# Web Development – Mr. Turner

# Project – McDougal's Burgers and Stuff

**Project Overview**

It is your exciting first day as a programmer for the McDougal's and Stuff fast “food” chain restaurant. You have been tasked with writing some software that can track sales on a register. In order to test your software, you'll program a simulation that runs through an average cashier's shift. Throughout the course of that shift, customers will come in and order items off the menu. As the cashier, it's your simulation's job to take the orders, take the money from the customer, and give the proper change. At the end of the shift, the computer will determine whether or not your register is complete.

**Display**

The list below includes the essential elements of the page.

- A log of customer receipts, including:
  - Each item ordered
  - The individual price of the item
  - The sub total
  - The tax
  - The total
  - The method of payment
  - The payment
  - The change.
- The results of the simulation in a separate section including:
  - The total number of sales
  - The total amount in cash sales
  - The total amount in electronic sales
  - The balance of the register (whether or not it was over or under or even).
  - The total sales, in quantity and dollars, for each item.

**Functionality**

The user's register begins with $100 in the following denominations:

- 100 pennies
- 40 nickels
- 50 dimes
- 40 quarters
- 42 one dollar bills
- 4 five dollar bills

- 2 ten dollar bills

Throughout the course of the simulation, you will need to keep track of the exact numbers of each bill and coin in the register so that you can balance at the end.

At the start of the simulation, the cashier is beginning a 3 hour shift. There is no actual clock or timing of the simulation. The simulation will keep track of time in terms of customers.

As soon as the shift begins, a customer will come up to the register and place an order. It will take 1 to 5 minutes (determined randomly) to serve that customer. After the customer has ordered and paid, there will be a 0 to 2 minute break until the next customer arrives.

A customer will make an order based on the following guidelines:

The customer will order 0 or 1 random entrée.
The customer will order 0, 1, or 2 random side dishes.
The customer will order 0 or 1 random dessert.
The customer will order 1 random drink.

The entrees are:

- Hambuger $1.99
- Chicken Sandwich $1.99
- Veggie Sandwich $2.29

The sides are:

- French Fries $.99
- Salad $1.39
- Cheese Sticks $1.49
- Rice $1.19

The desserts are:

- Ice Cream $1.89
- Pie $1.69
- Cookie $.89

The drinks are:

- Soda $1.19
- Bottled Water $1.25
- Juice $1.69

Once the order has been made, the totals will be calculated and the customer must pay.

- The subtotal is the sum of all of the items.
- Tax is 8.875%. Multiply the subtotal by .08875 in order to figure out the tax on the order.

- The total is the subtotal plus the tax.

Determine the method of payment at random.

- The customer may pay cash (40% chance).
- The customer may pay electronically (60% chance).

If the customer pays electronically, it is automatically exact change. Keep a running total of the electronic payments.

If the customer pays cash, there is a 10% chance that payment will be in exact change. If that is the case, it's up to the simulation to figure out the denominations or the coins and bills.

If the customer does not have exact change, the simulation will figure out what kind of money it's carrying.

- 0 - 5 one dollar bills.
- 0 - 3 five dollar bills.
- 0 - 2 ten dollar bills.
- 1 twenty dollar bill.

The customer will try to pay with the smallest denominations first. Once payment is made, the cashier will give change. Remember to keep track of the bills and coins moving in and out of the register.

It is possible that the cashier will not be able to make change. If that is the case, it needs to round up to the nearest denomination it *does* have *unless* the difference is less than 5 cents. In that case, the cashier will short change the customer.

At the end of the shift, the will show the results of the 3 hour shift.

- The total number of sales
- The total amount in cash sales
- The total amount in electronic sales
- The balance of the register (whether or not it was over or under or even).
    - A register is balanced if the amount of money in it is equal to the total cash sales plus the original $100.
- The total sales, in quantity and dollars, for each item.

**<u>Enhancements</u>**

- Coin and bill drops
    - If the cashier runs low on a particular denomination, it can drop larger bills for lower bills and coins.
    - A roll of pennies is 50 cents.
    - A roll of nickels is $2.
    - A roll of dimes is $5.
    - A roll of quarters is $10.

- Allow the user to run the simulation multiple times.  Keep the totals for each shift and determine averages over the course of several shifts.