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Subject: Sintef Long Term Trend index and forecast calculation methods
translated to Java

1. Long Term Trend Index calculation

The Sintef load forecasting algorithm requires the calculation of an index to identify the right element in the long term trend array. Therefore we implemented a method as specified by Sintefs Idar Petersen to always address the right element in the long term trend array by using the right index. As advised we use only the first week of that array then we wrap around.

```
calculateIndexT(long lastMeterValue){
    int retval = 1;

    Calendar cal = Calendar.getInstance();
    cal.setTimeInMillis(lastMeterValue);
    cal.setTimeZone(TimeZone.getTimeZone(timeZone));
    cal.setFirstDayOfWeek(Calendar.SUNDAY);
    cal.set(Calendar.DAY_OF_WEEK, Calendar.SUNDAY);
    cal.set(Calendar.HOUR_OF_DAY, 0);
    cal.set(Calendar.MINUTE, 0);
    cal.set(Calendar.SECOND, 0);
    cal.set(Calendar.MILLISECOND, 0);

    long startofweek = cal.getTimeInMillis();

    retval = (int) ((lastMeterValue-startofweek)/interval);

    return retval;
}
```

2. Forecasting method

Based on the Matlab code received from Sintef we translated the forecasting algorithm to Java. Below the forecasting method is shown.

```
//Forecast
public Forecast forecast(int numSteps,
                        int idx_t,
                        Forecast fcast){

    ...

    for( int i=1; i<=numSteps; i++){

        ...
        //Forecast s1
        double s1_t = states.s1[params.numSlotDay-(i-1)] +
            params.gamma1*e_t;
        fcast.s1[i-1] = shiftRightAdd(s1_t, next_s1);
    }
}
```

```
//Forecast s2
double s2_t = states.s2[params.numSlotWeek-(i-1)] +
              params.gamma2*e_t;

...

}

return fcast;
}
```