**LAB 05: EXERCISE**

1. Write a C program that takes a value from user and store in variable num1. Test the value of num1, if the value of num1 is 5,6,7,8 square num1. If it is 9, read a new value into num1. If it is 2 or 3, multiply num1 by 99 and print out the result. Implement your code using nested if statement.
2. A manufacturer would like to have a device for a car that will turn on a light when the temperature is between 34 and 40 degrees Fahrenheit (F) and sound a warning signal when the outside temperature is 34 degrees F or below. The light and the sound are never going simultaneously. Write a solution to this problem.
3. The Last Stop Boutique is having a five-day sale. Each day, starting on Monday, the price will drop 10% of the previous day’s price. For example, if the original price of a product is $20.00, the sale price on Monday would be $18.00 (10% less than the original price). On Tuesday the sale price would be $16.20 (10% less than Monday). On Wednesday the sale price would be $14.58; on Thursday the sale price would be $13.12; and on Friday the sale price would be $11.81. Write a program that will calculate the price of an item for each of the five days, given the original price. **Test the solution for an item costing $10.00.**
4. Write a program to test whether a given number is prime or not.
5. Collecting money becomes increasingly difficult during periods of recession, so companies may tighten their credit limits to prevent their accounts receivable (money owed to them) from becoming too large. In response to a prolonged recession, one company has cut its customers’ credit limits in half. Thus, if a particular customer had a credit limit of $2000, it’s now $1000. If a customer had a credit limit of $5000, it’s now $2500. Write a program that analyzes the credit status of three customers of this company. For each customer you’re given:

a) The customer’s account number

b) The customer’s credit limit before the recession

c) The customer’s current balance (i.e., the amount the customer owes the company).

Your program should calculate and print the new credit limit for each customer and should determine (and print) which customers have current balances that exceed their new credit limits.

1. Write a program that prints the following diamond shape. You may use printf statements that print either a single asterisk (\*) or a single blank. Maximize your use of repetition (with nested for statements) and minimize the number of printf statements



1. a. Write a program to process a collection of daily high temperatures. Your  
   program should count and print the number of hot days (high temperature 85 or higher), the number of pleasant days (high temperature 60–84), and the number of cold days (high temperatures less than 60). It should also display the category of each temperature. Test your program on the following data:

**55 62 68 74 59 45 41 58 60 67 65 78 82 88 91 92 90 93 87 80 78 79 72 68 61 59**

b. Modify your program to display the average temperature (a real number)  
at the end of the run.

1. Mary Smith, a student, has borrowed $3,000 to help pay her college expenses. After  
   setting up a budget, $85 was the maximum monthly payment she could afford to  
   make on the loan. Develop a solution to calculate and print the interest, the principal, and the balance on the loan per month. Other information she would like to  
   know is the number of years and months it will take to pay the loan back and the  
   total interest she will pay during that period. The interest rate is 1% per month on  
   the unpaid balance. Keep in mind these formulas:

Interest normal = balance\*interest rat

Payment = balance – interest

New balance = balance - payment