DATA STRUCTURES

BATCH – B
[THURSDAY FEBRUARY 23, 2017: 2:00 PM – 5:00 PM]

ASSIGNMENTS – 6 CODE: assign06

INSTRUCTIONS: [Total Marks: 30]

iv) Read all assignments and each problem has to be answered in the same c file.
v) Create a .c file following the file name convention: abc-assign06.c
Where abc is your roll number and assign06 is the assignment code
vi) Strictly follow the file name convention and do not use scanf()

PROBLEMS:

3) **[Marks: 4 marks]**
Define a TICKET using typedef with the following attributes:
PNR, Train Name, Date, Quota, Passenger Name, Age, Seat, Coach, Fare,

```
pnr         : <int>  (Unique number – PNR Number)
trainname   :  <char[50]> (Max size: 50 Characters – Train Name)
date        : <char[12]> (Date of the Journey)
quota       : <int> (0 – General Quota, 1 – Tatkal Quota, 2 – Ladies
                Quota, 3 – Senior Citizens Quota, 4 – Defense Quota)
pa-name     : <char[50]> (Passenger Name)
age         : <int> (Age of the Passenger:
                        < 18 – Childern;
                    18 – 59 – Adults;
                        > 59 – Senior Citizens)
seat        : <float> (Seat Number of the Passenger)
coach       : <char[2]> ( Coach ID)
fare        : <float> (Ticket Cost)
```

4) **[Marks: 26 marks]**
Using the above data structure and the given function prototypes,
Write your code for the following tasks:

g) **[Marks: 5 marks]**
Read data from the given file – ticketbookings.txt - that contains n (=15) train ticket bookings. Now populate the dataset using the linked list. Each line carries the details of a ticket booking and values of the attributes are delimited by a comma (,).

```
ITEM *genBookingDataset(FILE *fp);
```

This function should internally call the following function to insert an element into the dataset.

```
ITEM *insertItem(TICKET *ticket);
```

The pointer should always point to the first element.

You may have to parse the input and convert (typecast) it into specific data types. You may use atoi() and atof() functions for such conversions.

h) **[Marks: 2 marks]**
Write a function to **print** pnr, pa-name and price of each item:
void printBookings(TICKET *ticket);

i) **[Marks: 3 marks]**
Write a **recursive** function to search the passenger trains (Train name ends with "PAS" or "PASSENGER") and print their booking details.
void SearchBookingByTrainType(TICKET *ticket, char *train);

j) **[Marks: 4 marks]**
The actual fare is given in the above bookings. Write **a function to apply a concession to all bookings** in the following way:

Age Group : Concession in the actual fare

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age < 18	:	25%
age > 18 and age < 59	:	No Concession
age > 59	:	50%

Print the updated booking details one per line.

void UpdateFares(TICKET *ticket);

At the end, **print** the sum of the fares of all tickets

k) **[Marks: 6 marks]**

Write a **function to sort the bookings by the date** of journey (latest booking first – sort by year, month and then date)

ITEM *SortBookingsByDate(TICKET *ticket);

l) **[Marks: 6 marks]**

Write a **function to delete a booking by the** PNR of the ticket
void deleteTicketByPNR(TICKET *ticket, int PNR);

Note that you have to print the ticket details before deleting it.