ASSIGNMENT

Q1. Create a struct called Invoice that a hardware store might use to represent an invoice for an item sold at the store. An Invoice should include four data members—a part number (type string), a part description (type string), a quantity of the item being purchased (type int) and a price per item (type float). Your program should initialize the four data members. In addition, it should calculate the invoice amount (i.e., multiplies the quantity by the price per item), If the quantity is not positive, it should be set to 0. If the price per item is not positive, it should be set to 0. Write a test program that demonstrates struct Invoice's capabilities.

Note: Perform this work using

1. 2d array

2. pointer to 2d arrays

3. design function for calculating the results by passing array to function by value and by reference.

Q2. The results from the mayor's race have been reported by each precinct as follows:

Precinct	Candidate A	Candidate B	Candidate C	Candidate D
1	192	48	206	37
2	147	90	312	21
3	186	12	121	38
4	114	21	408	39
5	267	13	382	29

Write a program to do the following:

a) Display the table with appropriate labels for the rows and columns.

b) Compute and display the total number of votes received by each candidate and the percentage of the total votes cast.

c) If any one candidate received over 50 percent of the votes, the program should display a message declaring that candidate the winner.

d) If no candidate received 50 percent of the votes, the program should display a message declaring a runoff between the two candidates receiving the highest number of votes; the

two candidates should be identified by their letter names.(e.g. candidates 'A' and 'C' received highest votes)

e) Run the program once with the data shown and once with candidate C receiving only 108 votes in Precinct 4.

Q3. Use matrix subtraction to calculate how much longer was the life expectancy of black and white women than men of the same races in each decade from year 1950 to year 2000. There is no need to store the year data in your matrices—just provide the years in the output.

a) Input each matrix from user

b) Calculate the matrix difference by calling a function you write called matrix_diff that will subtract any two 6-by-2 matrices, producing a third 6-by-2 matrix.

c) Display all three matrices with appropriate labels. Your function should calculate the matrix difference by subtracting each element of the second matrix from the corresponding element of the first.

United States Life Expectancy at Birth by Sex and Race

Female			Male		
Year	**Black**	**White**	**Year**	**Black**	**White**
1950	62.9	72.2	**1950**	59.1	66.5
1960	66.3	74.1	**1960**	61.1	67.4
1970	68.3	75.6	**1970**	60.0	68.0
1980	72.5	78.1	**1980**	63.8	70.7
1990	73.6	79.4	**1990**	64.5	72.7
2000	75.2	80.1	**2000**	68.3	74.9

Q4. Write a program to obtain transpose of a 4 x 4 matrix. The transpose of a matrix is obtained by exchanging the elements of each row with the elements of the corresponding column.

Q5. Write a program to multiply any two 3 x 3 matrices.