

Homework 1
SNU 4190.310, Fall 2014
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Due: 9/22, 24:00

Exercise 1 “Sigma”

Define a function `sigma` that takes two integer bounds `a`, `b`, and the function `f` as arguments and returns a summation.

$$\sum_{n=a}^b f(n)$$

`sigma`'s type is

```
sigma : int * int * (int -> int) -> int.
```

so that, `sigma(a,b,f)` means $\sum_{n=a}^b f(n)$. \square

Exercise 2 “Sum and Product”

We can represent the propositional logic boolean formulas, `formula` as follows:

```
type formula = TRUE
              | FALSE
              | NOT of formula
              | ANDALSO of formula * formula
              | ORELSE of formula * formula
              | IMPLY of formula * formula
              | LESS of expr * expr
and  expr = NUM of int
```

```
| PLUS of expr * expr
| MINUS of expr * expr
```

Define a function `eval` that takes `formula` as an argument and returns true or false.

```
eval : formula → bool
```

□

Exercise 3 “Natural Numbers”

We can represent natural numbers, `nat` as follows:

```
type nat = ZERO | SUCC of nat
```

Define functions that adds and multiplies two natural numbers.

```
natadd : nat * nat -> nat
natmul : nat * nat -> nat
```

□