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CS19001: Programming and Data Structures Laboratory
Assignment No. 7 (Structures)
Date: 27-October-2019

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Problem Statement:

In the city of Wonderland, Dodo runs a medicine store business. Due to increasing population in the Wonderland city and health-related issues, keeping track of medicine records manually is becoming impossible. Dodo requested the King-of-Hearts in Wonderland to find a programmer to automate this process. Now, King-of-Hearts needs your help to build a C-program to automatically maintain the medicine repository of the Wonderland Medical Store. This medicine store needs to build a repository for keeping medicine records and also track the medicines bought by customers, generate bills, and provide orders for refilling when required.

Your task is to develop such a C-program having the following details:

- Create a structure for keeping the following information details for each medicine –

    - an unique ID (string of maximum 10 characters) of the medicine,
    - the name (string of maximum 100 characters) of the medicine,
    - the maker (string of maximum 100 characters) of the medicine,
    - the manufacturing and expiry date (both in DD/MM/YYYY format) of the medicine,
    - the available quantity ($< 10^9$) of the medicine,
    - the price per quantity (a real number) of the medicine, and
    - the type (Liquid, Tablet, Capsule, Injection, Inhale, External) of the medicine.

    You may require to define an array of such structures to keep various medicine information in the store.

- Your program shall show a menu containing 5 options and shall ask user to enter one choice (a, b, c, d, e). Any other invalid choice will flag a warning to the user and allows them to re-enter their choice. The menu items and operations to be performed upon entering each of the choices are described below.

    (a) *Order/Refill Medicine.* Selecting this option will prompt the user to enter medicine details (medicine ID and name, manufacturer's name, manufacturing and expiry date, quantity, price per quantity, type). This will add as an entry in the array of structures storing the information of the medicine. Finally, it will again ask whether the user wants to add more medicine information in the repository, and 'y' has to be entered by the user in case of YES so that this operation is repeated. Otherwise, the original menu containing the 5 options will be displayed.

    (b) *Buy Medicine.* Selecting this option will prompt the user to enter the details of medicine (medicine name, quantity, and type). It will reduce the quantity of the bought medicine from the present availability, or fully delete the corresponding entry from the array of structures storing the information of the medicine when the all the remaining quantity of the medicine are bought by customer. Additionally, it will prompt 'Stock-Over' if the medicine remaining in the store is less than the buying quantity; and 'Not-Found' if the medicine name is not available in the store. Finally, it will again ask whether the user wants to buy more medicine, and 'y' has to be entered by the user in case of YES so that this operation is repeated. At the end, when user is done with all the medicines needed, a bill will be printed, each line containing all the medicine related details (medicine ID and name, manufacturer's name, type, manufacturing and expiry date, quantity, price per quantity) plus the total price for that medicine at the last column. Then, at the bottom, the total purchased medicine amount has to be displayed. Again, the original menu containing the 5 options will be displayed.

    (c) *In-store Medicine Statistics.* Selecting this option will provide the details for all the medicines available at that moment in the store. Each line will contain all the medicine related details and the total price at the last column. Then, at the bottom, the total in-store medicine amount has to be displayed. Again, the original menu containing the 5 options will be displayed.

    (d) *Discard Medicine.* Selecting this option will prompt the user to enter a medicine name and type, whose information needs to be deleted from the repository. If such a medicine is found, then the corresponding structure information is deleted and the array is shrunk (the next entries in the array are iteratively pushed earlier in the vacant index) and the total medicine counter is reduced. A 'Not-Found' message is displayed, if the medicine name is not available in the store. Finally, it will again ask whether the user wants to discard more medicines from the repository, and 'y' has to be entered by the user in case of YES. Again, the original menu containing the 5 options will be displayed.

    (e) *Exit.* Selecting this option will terminate the program with a 'Good-Bye' message.

Example Inputs/Outputs:

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===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: a
++ Enter Medicine Details ++
        -- Enter Medicine ID: 11AA12B65
        -- Enter Medicine Name: Rantac
        -- Enter Medicine Maker's Name: Zantac
        -- Enter Manufacturing Date (in DD/MM/YYYY Format): 27/11/2018
        -- Enter Expiry Date (in DD/MM/YYYY Format): 26/11/2020
        -- Enter Quantity (Number of Medicines): 100
        -- Enter Price Per Quantity (in INR): 1.24
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 1
Want to Add more Medicine in Wonderland-Store? (Type 'y' for YES)? y
++ Enter Medicine Details ++
        -- Enter Medicine ID: 11AC17E86
        -- Enter Medicine Name: Becosule
        -- Enter Medicine Maker's Name: Pfizer
        -- Enter Manufacturing Date (in DD/MM/YYYY Format): 18/04/2019
        -- Enter Expiry Date (in DD/MM/YYYY Format): 17/04/2022
        -- Enter Quantity (Number of Medicines): 150
        -- Enter Price Per Quantity (in INR): 15.94
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 2
Want to Add more Medicine in Wonderland-Store? (Type 'y' for YES)? y
++ Enter Medicine Details ++
        -- Enter Medicine ID: 11CD19S35
        -- Enter Medicine Name: Carmozyme
        -- Enter Medicine Maker's Name: Mendine
        -- Enter Manufacturing Date (in DD/MM/YYYY Format): 01/01/2019
        -- Enter Expiry Date (in DD/MM/YYYY Format): 31/12/2021
        -- Enter Quantity (Number of Medicines): 10
        -- Enter Price Per Quantity (in INR): 115
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 0
Want to Add more Medicine in Wonderland-Store? (Type 'y' for YES)? y
++ Enter Medicine Details ++
        -- Enter Medicine ID: 11FW28T20
        -- Enter Medicine Name: Seroflo
        -- Enter Medicine Maker's Name: CiplaMed
        -- Enter Manufacturing Date (in DD/MM/YYYY Format): 21/02/2019
        -- Enter Expiry Date (in DD/MM/YYYY Format): 20/02/2021
        -- Enter Quantity (Number of Medicines): 20
        -- Enter Price Per Quantity (in INR): 168
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 4
Want to Add more Medicine in Wonderland-Store? (Type 'y' for YES)? n

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: c

++ In-store Medicine Statistics ++
ID         Name       Maker      Type       ManufactureDate     ExpiryDate      Quantity      UnitPrice      TotalPrice
11AA12B65 Rantac      Zantac     Tablet     27/11/2018          26/11/2020      100           1.240000       124.000000
11AC17E86 Becosule    Pfizer     Capsule    18/04/2019          17/04/2022      150           15.940000      2391.000000
11CD19S35 Carmozyme   Mendine    Liquid     01/01/2019          31/12/2021      10            115.000000     1150.000000
11FW28T20 Seroflo     CiplaMed   Inhale     21/02/2019          20/02/2021      20            168.000000     3360.000000

Total In-store Medicine Amount = 7025.000000

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: b
        -- Enter Medicine Name: Carmozyme
        -- Enter Quantity (Number of Medicines to Buy): 2
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 0
Want to Buy more Medicine in Wonderland-Store? (Type 'y' for YES)? y
        -- Enter Medicine Name: Rantac
        -- Enter Quantity (Number of Medicines to Buy): 10
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 1
Want to Buy more Medicine in Wonderland-Store? (Type 'y' for YES)? n

++ Purchased Medicine Bill ++
ID         Name       Maker      Type       ManufactureDate     ExpiryDate      Quantity      UnitPrice      TotalPrice
11CD19S35 Carmozyme   Mendine    Liquid     01/01/2019          31/12/2021      2             115.000000     230.000000
11AA12B65 Rantac      Zantac     Tablet     27/11/2018          26/11/2020      10            1.240000       12.400000

Total Purchased Medicine Amount = 242.400000

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
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        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: c

++ In-store Medicine Statistics ++
ID        Name       Maker      Type      ManufactureDate     ExpiryDate      Quantity      UnitPrice      TotalPrice
11AA12B65 Rantac     Zantac     Tablet    27/11/2018          26/11/2020      90            1.240000       111.600000
11AC17E86 Becosule   Pfizer     Capsule   18/04/2019          17/04/2022      150           15.940000      2391.000000
11CD19S35 Carmozyme  Mendine    Liquid    01/01/2019          31/12/2021      8             115.000000     920.000000
11FW28T20 Seroflo    CiplaMed   Inhale    21/02/2019          20/02/2021      20            168.000000     3360.000000

Total In-store Medicine Amount = 6782.600000

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: d

++ Discarding Specified Medicines ++
Want to Discard specific Medicines from Wonderland-Store? (Type 'y' for YES)? y
        -- Enter Medicine Name: Becosule
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 2
Want to Discard specific Medicines from Wonderland-Store? (Type 'y' for YES)? n

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: c

++ In-store Medicine Statistics ++
ID        Name       Maker      Type      ManufactureDate     ExpiryDate      Quantity      UnitPrice      TotalPrice
11AA12B65 Rantac     Zantac     Tablet    27/11/2018          26/11/2020      90            1.240000       111.600000
11CD19S35 Carmozyme  Mendine    Liquid    01/01/2019          31/12/2021      8             115.000000     920.000000
11FW28T20 Seroflo    CiplaMed   Inhale    21/02/2019          20/02/2021      20            168.000000     3360.000000

Total In-store Medicine Amount = 4391.600000

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: b
        -- Enter Medicine Name: Metrogyl
        -- Enter Quantity (Number of Medicines to Buy): 10
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 1
*** Not-Found: Specified Medicine not found in Store! ***
Want to Buy more Medicine in Wonderland-Store? (Type 'y' for YES)? y
        -- Enter Medicine Name: Rantac
        -- Enter Quantity (Number of Medicines to Buy): 100
        -- Enter Medicine Type (0: Liquid, 1: Tablet, 2: Capsule, 3: Injection, 4: Inhale, 5: External): 1
*** Stock-Over: Specified Medicine Stock is Inadequate! ***
Want to Buy more Medicine in Wonderland-Store? (Type 'y' for YES)? n

++ Purchased Medicine Bill ++
ID        Name       Maker      Type      ManufactureDate     ExpiryDate      Quantity      UnitPrice      TotalPrice

Total Purchased Medicine Amount = 0.000000

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
(a) Order/Refill Medicine,
(b) Buy Medicine,
(c) In-store Medicine Statistics,
(d) Discard Medicines,
(e) Exit.
-- Enter a Choice: w
*** Warning: Wrong Choice Entered! Re-enter ... ***

===== !! Welcome to Wonderland Medical Store !! =====
-- Options:
        (a) Order/Refill Medicine,
        (b) Buy Medicine,
        (c) In-store Medicine Statistics,
        (d) Discard Medicines,
        (e) Exit.
-- Enter a Choice: e

===== !! Good-Bye ! Have a Nice Day !! =====
```

Submit a single C source file. Do not use global/static variables.