



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)')
```


STRUKTURA DATABÁZE

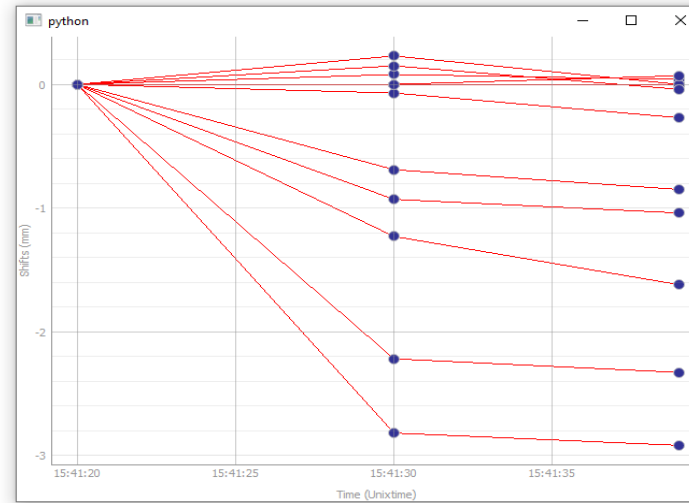
	id	timestamp	level	unixtimestamp
	Filtr	Filtr	Filtr	Filtr
1	F4	2023-01-15 14:41:20	10.27946	1673793680
2	69-2	2023-01-15 14:41:20	7.89205	1673793680
3	B01	2023-01-15 14:41:20	7.98038	1673793680
4	B02	2023-01-15 14:41:20	6.73736	1673793680
5	68-1	2023-01-15 14:41:20	6.59999	1673793680
6	B03	2023-01-15 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

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 ...	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	2023-01-15 ...	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 ...	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


```

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

	A	B	C	D	E	F
1	id,timestamp,level					
2						
3	F4,2023-01-15 14:41:20,10.27946					
4	69-2,2023-01-15 14:41:20,7.89205					
5	B01,2023-01-15 14:41:20,7.98038					
6	B02,2023-01-15 14:41:20,6.73736					
7	68-1,2023-01-15 14:41:20,6.59999					
8	B03,2023-01-15 14:41:20,6.59079					
9	B04,2023-01-15 14:41:20,5.80751					
10	B05,2023-01-15 14:41:20,5.66006					
11	B06,2023-01-15 14:41:20,5.10009					
12	71-2,2023-01-15 14:41:20,4.89348					
13	B07,2023-01-15 14:41:20,4.97509					
14	F5,2023-01-15 14:41:20,4.38197					
15	B08,2023-01-15 14:41:20,3.6061					
16	71-1,2023-01-15 14:41:20,3.49772					
17	F4,2023-01-15 14:41:30,10.27961					
18	B01,2023-01-15 14:41:30,7.98046					
19	B02,2023-01-15 14:41:30,6.73729					
20	B03,2023-01-15 14:41:30,6.5901					
21	B04,2023-01-15 14:41:30,5.80529					
22	B05,2023-01-15 14:41:30,5.65724					
23	B06,2023-01-15 14:41:30,5.09886					
24	B07,2023-01-15 14:41:30,4.97416					
25	B08,2023-01-15 14:41:30,3.60633					
26	F4,2023-01-15 14:41:39,10.27942					

1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 26

Sometimes my code
is like this.....



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

DĚKUJI ZA
POZORNOST.