National University of Computer and Emerging Sciences

Laboratory Manual

for

Programming Fundamentals

(CS-188)

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Lab Manual

Objectives

The objectives of this lab are to cover the following:

1. Structures
2. Union

Problem 1: Write a program to compare two dates entered by user. Make a structure named **Date** to store the elements day, month and year to store the dates. If the dates are equal, display "Dates are equal" otherwise display "Dates are not equal".

Sample Input

First Date: 31 May 2021

Second Date: 1 June 2021

Sample Output

Dates are not equal

Problem 2: Make an array of structure that stores detail of students i-e Student Name, Roll No and Marks and display the detail of all students.

Sample Input

Enter Data of 1st Student

Name: Jam
Roll No: 12

Marks: 88

Enter Data 2nd Student

Name: Tom

Roll No: 126

Marks: 80

Sample Output

Student 1

Name: Jam

Roll No: 124

Marks: 88

Student 2

Name: Tom

Roll No: 126

Marks: 80

Problem 3: Define a struct item, with two components: name and price of the item. Write a program to help FAST-NUCES restaurant automate its breakfast billing system. The Program should do the following:

Show the customer different breakfast items offered by the restaurant. Assume the restaurant offers the following breakfast items (the price of each item is shown to the right of the item):

- Bacon and Egg $2.45
- French Toast $1.99
- Fruit Basket $2.49
- Cereal $0.69
- Coffee $0.50
- Peanut butter: $0.80

You can make menu of your own choice but menu should has at least 10 items. Allow the customer to select more than one item from the menu. Calculate and print the bill.

Your Program must contain atleast the following functions:

1) **Getdata :** This function loads the data into array menuList and number of items may vary.
2) **Show Menu:** This function shows the different items offered by the restaurant and tells the user to select the items
3) **Print Check:** This function calculate and prints the check.

(Note that the billing amount should include a 5% sales tax.)The customer can

select multiple items of particular type.

Sample Output

```
                    Welcome to the FAST'S Cafe
-----------Today's Menu-----------
 1: Egg (cooked to order)    $1.99
 2: Golden-Brown Pancake    $1.99
 3: French Toast              $2.99
 4: Muffin                    $0.99
 5: Bagel w/ Spread          $1.20
 6: Fresh Fruit               $3.49
 7: Steel-Cut Irish Oatmeal   $4.69
 8: Coffee                   $1.50
 9: Pot of Assorted Tea      $1.75
10: Hot Chocolate            $1.75

Do you want to place an order? (y/n): y

Enter item number: 12

Enter item number between 1 and 10: 1

Enter item quantity: 12

Select another item? (y/n): y

Enter item number: 3

Enter item quantity: 1
```

```
Select another item? (y/n): y

Enter item number: 7

Enter item quantity: 20

Select another item? (y/n): y

Enter item number: 10

Enter item quantity: 2

Select another item? (y/n): n

  Thank you for eating at  the FAST`S Cafe
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Receipt              Qty    Amount
-----------------------------------
Egg (cooked to order)    12   $23.88
French Toast              1     $2.99
Steel-Cut Irish Oatmeal  20    $ 93.80
Hot Chocolate            2       $3.50
Tax                              $ 8.69
 Amount Due                  $132.86
```

Problem 4: Consider a store that has two items:

- Books
- Shirts

Store owners want to store the records of the above-mentioned two items along with the relevant information. For example, Books include Title, Author, no of pages, price, and Shirts include Color, design, size, and price. The 'price' property is common in both items. The Store owner wants to store the properties.

Initially, store owner decided to store the records in a structure. The designed structure is completely usable but the price is common property in both the items and the rest of the items are individual. For example, the properties for books may be like price, title, author, and number_pages while color, size, design may be use for Shirt. Write a c++ program to show that above approach of store owner for storing records by struct is wastage of memory and lots of space can be saved using unions.

(Hint: You may use function sizeof())