

# YOBP

## NÁSTROJ KE ZPRACOVÁNÍ ETAPOVÉHO MĚŘENÍ NIVELAČNÍHO PŘÍSTROJE

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# Motivace

- Zobrazení výsledků etapového měření
- Ukládání dat do databáze typu sqlite3
- Ukázka posunů v rámci etap, ukázka grafu, export databáze do formátu csv

# SOFTWARE



- Programovací jazyk:  
Python
- Vývojové prostředí:  
PyCharm
- Plug – in Pythonu pro  
vývoj GUI: PyQt
- Pomocná databáze:  
sqlite

# GRAFICKÝ NÁVRH DATABÁZE

Time series of levelling measurements (Trimble DINI // Leica LS15 & LS10)

DB name: Levelling.db --sqlite3

	Timestamp	68-1	69-2	71-1	71-2	B01	B02	B03	B04	B05	B06	B07	B08	F4	F5
1	2023-01-15 14:41:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2023-01-15 14:41:30	N	N	N	N	0.08	-0.07	-0.69	-2.22	-2.82	-1.23	-0.93	0.23	0.15	N
3	2023-01-15 14:41:39	N	N	N	N	0.04	-0.27	-0.85	-2.33	-2.92	-1.62	-1.04	0.00	-0.04	0.07

Add data   Delete data   Graph   Export

# GRAFICKÝ NÁVRH DATABÁZE

```
class Window(QtWidgets.QMainWindow):  
    def __init__(self):  
        super(Window, self).__init__()  
        self.ui = Ui_MainWindow()  
        self.ui.setupUi(self)  
        self.showDB()  
  
        self.connection = sqlite3.connect("Levelling.db")  
        self.cursor = self.connection.cursor()  
  
        self.ui.add_button.clicked.connect(self.btnAddMeas)  
        self.ui.delete_button.clicked.connect(self.btnDeleteMeas)  
        self.ui.exp.clicked.connect(self.btnExportMeas)  
        self.ui.graph_button.clicked.connect(self.btnGraphMeas)
```

```
class Ui_MainWindow(object):  
    def setupUi(self, MainWindow):  
        MainWindow.setObjectName("MainWindow")  
        MainWindow.showMaximized()  
        MainWindow.setWindowIcon(QIcon('img/icon.png'))  
        MainWindow.setWindowTitle('Time series of levelling measurements  
(Trimble DINI // Leica LS15 & LS10)')
```

For M5 Adr	1 TO	ko220304.dat							
For M5 Adr	2 TO	Pocatek poradu	ZV	KO1					
For M5 Adr	3 KD1	F2		KO1					
For M5 Adr	4 KD1	F2	15.0 C	2 KO1 Rb	0.93835 m	HD	21.640 m	Z	10.00000 m
For M5 Adr	5 TO	Vlozene zamery		KO1					
For M5 Adr	6 KD1	F4	15.0 C	2 KO1 Rz	0.65874 m	HD	10.400 m	Z	10.27961 m
For M5 Adr	7 TO	Konec vlozenych zamer		KO1					
For M5 Adr	8 KD1	PR1	14.0 C	3 KO1 Rf	2.92080 m	HD	20.359 m	Z	8.01755 m
For M5 Adr	9 KD1	PR1	14.0 C	KO1					
For M5 Adr	10 KD1	PR1	13.0 C	3 KO1 Rb	0.19645 m	HD	13.223 m	Z	
For M5 Adr	11 TO	Vlozene zamery		KO1					
For M5 Adr	12 KD1	B01	13.0 C	3 KO1 Rz	0.23354 m	HD	12.108 m	Z	7.98046 m
For M5 Adr	13 KD1	B02	13.0 C	2 KO1 Rz	1.47671 m	HD	1.657 m	Z	6.73729 m
For M5 Adr	14 KD1	B03	13.0 C	2 KO1 Rz	1.62390 m	HD	2.460 m	Z	6.59010 m
For M5 Adr	15 KD1	B04	13.0 C	2 KO1 Rz	2.40871 m	HD	9.583 m	Z	5.80529 m
For M5 Adr	16 KD1	B05	13.0 C	2 KO1 Rz	2.55676 m	HD	11.333 m	Z	5.65724 m
For M5 Adr	17 TO	Konec vlozenych zamer		KO1					
For M5 Adr	18 KD1	PR2	12.0 C	2 KO1 Rf	2.55669 m	HD	11.333 m	Z	
For M5 Adr	19 KD1	PR2	12.0 C	KO1					
For M5 Adr	20 KD1	PR2	12.0 C	2 KO1 Rb	0.59851 m	HD	7.378 m	Z	5.65731 m
For M5 Adr	21 TO	Vlozene zamery		KO1					
For M5 Adr	22 KD1	B06	11.0 C	2 KO1 Rz	1.15696 m	HD	2.729 m	Z	5.09886 m
For M5 Adr	23 KD1	B07	11.0 C	2 KO1 Rz	1.28166 m	HD	2.106 m	Z	4.97416 m
For M5 Adr	24 KD1	B08	11.0 C	2 KO1 Rz	2.64949 m	HD	11.592 m	Z	3.60633 m
For M5 Adr	25 TO	Konec vlozenych zamer		KO1					
For M5 Adr	26 KD1	PR3	11.0 C	2 KO1 Rf	0.59856 m	HD	7.379 m	Z	
For M5 Adr	27 KD1	PR3	11.0 C	KO1					
For M5 Adr	28 KD1	PR3	11.0 C	2 KO1 Rb	2.61923 m	HD	11.670 m	Z	5.65726 m
For M5 Adr	29 KD1	PR4	11.0 C	2 KO1 Rf	0.25908 m	HD	12.917 m	Z	
For M5 Adr	30 KD1	PR4	11.0 C	KO1					
For M5 Adr	31 KD1	PR4	10.0 C	2 KO1 Rb	2.96736 m	HD	20.141 m	Z	8.01741 m
For M5 Adr	32 TO	Vlozene zamery		KO1					
For M5 Adr	33 KD1	F4	10.0 C	2 KO1 Rz	0.70508 m	HD	10.632 m	Z	10.27969 m
For M5 Adr	34 TO	Konec vlozenych zamer		KO1					
For M5 Adr	35 KD1	F2	10.0 C	2 KO1 Rf	0.98450 m	HD	21.748 m	Z	
For M5 Adr	36 KD1	F2	10.0 C	KO1					
For M5 Adr	37 KD1	F2		KO1 Sh	0.00027 m	dz	-0.00027 m	Z	10.00000 m
For M5 Adr	38 KD2	F2	5	KO1 Db	74.05 m	Df	73.74 m	Z	10.00027 m
For M5 Adr	39 TO	Konec poradu		KO1					

# VSTUPNÍ SOUBOR

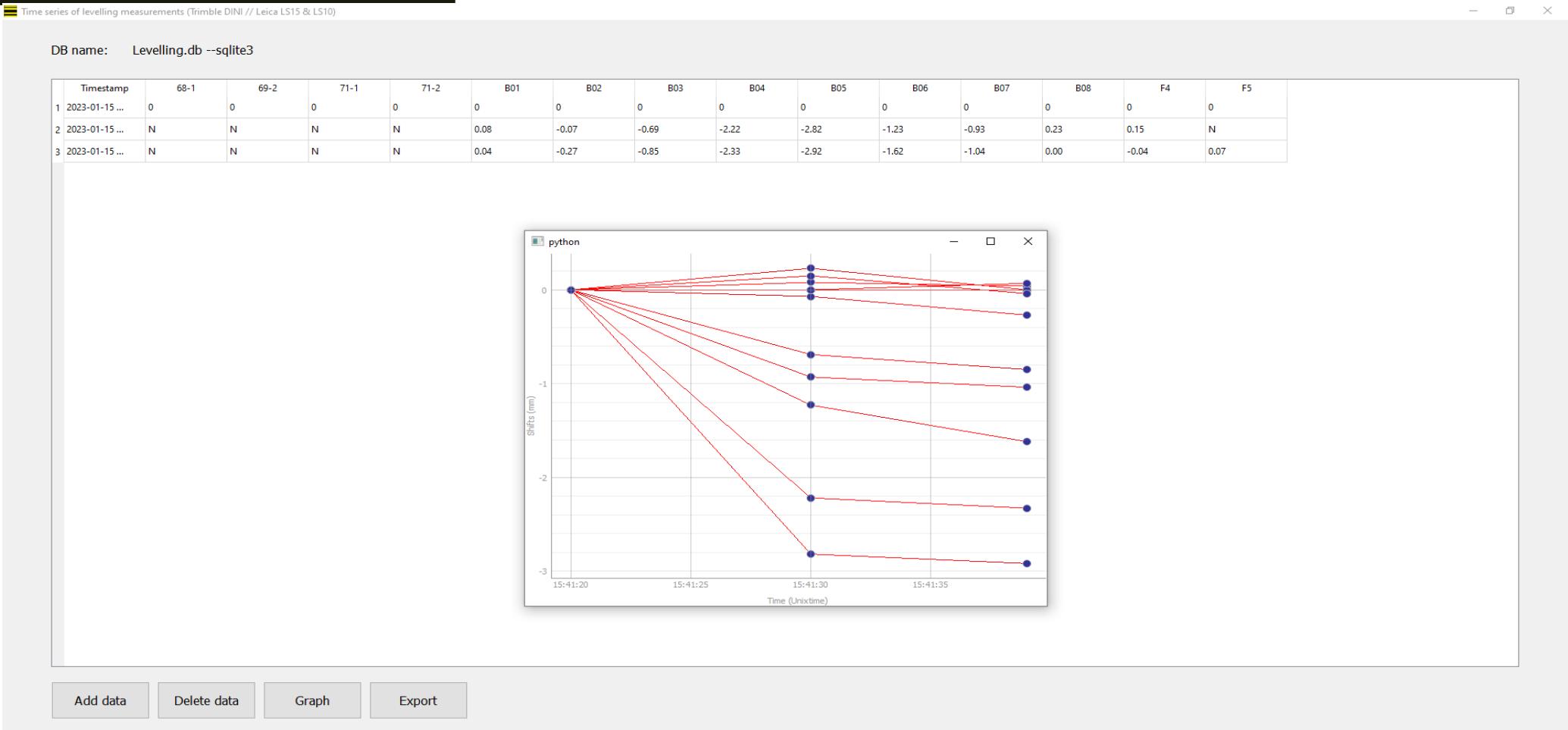
—

# TRIMBLE DAT

# STRUKTURA DATABÁZE

id	timestamp	level	unixtimestamp	
	Filtr	Filtr	Filtr	
1	F4	2023-01-15 14:41:20	10.27946	1673793680
2	69-2	2023-01-15 14:41:20	7.89205	1673793680
3	B01	2023-01-15 14:41:20	7.98038	1673793680
4	B02	2023-01-15 14:41:20	6.73736	1673793680
5	68-1	2023-01-15 14:41:20	6.59999	1673793680
6	B03	2023-01-15 14:41:20	6.59079	1673793680
7	B04	2023-01-15 14:41:20	5.80751	1673793680
8	B05	2023-01-15 14:41:20	5.66006	1673793680
9	B06	2023-01-15 14:41:20	5.10009	1673793680
10	71-2	2023-01-15 14:41:20	4.89348	1673793680
11	B07	2023-01-15 14:41:20	4.97509	1673793680
12	F5	2023-01-15 14:41:20	4.38197	1673793680
13	B08	2023-01-15 14:41:20	3.6061	1673793680
14	71-1	2023-01-15 14:41:20	3.49772	1673793680
15	F4	2023-01-15 14:41:30	10.27961	1673793690
16	B01	2023-01-15 14:41:30	7.98046	1673793690
17	B02	2023-01-15 14:41:30	6.73729	1673793690
18	B03	2023-01-15 14:41:30	6.5901	1673793690
19	B04	2023-01-15 14:41:30	5.80529	1673793690
20	B05	2023-01-15 14:41:30	5.65724	1673793690
21	B06	2023-01-15 14:41:30	5.09886	1673793690
22	B07	2023-01-15 14:41:30	4.97416	1673793690
23	B08	2023-01-15 14:41:30	3.60633	1673793690

# GRAF



```
class Graph(QtWidgets.QMainWindow):
    def __init__(self, connection, cursor):
        super().__init__()
        self.connection = connection
        self.cursor = cursor
        self.create_layouts()

    def create_layouts(self):
        self.main_layout = pg.PlotWidget(axisItems={'bottom': pg.DateAxisItem()})
        self.setCentralWidget(self.main_layout)

        self.main_layout.setBackground('w')
        self.main_layout.setLabel('left', 'Shifts', units='mm')
        self.main_layout.setLabel('bottom', 'Time', units='Unixtime')
        self.main_layout.showGrid(x=True, y=True)
        self.main_layout.addLegend()
        pen = pg.mkPen(color=(255, 0, 0))

        #plot
        for i in range(0, len(data), len(unixtime)):
            dat = data[i:i+len(unixtime)]
            self.main_layout.plot(unixtime, dat, symbol='o', pen=pen)
        self.main_layout.show()
```

# GRAF

# EXPORT CSV

The screenshot shows a Microsoft Excel spreadsheet with the following details:

- Header Row:** The first row contains the column headers "id,timestamp,level".
- Data Rows:** Rows 3 through 28 contain timestamped log entries. For example:
  - Row 3: F4,2023-01-15 14:41:20,10.27946
  - Row 4: 69-2,2023-01-15 14:41:20,7.89205
  - Row 5: B01,2023-01-15 14:41:20,7.98038
  - Row 6: B02,2023-01-15 14:41:20,6.73736
  - Row 7: 68-1,2023-01-15 14:41:20,6.59999
  - Row 8: B03,2023-01-15 14:41:20,6.59079
  - Row 9: B04,2023-01-15 14:41:20,5.80751
  - Row 10: B05,2023-01-15 14:41:20,5.66006
  - Row 11: B06,2023-01-15 14:41:20,5.10009
  - Row 12: 71-2,2023-01-15 14:41:20,4.89348
  - Row 13: B07,2023-01-15 14:41:20,4.97509
  - Row 14: F5,2023-01-15 14:41:20,4.38197
  - Row 15: B08,2023-01-15 14:41:20,3.6061
  - Row 16: 71-1,2023-01-15 14:41:20,3.49772
  - Row 17: F4,2023-01-15 14:41:30,10.27961
  - Row 18: B01,2023-01-15 14:41:30,7.98046
  - Row 19: B02,2023-01-15 14:41:30,6.73729
  - Row 20: B03,2023-01-15 14:41:30,6.5901
  - Row 21: B04,2023-01-15 14:41:30,5.80529
  - Row 22: B05,2023-01-15 14:41:30,5.65724
  - Row 23: B06,2023-01-15 14:41:30,5.09886
  - Row 24: B07,2023-01-15 14:41:30,4.97416
  - Row 25: B08,2023-01-15 14:41:30,3.60633
  - Row 26: F4,2023-01-15 14:41:39,10.27942
  - Row 27: B01,2023-01-15 14:41:39,7.98042
  - Row 28: B02,2023-01-15 14:41:39,6.73709
- Bottom Row:** The last row contains the word "export".
- Toolbar:** The ribbon bar includes tabs like Soubor, Domů, Vložení, Rozložený stránky, Data, Revize, Zobrazení, Automatizovat, Vývojář, and Nápověda.
- Formulas Bar:** The formula bar shows the cell reference A35 and the value B08,2023-01-15 14:41:39,3.6061.
- Status Bar:** The status bar at the bottom right shows "Připraven" and "100 %".

Sometimes my code  
is like this.....



Don't know, what it does.  
But i am scared to delete.

DĚKUJI ZA  
POZORNOST.