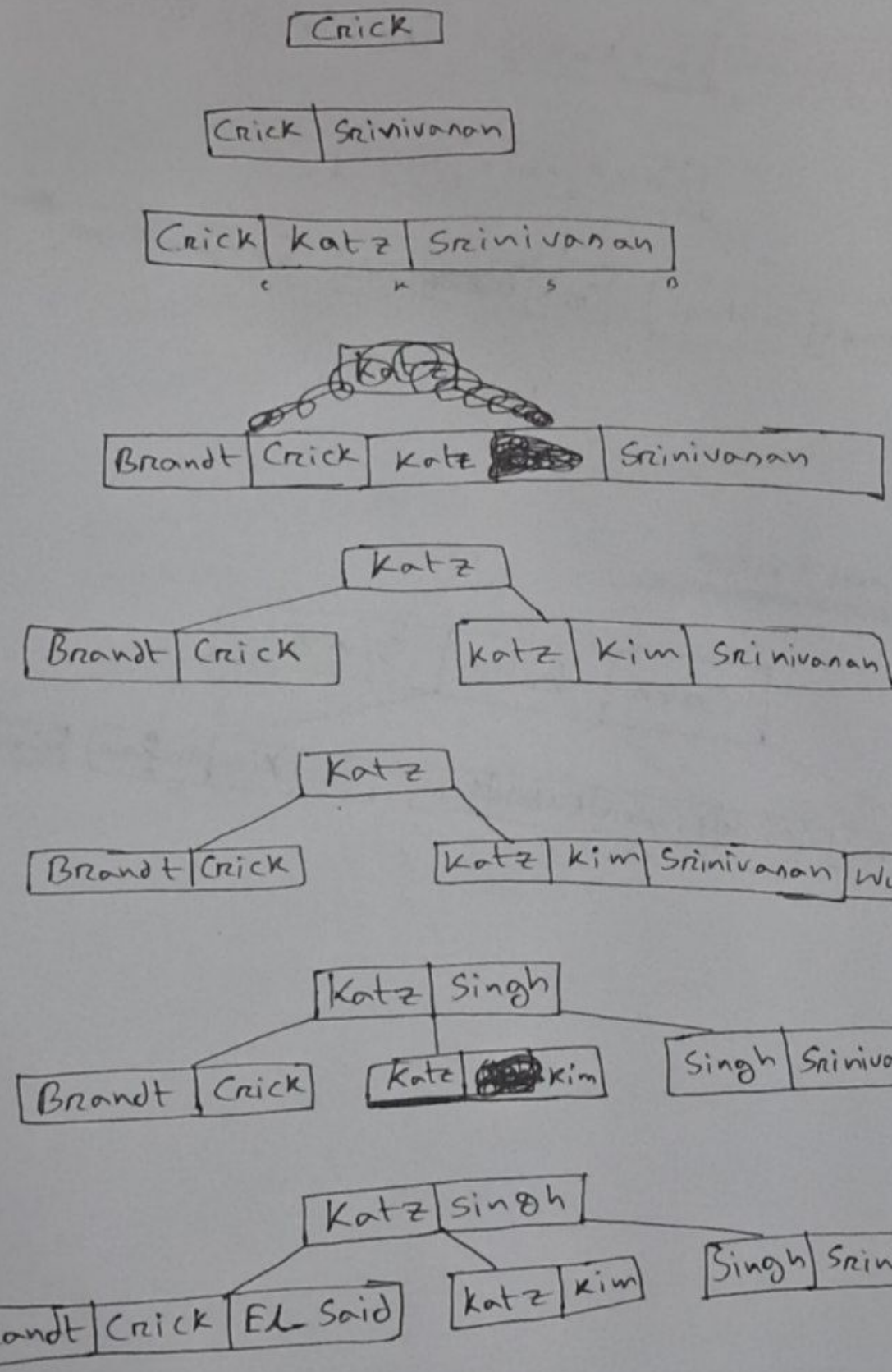
EC4 | C_ID | D-Assigned | Issue | P_level |

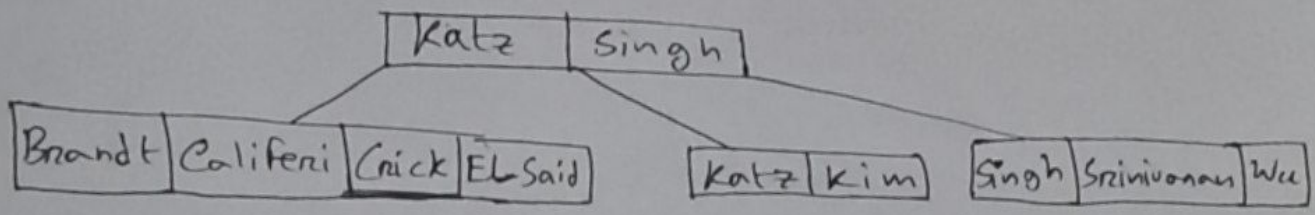
E3 | C_ID | Cus-Name | Cus-Phone |

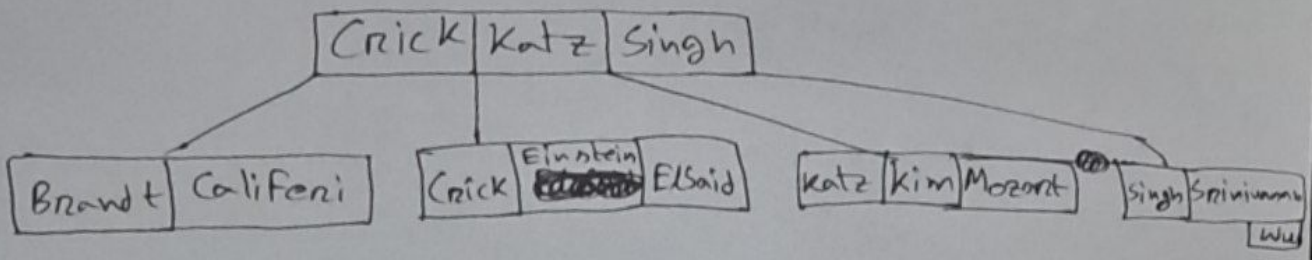
E4 | C_ID | E_ID | D_Assigned | D_Required |

Ans to the Q No-2

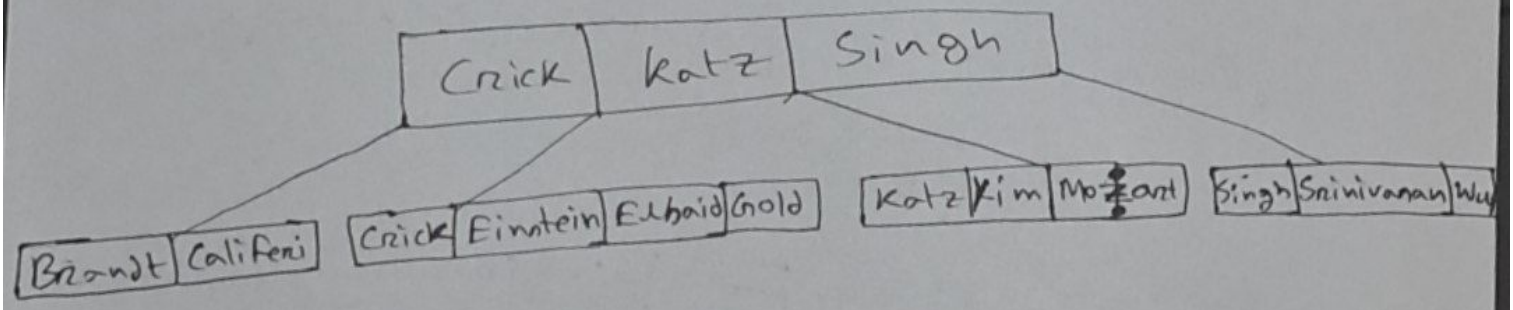
Given, n = 5




Katz
Singh
Brandt
Califeri
Crick
EL Said
Katz
Kim
Singh
Srinivasan


Crick
Katz
Singh
Brandt
Califeri
Crick
Einstein
ElSaid
Katz
Kim
Mozart
Singh
Srinivasan

Final tree


Crick
Katz
Singh
Brandt
Califeri
Crick
Einstein
Elbaid
Gold
Katz
Kim
Mozart
Singh
Srinivasan

Answer to the Q. NO-3

Given,

Hash function, h = (sum of 1st and last digit in ID) % 7

[redacted] Index = 7

and each bucket can house 2 index entries

h(76766) = (7+6) % 7 = 6
h(10101) = (1+1) % 7 = 2
h(45565) = (4+5) % 7 = 2
h(83821) = (8+1) % 7 = 2
h(98345) = (9+5) % 7 = 0
h(12121) = (1+1) % 7 = 2

h(76543) = (7+3) % 7 = 3
h(32343) = (3+3) % 7 = 6
h(58583) = (5+3) % 7 = 1
h(15151) = (1+1) % 7 = 2
h(22222) = (2+2) % 7 = 4
h(33465) = (3+5) % 7 = 1

So, the handling of Bucket over-flow using forward chaining: