**LABORATORY 2**

**Exercise 2.2.1:**

fullTitle person = (if person.idDr then "Dr. " else "") ++ person.firstName ++ " " ++ person.lstName

Try to call the function with an argument such that "Dr. Haskell Curry" is displayed.

Text

Description automatically generated



**Exercise 2.3.1:** Call the fullName function using the User type constructor. Did you encounter any errors?

ANSWER: I encountered a lot of error before managing to write correctly… You can see below some of them:

Text

Description automatically generated

Text

Description automatically generated

**Question 2.3.1:** Does the way type alias works remind you of any keyword in C and C++?

ANSWER: This reminds me of typedef keyword which was also used to give a type a new name.

**Exercise 2.3.2:** Define a type alias Address, which includes 4 fields: street, number, city and country.

ANSWER: type alias Address = {street: String, number: Int, city: String, country: String}

**Exercise 2.3.3:** Write a function formatAddress , which takes an instance of an Address and displays itas street number, city, country.

Text

Description automatically generated

**Exercise 2.5.1:** Try to remove the last line ( \_ -> "Better luck next time" ) and check if the code could be compiled.

Text

Description automatically generated

ANSWER: We can’t compile without having a catch-all case in the case expression. ☹

**Exercise 2.5.2:** Try to swap the 1 -> "Gold" and \_ -> "Better luck next time" lines. Evaluate the following expressions in the REPL (numberToMedal 1), (numberToMedal 2), (numberToMedal 10).

Text

Description automatically generated

Each time I tried to run this module I got this error and, honestly, I can’t see where I’m wrong… Or maybe it’s the fact that the “\_“ case cannot be the first one, because it works well in the initial form.

**Question 2.7.1:** What is the cardinality of the Bool type?

ANSWER: The Bool type has 2 variants: True and False, so its cardinality is 2.

**Exercise 2.8.1:** Define a type for a dice which has six sides.

Text

Description automatically generated

**Exercise 2.8.2:** Define a type DicePair , which contains 2 Dice , in two ways, one using type aliases and one using type definitions.

> type Dice = One | Two | Three | Four | Five | Six

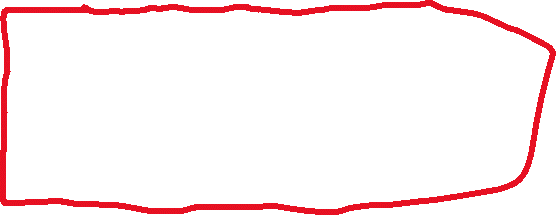
> type alias DicePair = {firstDice : Dice, secondDice : Dice}

> type DicePair = DicePair Dice Dice

**Exercise 2.8.3:** Write a function luckyRoll which takes a DicePair and returns a String. It should return “Very lucky” if the roll contains 2 sixes, “Lucky” it contains one six and “Meh” otherwise.

Text

Description automatically generated



**Exercise 2.8.4:** Write the function areaRec for ShapeRec

I used the function which implements Heron's formula for computing the area of a triangle knowing the edges from the laboratory notes.

Then I used case expression for computing the area depending on the type of shape: circle, rectangle or triangle.

Text

Description automatically generated

**Exercise 2.8.6:** Write a function validateCard : Date -> CreditCard -> Bool which checks if a credit card is valid.

1. Define the Date type, which stores the month and year until a card is valid.

2. Define the CardNumber type, which stores the 16 digits of the card as 2 Int s of 8 digits each. This is necessary because a 16 digit, positive integer can’t be stored in a 32 bit Int type.

3. Define the CreditCard type for a credit card which has:  an issuer (Visa or Mastercard)  a card number, which is of type CardNumber  an expiration date, which is of type Date 32

4. Write a function isDateAfter to check if the second date is after the first date.

5. Write a function isCardNumberValid to check if the credit card number is valid:

(a) To check that the whole number is valid, use the Luhn algorithm.

(b) If the INN (Issuer Identification Number) matches the card issuer:  Visa cards start with the digit 4  Mastercard cards have the first 4 digits between 2221 and 2720 or have the first 2 digits between 51 and 55

ANSWER: In the first screenshot there are the type declarations, as required in exercises 1,2,3.

Text

Description automatically generated

In the second picture there is the function isDateAfter required in exercise 4.

Text

Description automatically generated