CSE 208:
Data Structures & Algorithms Sessional II

Offline 7: Hash Table

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Hash Functions which are used to implement the code are below here →

Hash Function-1:

```
int hashfunction(string key)
  {
     int temp = 1;
     int hashval = 0;

     for (int i = 0; i < key.length(); i++)
     {
        hashval = (hashval + (key[i] - 'a' + 1) * temp) % tablesize;
        temp = (temp* 32) % tablesize;
     }
     return (hashval % tablesize + tablesize) % tablesize;
  }
```

Hash Function-2:

```
int hashfunction2(string key)
{
   int hashvalue=0,temp;
   for(int i=0; i<key.length(); i++)
   {
      temp=key[i]>60?key[i]+20:key[i]-40;
      hashvalue+=(hashvalue*10+temp)%tablesize;
   }
   return (hashvalue%tablesize+tablesize)%tablesize;
}
```

Auxiliary Hash Function:

```
int auxHash_function(string key)
{
   int hashval=0;
   for(int i=0; i<key.size(); i++)
   {
      hashval+=(key[i]*3)%tablesize;
   }
   return (13-(hashval%13))%tablesize;
}
```

For N'=5000,Hash Table Size =5003

Collision Resolution Method	Hash 1		Hash 2	
	# Of Collisions	Average Probes	# Of Collisions	Average Probes
Chaining Method	1806	1.448	1831	1.431
Double Hashing	63551	9.806	90936	16.917
Custom Probing	29464	6.571	29738	7.155

For N'=10000,Hash Table Size =10007

Collision Resolution Method	Hash 1		Hash 2	
	# Of Collisions	Average Probes	# Of Collisions	Average Probes
Chaining Method	3667	1.45	3647	1.469
Double Hashing	91169	10.983	122931	14.199
Custom Probing	62726	5.821	63465	6.751

For N'=20000,Hash Table Size =20011

Collision Resolution Method	Hash 1		Hash 2	
	# Of Collisions	Average Probes	# Of Collisions	Average Probes
Chaining Method	7413	1.429	7342	1.439
Double Hashing	421923	16.63	425103	13.65
Custom Probing	143547	5.455	135571	5.512