

# Fortran 95/2003 Course

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STEINBUCH CENTRE FOR COMPUTING - SCC



## Exercise 1.1

- Implement a program that reads a natural number  $n$  from STDIN and that prints out the sum of the first  $n$  natural numbers.

Hint:

- Reading of a variable from STDIN

```
READ *, <VARIABLE>
```

- Sum of the first  $n$  natural numbers

$$\sum_{i=1}^n i = \frac{n(n+1)}{2}$$

## Exercise 1.2

- Implement a program that reads two real numbers from STDIN.
  - Print out the sum, the difference, the product and the ratio of the two numbers.
  - Print out which number is greater or if both numbers are equal.
  - If both numbers are positive or if both numbers are negative, print out a corresponding message with the result

## Exercise 1.3

- Implement the Euclidean algorithm for the computation of the greatest common divisor (GCD) of two integer numbers  $m$  and  $n$ . Print out the GCD.

### Hint:

- Read two integer numbers from STDIN.
- Use an infinite DO-loop: Determine the remainder  $r$  of  $m/n$ . IF... THEN...ELSE-construct: If  $r$  is positive, compute the GCD of  $n$  and  $r$  in the next step. If  $r=0$ , the last divisor is the GCD of  $m$  and  $n$  (EXIT DO-loop).
- Remainder  $r$  of  $m/n$  by intrinsic function MOD:  $r = \text{MOD}(m, n)$

## Exercise 1.4

- Implement a program that reads many natural one-digit numbers. If a number has more than one digit, only the last digit should be taken. The reading stops if a negative number is read. Print out how often each digit occurred.

### Hint

- Define counters for each digit and initialize them to zero
- Use an infinite `DO`-loop and `EXIT`
- Use `MOD` to determine last digit of read number
- Use `SELECT CASE`-construct