



Algorithmic and Data Structures1 (ASD1)

Exercise Series N° 5

Exercises

Tutorials	- Write an algorithm that asks for a starting number A and displays the next n numbers (n entered by the user). For example, if the user enters the number $a=35$, and $n=12$ the program will display the numbers from 35 to 46 - Write an algorithm that calculates the smallest common multiplier PPMC of two positive integers (without calculating the largest common divisor PGCD) - Write an algorithm that calculates the number of digits of an integer n. - Write an algorithm that allows you to enter positive and not zero, check if this integer is prime,. - Write a C program that calculates the sum $S = 1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} \dots \pm \frac{1}{n}$ (n entered by the user) - Write an algorithm that displays the number of divisors of each integer less than n
Practical Work	- Write a program that reads two integers and then displays the quotient of the first divided by the second, without using the division operator (/ or div). (Division is repeated subtraction). - Write a program that asks for a number between 10 and 20, until the answer matches. In the event of a response greater than 20, a message will appear: "Smaller! ", and conversely, "Bigger!" » if the number is less than 10. - write a program that reads a positive integer n then calculates the sum: $S = \frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \frac{4}{5} + \dots + \frac{n-2}{n-1} + \frac{n-1}{n}$ - Write an algorithm that prints a right isosceles triangle with right side length n (n entered by user) Example : $n=4$ <pre> * * * * * * * * * * </pre>
Additional Exercises	- Write an algorithm that displays all multipliers of 12 that are less than a given number n example if $n=100$ the algorithm displays : 12,24,36,48,68,72,84,96 - Write an algorithm that reads a letter and displays the next 5 letters in lexicographic order example : letter = 'd' → the 5 next letters : e , f , g , h , i - write an algorithm that displays the time every 10 minutes from a time entered by the user (the time is in hours and minutes) - Write an algorithm that calculates the following sum: $S = 1*2 + 2*3 + 3*4 + \dots + (n-1)*n$ - Write an algorithm that reads two positive integers a and b and constructs an integer C which is the concatenation of a and b Example $a=23, b=596 \rightarrow c= 23569$ - Write a program that reads a number and creates its mirror. Example $n=42781 \rightarrow \text{mirror} 18724$ - Write a program that reads a decimal number and gives its octal representation - Write an program that calculates the number of occurrences of a digit in a positive integer - Write a program that produces the following display: <pre> 1 22 333 4444 nnnn.....nnn </pre> - Write a program that produces the following display: <pre> a ab abc abcdef.....xyz </pre>