Question 1:

Write a program that prompts the user to input a string. The program then uses the function *substr* to remove all the vowels from the string. For example, if str = "There", then after removing all the vowels, str = "Thr". After removing all the vowels, output the string. Your program must contain a function to remove all the vowels and a function to determine whether a character is a vowel.

Question 2:

Write a program that can be used to calculate the federal tax. The tax is calculated as follows:

For single people, the standard exemption is $4,000; for married people, the standard exemption is $7,000. A person can also put up to 6% of his or her gross income in a pension plan. The tax rates are as follows: If the taxable income is:
• Between $0 and $15,000, the tax rate is 15%.
• Between $15,001 and $40,000, the tax is $2,250 plus 25% of the taxable income over $15,000.
• Over $40,000, the tax is $8,460 plus 35% of the taxable income over $40,000.

Prompt the user to enter the following information:
• Marital status
• If the marital status is ‘‘married,’’ ask for the number of children under the age of 14
• Gross salary (If the marital status is ‘‘married’’ and both spouses have income, enter the combined salary.)
• Percentage of gross income contributed to a pension fund

Your program must consist of at least the following functions:

a. Function getData: This function asks the user to enter the relevant data.
b. Function taxAmount: This function computes and returns the tax owed.

Question 3:

Write a program that calculates and prints the monthly paycheck for an employee. The net pay is calculated after taking the following deductions:

Federal Income Tax: 15%
State Tax: 3.5%
Social Security Tax: 5.75%
Medicare/Medicaid Tax: 2.75%
Pension Plan: 5%
Health Insurance: $75.00

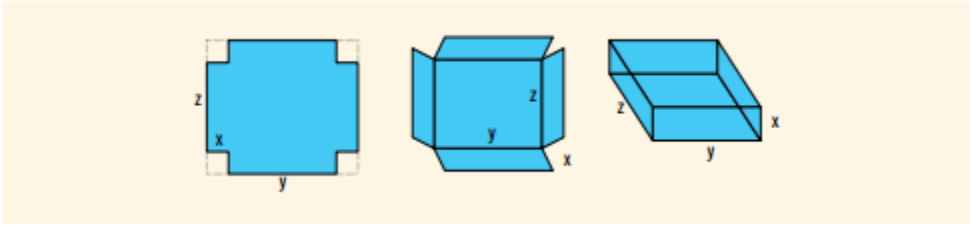
Your program should prompt the user to input the gross amount and the employee name. The output will be stored in a file. Format your output to have two decimal places. A sample output follows:

Bill Robinso

Gross Amount: $3575.00
Federal Tax: ..... $ 536.25
State Tax: ..... $ 125.13
Social Security Tax: ..... $ 205.56
Medicare/Medicaid Tax: $ 98.31
Pension Plan: ..... $ 178.75
Health Insurance: .....$ 75.00
Net Pay: $2356.00

Note that the first column is left-justified, and the right column is right justified.

Question 4:
(The box problem) You have been given a flat cardboard of area, say, 70 square inches to make an open box by cutting a square from each corner and folding the sides (see given figure). Your objective is to determine the dimensions, that is, the length and width, and the side of the square to be cut from the corners so that the resulting box is of maximum length.



Write a program that prompts the user to enter the area of the flat cardboard. The program then outputs the length and width of the cardboard and the length of the side of the square to be cut from the corner so that the resulting box is of maximum volume. Calculate your answer to three decimal places.

Your program must contain a function that takes as input the length and width of the cardboard and returns the side of the square that should be cut to maximize the volume. The function also returns the maximum volume.

Question 5:

Write a program to convert the time from 24-hour notation to 12-hour notation and vice versa. Your program must be menu driven, giving the user the choice of converting the time between the two notations. Furthermore, your program must contain at least the following functions: a function to convert the time from 24-hour notation to 12-hour notation, a function to convert the time from 12-hour notation to 24-hour notation, a function to display the choices, function(s) to get the input, and function(s) to display the results. (For 12-hour time notation, your program must display AM or PM.)