Friday, May 6, 2022 9:55 AM

equals and hash code contract !!

If you say that two objects are equal (equals method returning true) then the hashcode of the two objects must be same !!!!

By default implementation in Object class

```
public boolean equals(Object obj)
{
    If( this == obj)  return true;   //this means there are only 2 references but single object
    Else return false;
}
```

Addresses	
101	o
102	0
103	0

By default the hashcode of an object is the address of that object on the heap .

Hashing

Strings = red, green ,blue, yellow , turquoise , white

|

Generate the hashcode for each element u want to add

|

```
hashcode(element)
{
    return length(element)  ;   return 1
}
```

|

|use the hashcode as bucket index where the element is kept

|

Buckets of hash table

hash code	
1	
2	
3	red
4	blue
5	green , white
6	yellow

7	
8	
9	turquoise
10	

Find if black is in the list ?
|
|
Get the hashcode for black----- 5
|
| check in bucket 5 ---if present hurray !!

Search Complexities
Hashing O(1)
ArrayList O(n)
TreeSet O(logn)

TO keep the search complexity as O(1) ------ what is important ? Hashcode must return unique numbers !!!!

Java hashcode default implementation ---- hashcode is the address of the object ---- always unique !!!!

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java .util. Map interface DOES NOT extend Collection interface

Map ---- data comes as a pair !!!!! Key,value

HW - Write a class study.collections.Users

Property TreeMap<String,String> userinfo

Public void addUser(String uname,String pwd)

Public void showAllUserNames () --- show only user names

Public String getPassword(String uname)

Public void changePassword( )
{
Ask user to enter username and older password
If that matches then ask user to enter new password
Set the new password
Else
Throw UnAuthorrizedException (u will have to write it)
}

Public void removeEntry(String uname, String pwd)

{

If the uname pwd match then remove the entry
Else throw UnAuthorizedException

}

Write a class Admin in the same package

Main

create the Users object ----

show menu

a. Login -------- enter uname and pwd } if it matches the entry then print welcome else print not allowed
b. Show all users
c. Change password
d. Remove user
e. quit

IO in Java -------

Input Output

Input
Source ----------destination
Input device ----------DMA----------**JVM** (java process space)

Output
source ----------destination
JVM ----------DMA----------**Output device**

IO related classes are in java.io package

InputStream OutputStream

Stream ---------- FileInputStream and FileOutputStream

x= sc.nextInt() } 4 bytes clubbed together and interpreted as integer

sc.nextFloat() } 4 bytes clubbed together and interpreted as float
d= sc.nextDouble() }8 bytes clubbed together and interpreted as double value

10000000 000000000 000000101 000000001

In Java Reader and Writer Classes

Reader classes = purely for reading text data } TEXT IO ex BufferedReader class
Writer classes = purely for writing text data } TEXT IO --- ex PrintWriter class

HW ------

Write a class that reads creates a file names.txt
Ask the user to enter firstname and lastname
Transform the name into title case and save it in the file
User enters prachi goDbole
Transform -------- Prachi Godbole
Save to file

Do it till user says quit !!!

Write a class that will
Read from the above file (store it in an arraylist<String>
Show menu

a. Show all names in the file
b. Show how many names are there in the file
c. Show names in sorted order with index
    1. Archana Naik
    2. Bhupesh Narang
    3. Prachi Godbole

d. Remove from file an entry if the user enters the index
f. quit

_____

HW ----------

Write a Thread that prints the tables of numbers from 1 to 20 in one in tables.txt
After printing each table --- show a sysout that table of 2 is done , sleep for 2 secs and then print again
Each table from 1 to 10
1*1=1
1*2=2
….
1*10=10

2*1=2
2*2=4
….
2*10=20

3*1=3
….

20*1=20

…

Write another thread in the same program that will accept a number from user
And print its power table in a file named powers.txt
for ex user enters 2
2 raised to 1 = 2
2 raised to 2 = 4
…
2 raised to 10 =
After it prints then again it should ask the user to enter next number
Then append the power table of next entered number in the file

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- Text IO to files }}} we used PrintWriter to write and we used Scanner and BufferedReader to read

* Binary IO }} we create binary files to save Objects to files and read objects from files

Text editor = notepad , wordpad, eclipse editor , vi editor = can open only TEXT IO files , Text files
.txt , .java , .cpp , .c

Binary files ---- we cannot open in text editor ----.exe , .class , .out, .gif , .jpeg, .png,. Wav,.mp3, .pdf, .docx , .ppt ,xsl

To save objects ---------- ObjectInputStream , ObjectOutputStream

If we want to save the objects , the class of that object MUST be Serializable !!!
Tagging interface --- no methods ----- java.io. Serializable
Class is permitting the object saving through Serializable !!!!!!

HW --- type the SaveObject file as discussed in class