Nim

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1 Exercises

Part I - Basic Syntax

In this part we'll go over basic programming syntax, like declaring variables, if clauses, loops and other key aspects of **Nim**. For the following problems, your program should ask the user for values.

1. Print a hello world.
2. Write a program that reads a value in ^{o}C and prints its value in ^{o}F. (F = 1.8C + 32)
3. Make an IMC calculator (Weight / (Height*Height)) and print the user category depending on the value.

IMC (kg/m²):	<18.5	[18.5, 25[	[25,30[	30 or more
Category	Underweight	Healthy	Overweight	Obese

4. Create a program that receives two numbers between between 0 and 100 and counts up or down until the first number is equal to the second or if it reaches either limit.

Part II - Procedures

Nim functions are called Procedures.

1. Start by creating procedures to solve exercises **3.** and **4.** from **Part I**.
2. Create a **max(x,y)** procedure that takes 2 values and returns the biggest.
3. Implement a **tax(r)** that implements the following:

$$tax(r) = \begin{cases} 0.1r & \text{if } r \leq 1000 \\ 0.2r - 100 & \text{if } 1000 < r \leq 2000 \\ 0.3r - 300 & \text{if } 2000 < r \end{cases}$$

Part III - Data Structures

Now that we can create variables let's go over some data structures and how to use them.

1. Write a procedure that works like **max()**, but takes a sequence as input.
2. Implement a program to count the frequency of words in a text (*Lorem Ipsum* text in appendix).

Part IV - Types

Write a program to represent a student record. Each student should have the following information:

1. Full Name
2. Student ID
3. Grades

Also create procedures:

1. **displayStudent** - to show information about a student.
2. **isPassing** - checks if certain student is passing the course (average above 9.5).

To test your program, use this code:

```
import strutils

# Your code here...


var
    students: array[3, Student]

# Input students
for i in 0 .. 2:
    echo "Enter details for Student ", i + 1
    echo "Full Name:"
    students[i].fullName = readLine(stdin)
    echo "Age:"
    students[i].age = parseInt(readLine(stdin))
    echo "Enter grades (separated by spaces):"
    let gradesInput = split(readLine(stdin))
    students[i].grades = @[]
    for grade in gradesInput:
        students[i].grades.add(parseFloat(grade))

# Display details of each student and if they're passing
for i in 0 .. 2:
    echo "\nDetails for Student ", i + 1
    displayStudent(students[i])
    echo "Passing Status:", isPassing(students[i])
    echo "----------------------"
```

2 Appendix

2.1 Lorem Ipsum

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