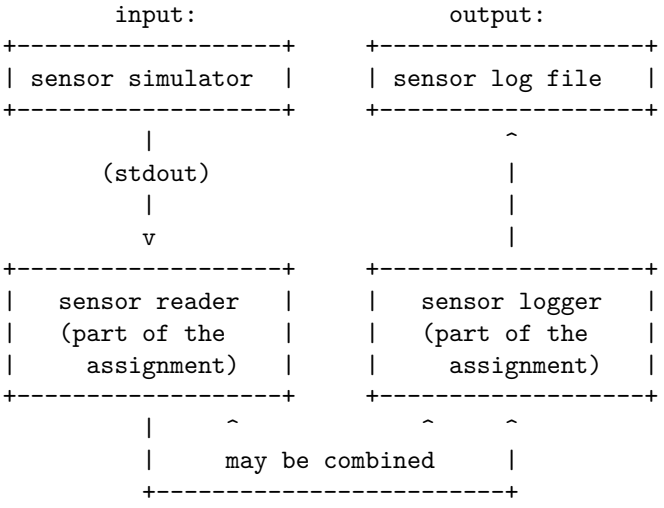
The assignment

The assignment is to *read input* from a number of sensors and *output log files*. If you feel adventurous, you are encouraged to include network communication between the software reading the sensor values and the software creating the log files, as we often have an embedded client communicating with a server software.



Sensor data

A process simulates sensors sending data to you. Instead of reading from SPI, I2C, some register or something similar, typical embedded, our simulator just outputs data on `stdout`. The data is in a binary format, described below in the *Sensor data format*. The simulator can be spawned with a `--name` argument. If no name is given, a random name will be generated. This means that your program can communicate with several sensor simulator processes.

The simulator will most of the time send both `temperature` and `humidity` but can also choose to send one or none of them.

Log file

The log file shall contain logs of the sensor data in JSON-format. Each log line shall contain one JSON document, with the following format:

Key	Required	Format/Unit	Type
`timestamp`	Yes	`ISO 8601 with time zone`	UTF-8 String
`name`	Yes		UTF-8 String
`temperature`	If present	`°C`	Float
`humidity`	If present	%	Float

E.g:

```
{
    "timestamp": "2008-09-15T15:53:00+05:00",
    "name": "sensor1",
    "temperature": 273.15
    "humidity": 99.1
}
```

Sensor data format

The sensor data is a binary format. Each reading will be packaged with the length of the packet, a timestamp, a name of the sensor, and the available sensor readings. Strings are in *UTF-8*. Numerical values are in *network byte order*.

Offset	Field name	Type	Size	Description
`0`	`plength`	`unsigned integer`	`4 bytes`	The length of package, including this field
`4`	`timestamp`	`unsigned integer`	`8 bytes`	Unix timestamp, in milliseconds
`12`	`nlen`	`unsigned integer`	`1 byte`	The length of the name
`13`	`name`	`string`	`nlen bytes`	The length of the name
`13 + nlen`	`temperature`	`unsigned integer`	`3 bytes`	In hundredths of `K`
`16 + nlen` (`13 + nlen`)	`humidity`	`unsigned integer`	`2 bytes`	Relative humidity in ‰

Note: Both `temperature` and `humidity` are optional. This means that the offset for `humidity` can also be `13 + nlen`.