

Exercise 1

Write a program that generates two random number between 0 and 999 and asks the user for the result of adding the two numbers. If the answer is correct then it should congratulate the user, otherwise it should ask the user to try again.

Exercise 2

Create a program that reads integers from the user until a 0 is entered. Once all of the integers have been read your program should display all of the positive numbers, followed by all of the negative numbers. Your program should display each value on its own line.

Exercise 3

A particular zoo determines the price of admission based on the age of the guest. Guests 2 years of age and less are admitted without charge. Children between 3 and 12 years of age cost £14.00. Seniors aged 65 years and over cost £18.00. Admission for all other guests is £23.00.

Create a program that begins by reading the ages of all of the guests in a group from the user, with one age entered on each line. The user will enter a blank line to indicate that there are no more guests in the group. Then your program should display the admission cost for the group with an appropriate message. The cost should be displayed using two decimal places.

Exercise 4

One of the first known examples of encryption was used by Julius Caesar. Caesar needed to provide written instructions to his generals, but he didn't want his enemies to learn his plans if the message slipped into their hands. As result, he developed what later became known as the Caesar Cipher.

The idea behind this cipher is simple (and as a result, it provides no protection against modern code breaking techniques). Each letter in the original message is shifted by 3 places. As a result, A becomes D, B becomes E, C becomes F, D becomes G, etc. The last three letters in the alphabet are wrapped around to the beginning: X becomes A, Y becomes B and Z becomes C. Non-letter characters are not modified by the cipher.

Write a program that implements a Caesar cipher. Allow the user to supply the message and the shift amount, and then display the shifted message. Ensure that your program encodes both uppercase and lowercase letters. Your program should also support negative shift values so that it can be used both to encode messages and decode messages.

Exercise 5

Write a program that reads the contents of a file called example, which contains the following two lines

This is line 1

This is line 2

And writes to it the additional 2 lines

This is line 3

This is line 4

Exercise 6

Write a program that calculates the speed of a car by asking for the distance and the time from the user. This program should take into account errors that might happen as a result of wrong inputs (arithmetic error, value error) and asks the user for the correct values.