# CS 1101   A-Term 2021                    Professor Engling

# Homework 3 - Writing functions for Lists of Structs (190 Points)

## Due: Tuesday,  September 21 at 11:00 pm

Read the Expectations on Homework posted on Canvas.

## Assignment Goals

- To be able to define a list of structures
- To make sure you can write functions for lists of structs

## The Assignment:  Data Definitions and Functions for Lists of Structs

The wait staff in a local restaurant use hand-held devices to record customers' orders. In the following problems, you will write data definitions and functions that model the ordering of items from the restaurant's menu.

1. **(20 Points)**  Each item on the menu consists of the **name** of the item, the **kind** (appetizer, entree, dessert, or beverage), whether or not the item is **vegetarian?**, the **quantity** of the items ordered, and the **cost** of a single item. Provide a data definition for **Menu-item** that represents the given information.

   Give at least 3 examples of menu items.

2. **(5 Points)**  Write the template for functions over menu-items.

3. **(10 Points)**  Define an **Order** (a ListOfMenu-item).
   Give at least two examples of orders.
   Your lists should contain more than a single menu item.

4. **(5 Points)**  Write the template for functions over an order (a ListOfMenu-item).

5.  **(30 Points)**  Develop the function *count-appetizers*, that consumes an order and returns the number of items in the order that are appetizers. (Here the quantity of each appetizer in the list is **not** taken into account by this function - the function simply counts each menu item in the list that is classified as an appetizer.)

6.  **(30 Points)**  Develop a function *list-expensive-vegetarian* that consumes an order and a number and produces an order. The order that is produced contains only those items from the original order that are vegetarian and that cost more than an amount given.

7.  **(30 Points)**  Develop a function *order-total*. The function consumes an order and produces the total cost of the order (a number). When calculating the total cost, you must take into account the quantity of each item ordered.

8.  **(30 Points)**  Develop a function *beverage-total* that consumes an order and produces a number. The function calculates the cost of all beverages in the order (again, take quantities into account).

9.  **(30 Points)**  Develop a function called *cost-with-tip*. The function consumes an order and a number representing the percent of the tip. The function produces the total cost of the order with the tip. When calculating the cost, the tip is applied only to non-beverage items.

# What to Turn In

The rubric the graders will use for Homework 3 is posted below this assignment on Canvas. Programs must run in order to receive credit.

Note that code that is commented out will not be graded.

Using Canvas, turn in a single file containing all code and documentation for this assignment.

Name your file according to the naming conventions posts in the Assignments block on Canvas.

Make sure your name(s) and login(s)--for both partners, if applicable--appear at the top of the file in a comment.