# Home Work 1 CS5008

## Exercise 1

Dairy Farm decided to ship milk in containers in the form of cubes rather than cylinders. Write a program that prompts the user to input the radius of the base and the height of a cylindrical container and outputs the side of the cube with the same volume as the cylindrical container.

## Exercise 2

Paula and Danny want to plant evergreen trees along the back side of their yard. They do not want to have an excessive number of trees. Write a program that prompts the user to input the following:

a. The length of the yard.
b. The radius of a fully grown tree.
c. The required space between fully grown trees.

The program outputs the number of trees that can be planted in the yard and the total space that will be occupied by the fully grown trees.

## Exercise 3:

The population of a town A is less than the population of town B. However, the population of town A is growing faster than the population of town B. Write a program that prompts the user to enter the population and growth rate of each town. The program outputs after how many years the population of town A will be greater than or equal to the population of town B and the populations of both the towns at that time. (A sample input is: Population of town A ¼ 5000, growth rate of town A ¼ 4%, population of town B ¼ 8000, and growth rate of town B ¼ 2%.)

## Exercise 4:

The first 11 prime integers are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, and 31. A positive integer between 1 and 1000 (inclusive), other than the first 11 prime integers, is prime if it is not divisible by 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, and 31. Write a program that prompts the user to enter a positive integer between 1 and 1000 (inclusive) and that outputs whether the number is prime. If the number is not prime, then output all the numbers,

from the list of the first 11 prime integers, which divide the number.

**Exercise 5:**

A new author is in the process of negotiating a contract for a new romance novel. The publisher is offering three options. In the first option, the author is paid $5,000 upon delivery of the final manuscript and $20,000 when the novel is published. In the second option, the author is paid 12.5% of the net price of the novel for each copy of the novel sold. In the third option, the author is paid 10% of the net price for the first 4000 copies sold, and 14% of the net price for the copies sold over 4000. The author has some idea about the number of copies that will be sold and would like to have an estimate of the royalties generated under each option. Write a program that prompts the author to enter the net price of each copy of the novel and the estimated number of copies that will be sold. The program then outputs the royalties under each option and the best option the author could choose. (Use appropriate named constants to store the special values such as royalties rates and fixed royalties.)