BFNP–F2014, Functional Programming The IT University, Spring 2014

Exercise 1

Last update 2013-12-22

This exercise sheet must be handed in via LearnIt by February 21st. You find LearnIt at the following url:
`https://learnit.itu.dk/course/view.php?id=1970125`.
You simply upload one single file called `exercise01_<login>.fs` where `<login>` is your ITU login.

Exercise 1.1 Write a function `sqr:int->int` so that `sqr x` returns x^2.

Exercise 1.2 Write a function `pow : float -> float -> float` so that `pow x n` returns x^n.
You can use the library function: `System.Math.Pow`.

Exercise 1.3 Solve HR, exercise 1.1

Exercise 1.4 Solve HR, exercise 1.2

Exercise 1.5 Solve HR, exercise 1.4

Exercise 1.6 Solve HR, exercise 1.5

Exercise 1.7 Solve HR, exercise 1.6

Exercise 1.8 Solve HR, exercise 1.7

Exercise 1.9 Solve HR, exercise 1.8

Exercise 1.10 Write a function `dup:string->string` that concatenates a string with itself.
You can either use + or ^. For example:

```
val dup : string -> string

> dup "Hi ";;
val it : string = "Hi Hi "
```

Exercise 1.11 Write a function `dupn:string->int->string` so that `dupn s n` creates the concatenation of `n` copies of `s`. For example:

```
val dupn : string -> int -> string

> dupn "Hi " 3;;
val it : string = "Hi Hi Hi "
```

Exercise 1.12 Assume the time of day is represented as a pair `(hh, mm):int*int`.
Write a function `timediff:int*int->int*int->int` so that `timediff t1 t2` computes the difference in minutes between `t1` and `t2`, i.e., `t2-t1`. A few examples:

```
val timediff : int * int -> int * int -> int

> timediff (12,34) (11,35);;
val it : int = -59
> timediff (12,34) (13,35);;
val it : int = 61
```

Exercise 1.13 Write a function `minutes:int*int->int` to compute the number of minutes since midnight. Easily done using the function `timediff`. A few examples:

```
val minutes : int * int -> int

> minutes (14,24);;
val it : int = 864
> minutes (23,1);;
val it : int = 1381
```

Exercise 1.14 Solve HR, exercise 2.2

Exercise 1.15 Solve HR, exercise 2.8

Exercise 1.16 Solve HR, exercise 2.9

Exercise 1.17 Solve HR, exercise 2.10

Exercise 1.18 Solve HR, exercise 2.13