1. **(Sales-Commission Calculator)** One large chemical company pays its salespeople on a commission basis. The salespeople receive $200 per week plus 9% of their gross sales for that week. For example, a salesperson who sells $5000 worth of chemicals in a week receives $200 plus 9% of $5000, or a total of $650. Develop a program that will input each salesperson’s gross sales for last week and will calculate and display that salesperson’s earnings. Process one salesperson’s figures at a time. Here is a sample input/output dialogs:

Enter sales in dollars (-1 to end): 5000.00

Salary is: $650.00

Enter sales in dollars (-1 to end): 1234.56

Salary is: $311.11

Enter sales in dollars (-1 to end): -1

1. **(Salary Calculator)** Develop a program that will determine the gross pay for each of several employees. The company pays "straight time" for the first 40 hours worked by each employee and "time-and-a-half" for all hours worked in excess of 40 hours. You're given a list of the employees of the company, the number of hours each employee worked last week and the hourly rate of each employee. Your program should input this information for each employee, and should determine and display the employee's gross pay. Here is a sample input/output dialog:

Enter # of hours worked (-1 to end): 39

Enter hourly rate of the worker ($00.00): 10.0

Salary is $390.00

Enter # of hours worked (-1 to end): 40

Enter hourly rate of the worker ($00.00): 10.0

Salary is $400.00

Enter # of hours worked (-1 to end): 41

Enter hourly rate of the worker ($00.00): 10.0

Salary is $415.00

Enter # of hours worked (-1 to end): -1

1. **(Checking if a Number is Prime)** A prime number is any natural number greater than 1 that is divisible only by 1 and by itself. Write a C program that reads an integer and determines whether it is a prime number or not.
2. **(Armstrong Numbers)** Armstrong numbers are numbers that are equal to the sum of their digits raised to power of the number of digits in them. The number 153, for example, equals . Thus it is an Armstrong number. Write a program to display all three-digit Armstrong numbers.
3. **(Sides of a Triangle)** Write a program that reads three nonzero integer values and determines and prints whether they could represent the sides of a triangle.
4. **(Enforcing Privacy with Cryptography)** A company that wants to send data over the Internet has asked you to write a program that will encrypt it so that it may be transmitted more securely. All the data is transmitted as four-digit integers. Your application should read a four-digit integer entered by the user and encrypt it as follows: Replace each digit with the result of adding 7 to the digit and getting the remainder after dividing the new value by 10. Then swap the first digit with the third, and swap the second digit with the fourth. Then print the encrypted integer.
5. Write an application that inputs an encrypted four-digit integer generated by the encrypting algorithm in Problem 6 and decrypts it (by reversing the encryption scheme) to form the original number.
6. Zeller’s congruence is an algorithm developed by Christian Zeller to calculate the day of the week. The formula is

where

* *h* is the day of the week (0: Saturday, 1:Sunday, 2:Monday, 3:Tuesday, 4:Wednesday, 5:Thursday, and 6:Friday).
* *q* is the day of the month
* *m* is the month (3:March, 4:April, …, 12:December). January and February are counted as months 13 and 14 of the previous year.
* *j* is .
* *k* is the year of the century (i.e., year % 100).

Note all divisions in this problem perfrom an integer division. Write a program that prompts the user to enter a year, month, and day of the month, and display the name of the day of the week.

[Hint: January and February are counted as 13 and 14 in the formula, so you need to convert the user input 1 to 13 and 2 to 14 for the month and change the year to the previous year. For example, if the user enters 1 for m and 2015 for year, m will be 13 and year will be 2014 used in the formula.]

Here are some sample runs:

Enter year: 2015

Enter month (1-12): 1

Enter the day of the month (1-31): 25

Day of the week is Sunday

Enter year: 2012

Enter month (1-12): 5

Enter the day of the month (1-31): 12

Day of the week is Saturday