

# Application Challenge

To solve this challenge, you do not need any user interface, data base or special infrastructure. Clean code and meaningful tests are important for us. Please use C#, Java or C++ to implement the solution.

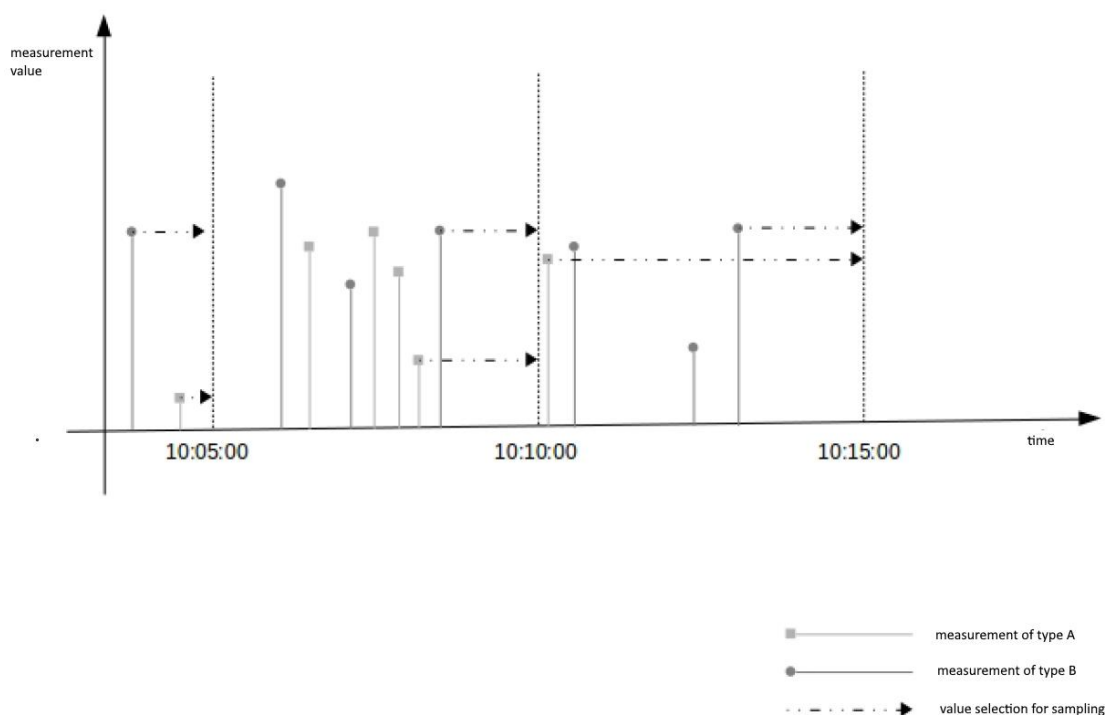
Imagine you are part of a Software team and got the challenge to write a program that is able to sample time-based measurement data received from a medical device. The measurement data have the following structure:

```
class Measurement
{
    private DateTime measurementTime;
    private Double measurementValue;
    private MeasurementType type;
}
```

Possible types of measurements are for example temperature, heart rate or SpO2. Measurements are measured exact to the second.

Your challenge is to sample the received measurements into a 5-minute interval based on the following rules:

- each type of measurement shall be sampled separately
- from a 5-minute interval only the last measurement shall be taken
- if a measurement timestamp will exactly match a 5-minute interval border, it shall be used for the current interval
- the input values are not sorted by time
- the output shall be sorted by time ascending



Example:

INPUT:

```
{2017-01-03T10:04:45, TEMP, 35.79}  
{2017-01-03T10:01:18, SPO2, 98.78}  
{2017-01-03T10:09:07, TEMP, 35.01}  
{2017-01-03T10:03:34, SPO2, 96.49}  
{2017-01-03T10:02:01, TEMP, 35.82}  
{2017-01-03T10:05:00, SPO2, 97.17}  
{2017-01-03T10:05:01, SPO2, 95.08}
```

OUTPUT:

```
{2017-01-03T10:05:00, TEMP, 35.79}  
{2017-01-03T10:10:00, TEMP, 35.01}  
{2017-01-03T10:05:00, SPO2, 97.17}  
{2017-01-03T10:10:00, SPO2, 95.08}
```

A team member already suggested a possible signature to start with:

```
public Dictionary<MeasurementType, List<Measurement>> sample(  
    DateTime startOfSampling, List<Measurement> unsampledMeasurements)  
{  
    // your implementation here  
}
```