Q1.

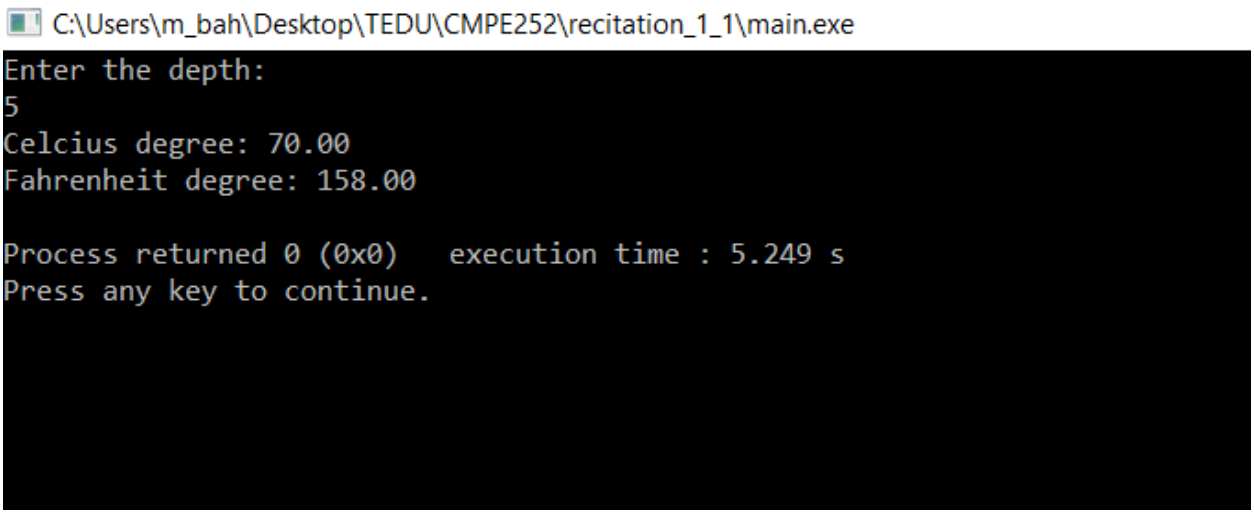
Write a program to take a depth (in kilometers) inside the earth as input data; compute and display the temperature at this depth in degrees Celsius and degrees Fahrenheit. The relevant formulas are

Celsius = 10 * depth + 20

Fahrenheit = 1.8 * Celsius + 32

Include two functions in your program. Function `celsius_at_depth` should compute and return the Celsius temperature at a depth measured in kilometers. Function `fahrenheit` should convert a Celsius temperature to Fahrenheit.

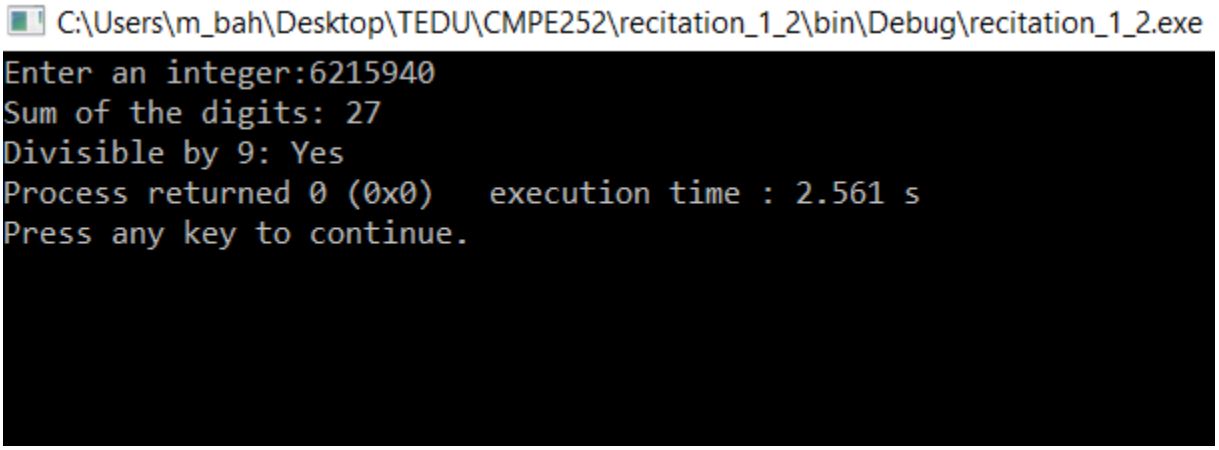
Sample run:



Q2.

An integer n is divisible by 9 if the sum of its digits is divisible by 9. Develop a program which takes an integer number and displays sum of its digits. Your program should also determine whether or not the number is divisible by 9 by checking whether the sum of digits is divisible by 9.

Sample run:



Test it on the following numbers:

N = 154368

N = 6215940

N = 12345

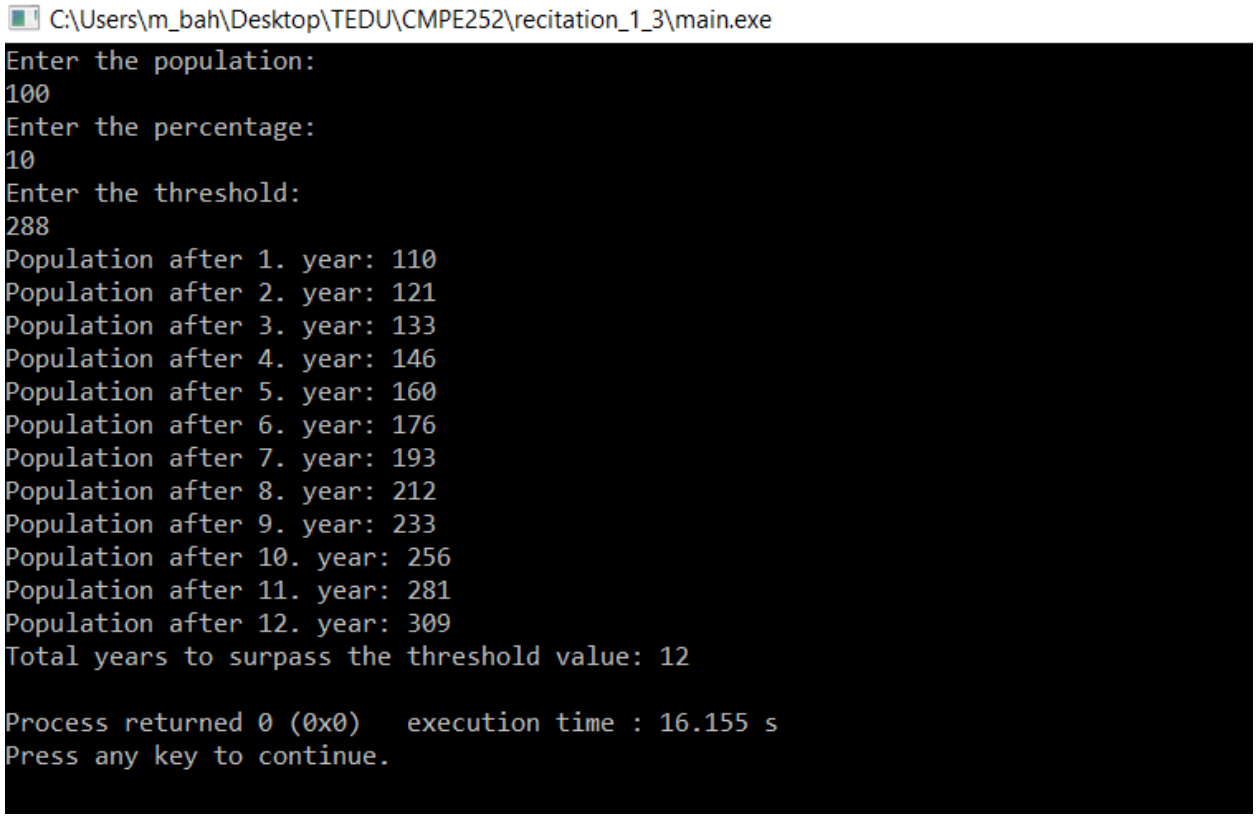
Q3.

Write a program which takes three numbers:

- the number of people in a town
- the percentage by which the population increases each year
- a threshold value

Write a loop that displays the annual population and determines how many years it will take for the population to surpass the threshold value. Use round function from math.h library to find the population after each year.

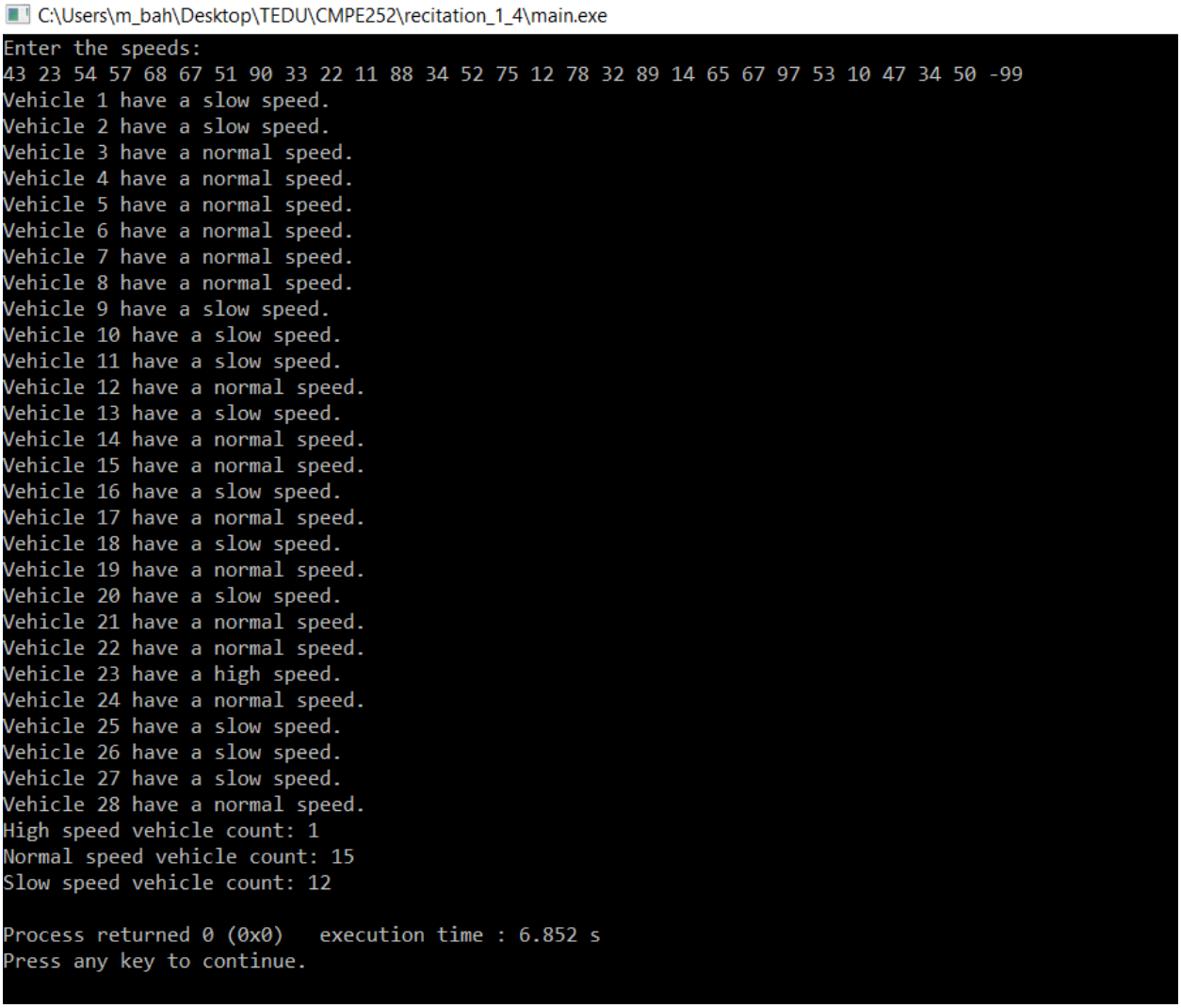
Sample run:



Q4.

Write a program to process a collection of the speeds of vehicles. Your program should count and print the number of vehicles moving at a high speed (higher than 90 miles/hour), the number of vehicles moving at a medium speed (50-90 miles/hour), and the number of vehicles moving at a slow speed (less than 50 miles/hour). It should also display the category of each vehicle. The end of the input is indicated by the sentinel value -99.

Sample run:



Q5.

Fibonacci numbers (0 1 1 2 3 5 8 13 …) are defined as follows:

0^{th} Fibonacci number is 0.

1^{st} Fibonacci number is 1.

n^{th} Fibonacci number (where n > 1) is the sum of $(n-1)^{th}$ Fibonacci number and $(n-2)^{th}$ Fibonacci number.

Write a function which takes an integer n and returns n^{th} Fibonacci number. Provide an iterative solution.

Sample run: