**Day.11**

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| Collection framework and collection interfaces List, Queue, Set and Map |
| List classes |
| Set classes |
| Map classes |
| Queue classes |
| For-each method for collection and iterators |
| Comparator and hashCode () |
| Array classes |

**Q1**) A library has books and each book has a number . Members can borrow only one book from the library and they must return the book within a week's time. If exceeded, Rs.10 is charged as fine for each day from then on. If not returned even after a month, Rs.50 is charged for every subsequent day. For every subsequent month, 50 \* number of months is collected as fine.

At the beginning of every month, a bill is produced; for all the members, with a token amount of Rs. 100, as a mark of continuance of the membership. In cases where the fine is applicable, the fine amount is also added.

a) Write a java program to implement this application. The code must be able to take inputs to create books, members, dates (issue and return) and also print the bill at the end of every month. (1 hour)

**Q2**) User enters the date, in the form 7 July 2012. Display the following based on the week it falls on

print white for Mon

print red for Tue

print green for Wed

print yellow for Thru

print pink for Fri

Sat and Sun are not acceptable values.

**Q3**) Write a java program to display the silver jubilee, golden jubilee and diamond jubilee celebration dates of a movie, whose release date will be entered by the user. Assume that the movie will run successfully. (Silver Jubilee 25, Golden Jubilee 50, Diamond Jubilee 60, Platinum Jubilee 75). Note that, if these dates fall on a Sunday or any public holiday, then the date must be moved to next day

**Q4**) Coordinator adds the names of the participants who wish to participate in extempore. He also removes the names if the participants decides otherwise or if they don’t meet the required criteria.

• A list is sorted and split into a list of 5 participants and a seminar room number is allocated. This information is maintained as another list. Finally the application must display the list as :

Group 1: seminar room

participants name

Group 2: seminar room

participants name

and so on

**Hint**: Use the ArrayList and Arrays class.

**Q5**) Create a Vector object that can hold any type of object : Student or Teacher or HOD. Write a java code that creates these objects and inserts them into the list. Make sure that toString() is overridden in all the classes. Print out the list that displays the string representation of the object. It should also print the object type such as Student, Teacher or HOD.

**Q6**) Post fix expression for ((2+3)\*8+5+3)\*6 is 2 3+8 \* 5 3 + + 6 \*

Assuming that Post fix expression is given, find the result of the expression using Stack.

**Hint**:

1. Read the postfix expression from left to right character by character

2. If the input is an operand then push it onto the stack.

3. If the input is an operator then pop the two stack tops and perform the operation between the popped operands and push the result back into the stack.

4. Repeat the steps until we reach the end of the input.

**Q7**) Implement a railway ticket counter scenario where there are two queues- one general and one for senior citizen.

Tickets are issued such that for every one person in senior citizen queue, two persons in general queue are processed.

**Q8**) Write a program that takes input for 6 people who come at various points and print the list of people in the order of their processing sequence.

**Hint**: implement Queue interface

**Q9**) Use LinkedList to store list of Scores objects (name, score) that will be entered by the user. Make sure they are arranged in the descending order while they are inserted into the linked list. Display the linked list in the order of the rank of the student.

**Q10**) 10 volunteers are needed for Showcase of a new product. Write a program that will accept employees ids who will volunteer for this. Make sure that the ids are not duplicates. Display the ids in a sorted order.

**Q11**) Write a class representing thesaurus that has many synonyms for a single word mapped. User can use this to search meaning of the words they want.

**Q12**) Write a program to implement a telephone directory. Provide facilities to add, delete and search the telephone directory.

**Q13**) A shop has a list of product code , description and price. Some prices are listed in terms of kg and others are listed in terms of dozens. Customers buys the different products in different quantities. The application must display a bill with the product code , description , quantity and price per unit and total price.

Q14) Write a program

i. To create employee class with emp id, name , dept and salary

ii. Override the .equals() method to compare the employee object using emp id.

iii. Write a class to create different employee instances with same employee id and insert into a HashSet

iv. As per Hashset duplicates cannot exists, but if you see the HashSet of employee ids the instance of duplicate employee exists. what is wrong here. Fix it and make sure that the Hashset only adds unique employees.

Q15) Write a program to Sort Java ArrayList in descending order using comparator.

Q16) Write a program to sort elements of Java Vector in ascending order using comparator