

Inleiding programmeren

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<http://prognosis.mprog.nl>

Week 7: data-analyse

programma

week 1: *Python syntax*

week 3: *Python syntax*

week 5: *Python syntax*

week 2

basis wiskunde

week 4

integreren + fit

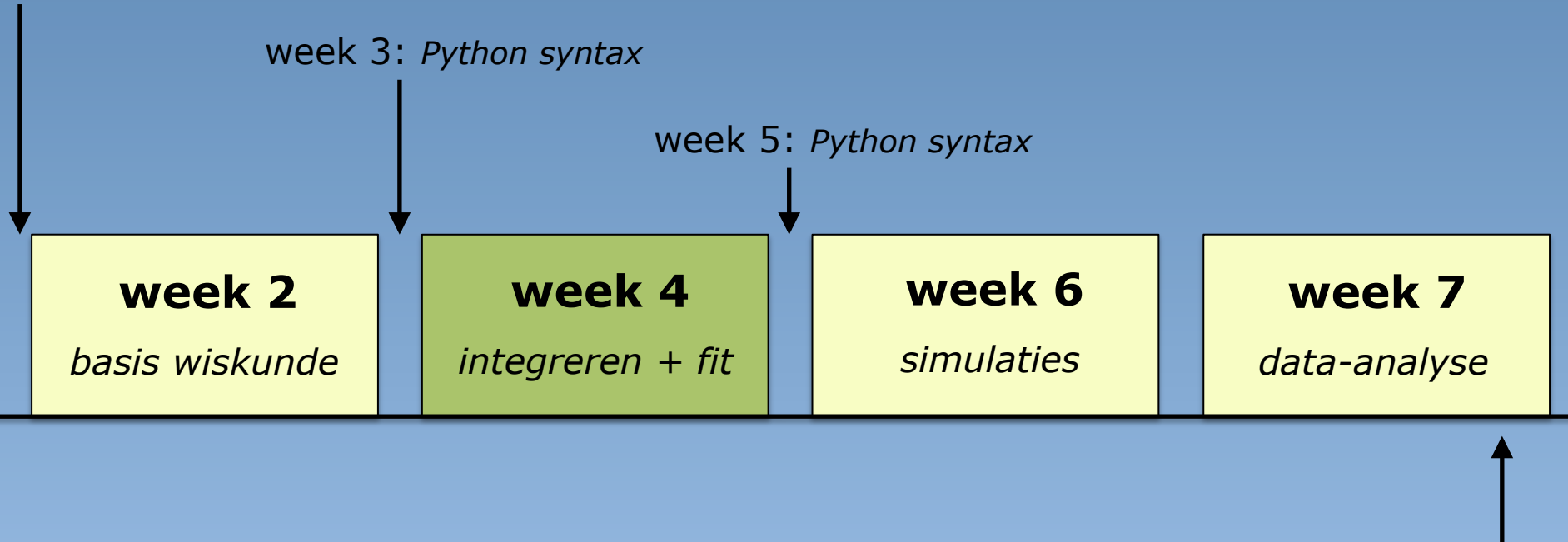
week 6


simulaties

week 7

data-analyse

Tentamen





Python
bouwstenen
voor deze week

Python week 1-6

- Logica
- Lijsten, Tuples
- Functies
- Plotten Matplotlib
- ***Reading data-file***

Let op: CSV-reader vandaag niet toegestaan
lees regel in en gebruik **split()** functie

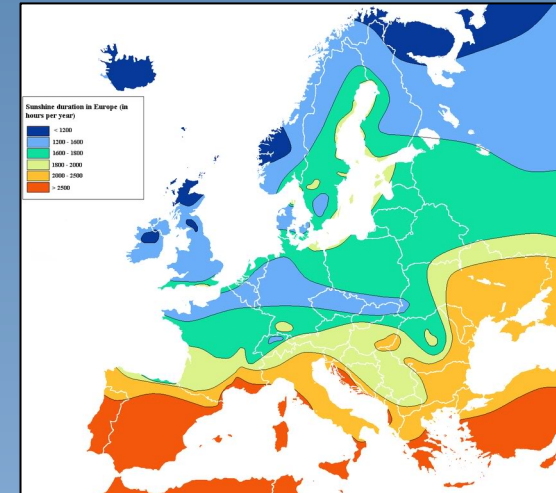
Opgave 1: klimaatdiscussie

Data: temperatuur per dag in De Bilt

```
12 08-13 SQUID: Source identifier
13 15-22 DATE : Date YYYYMMDD
14 24-28 TX : Maximum temperature in 0.1 °C
15 30-34 Q_TX : quality code for TX (0='valid'; 1='suspect'; 9='missing')
16
17 This is the blended series of station DE BILT, NETHERLANDS (STAID: 162)
18 Blended and updated with sources:522 2128
19 See files sources.txt and stations.txt for more info.
```

```
21 STAID, SQUID, DATE, TX, Q_TX
22 162, 522, 19010101, -31, 0
23 162, 522, 19010102, -13, 0
24 162, 522, 19010103, -5, 0
25 162, 522, 19010104, -10, 0
26 162, 522, 19010105, -18, 0
27 162, 522, 19010106, -78, 0
28 162, 522, 19010107, -66, 0
29 162, 522, 19010108, -6, 0
```

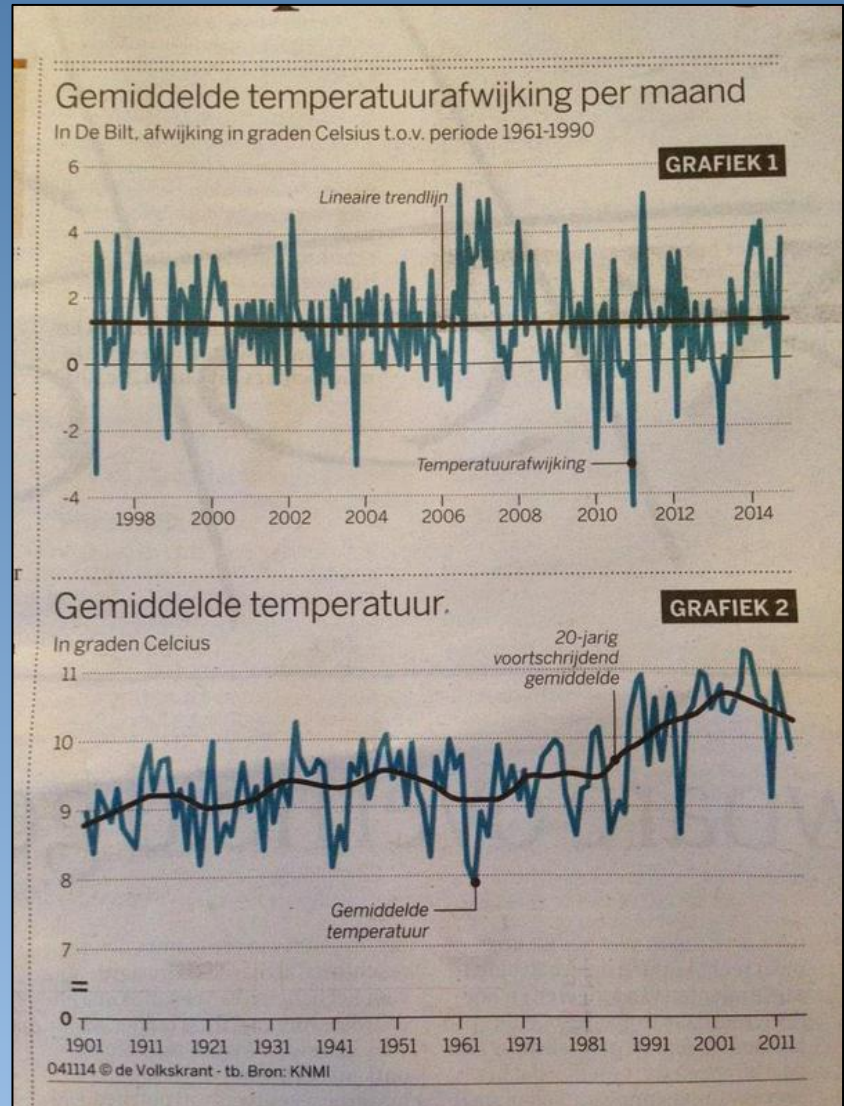
Maximum temperatuur op
1 januari 1901 was -3.1 °C



Vragen:

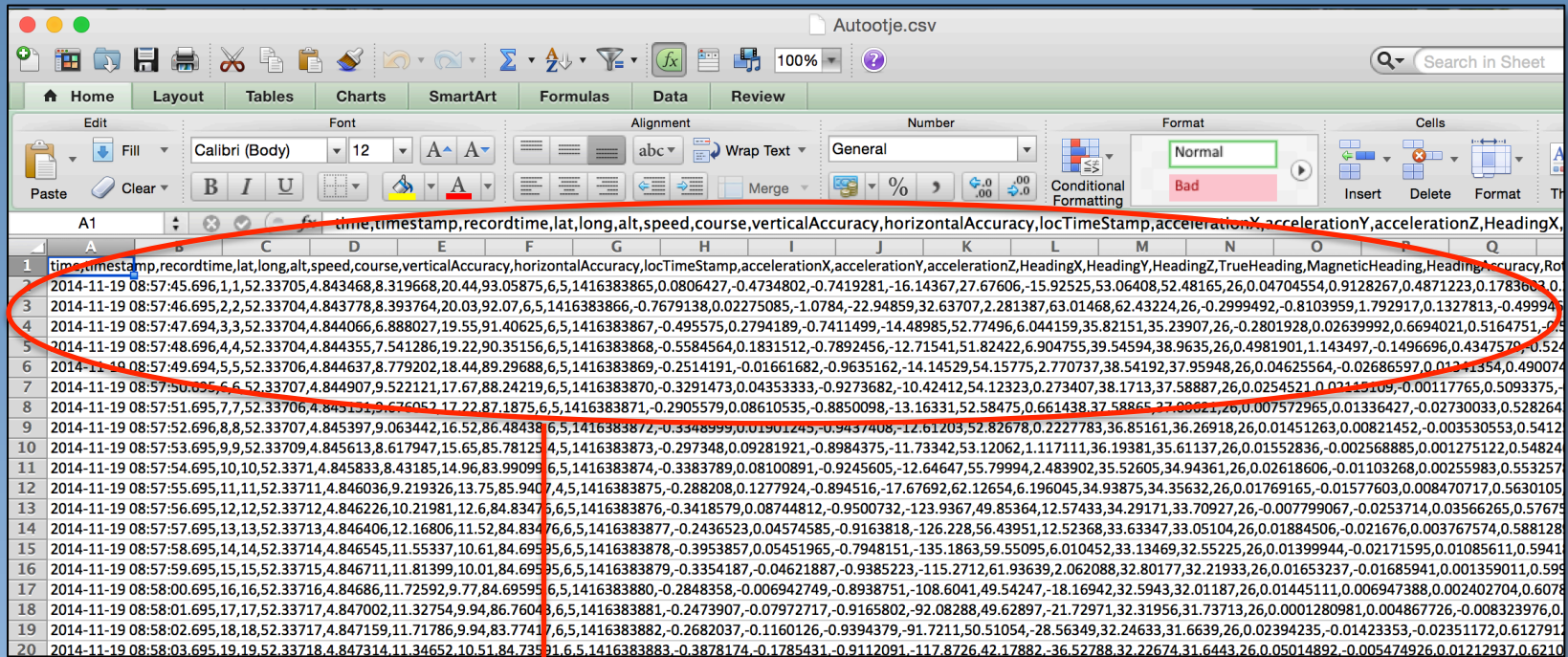
- maximum en minimum temperatuur in 20e eeuw
- langste vorstperiode
- gemiddelde temperatuur op je verjaardag en de distributie zelf
- ...

Volkskrant 3 november



Opgave 2: sensor-data iPhone

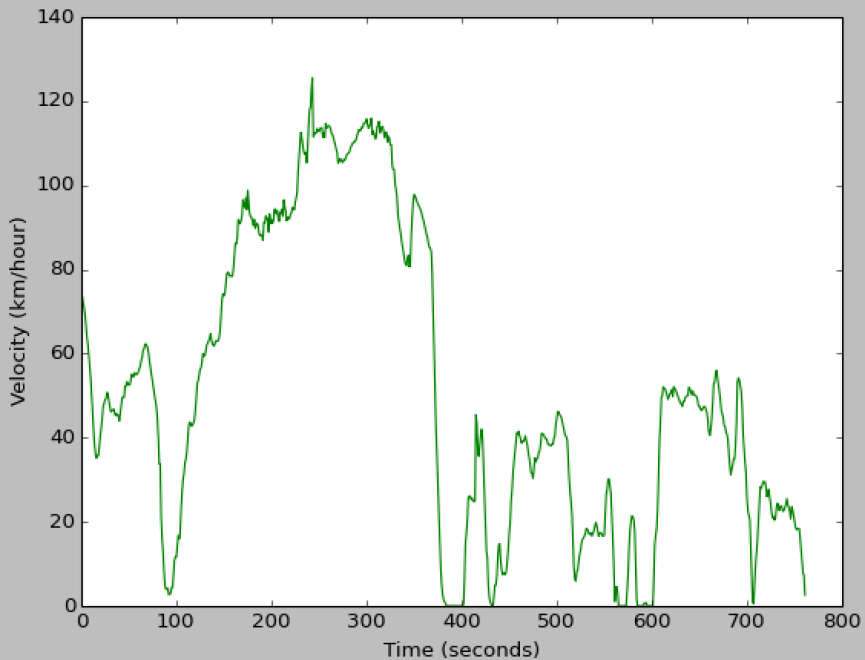
Data verzameld van alle sensor-data in iPhone: **SensorLog App**



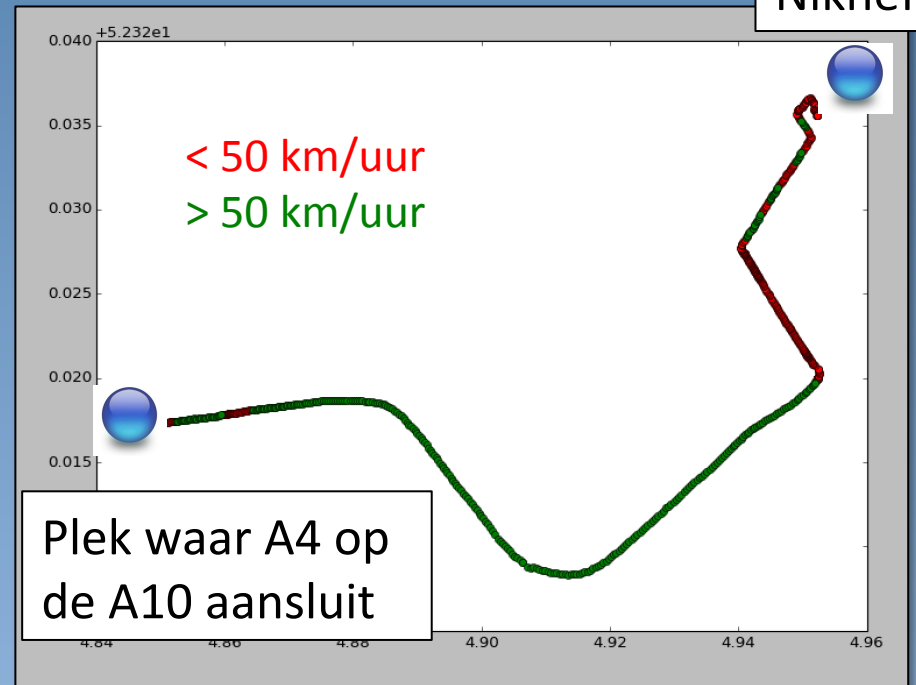
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	time	timestamp	recordtime	lat	long	alt	speed	course	vertical	Accuracy	horizontal	Accuracy	locTime	timestamp	accelerationX	accelerationY	accelerationZ	HeadingX
2	2014-11-19 08:57:45.696	1,1	52.33705	4.843468	8.319668	20.44	93.05875	6,5	1416383865	0.0806427	-0.4734802	-0.7419281	-16.14367	27.67606	-15.92525	53.06408	52.48165	26,0
3	2014-11-19 08:57:46.695	2,2	52.33704	4.843778	8.393764	20.03	92.07	6,5	1416383866	-0.7679138	0.02275085	-1.0784	-22.94859	32.63707	2.281387	63.01468	62.43224	26,-0.2999492
4	2014-11-19 08:57:47.694	3,3	52.33704	4.844066	6.888027	19.55	91.40625	6,5	1416383867	-0.495575	0.2794189	-0.7411499	-14.48985	52.77496	6.044159	35.82151	35.23907	26,-0.2801928
5	2014-11-19 08:57:48.696	4,4	52.33704	4.844355	7.541286	19.22	90.35156	6,5	1416383868	-0.5584564	0.1831512	-0.7892456	-12.71541	51.82422	6.904755	39.54594	38.9635	26,0.4981901
6	2014-11-19 08:57:49.694	5,5	52.33706	4.844637	8.779202	18.44	89.29688	6,5	1416383869	-0.2514191	-0.01661682	-0.9635162	-14.14529	54.15775	2.770737	38.54192	37.95948	26,0.04625564
7	2014-11-19 08:57:50.695	6,6	52.33707	4.844907	9.522121	17.67	88.24219	6,5	1416383870	-0.3291473	0.04353333	-0.9273682	-10.42412	54.12323	0.273407	38.1713	37.58887	26,0.0254521
8	2014-11-19 08:57:51.695	7,7	52.33706	4.845131	9.576052	17.22	87.1875	6,5	1416383871	-0.2905579	0.08610535	-0.8850098	-13.16331	52.58475	0.661438	37.58865	37.00021	26,0.007572965
9	2014-11-19 08:57:52.696	8,8	52.33707	4.845397	9.063442	16.52	86.48438	6,5	1416383872	-0.3348999	0.01901245	-0.9437408	-12.61203	52.82678	0.2227783	36.85161	36.26918	26,0.01451263
10	2014-11-19 08:57:53.695	9,9	52.33709	4.845613	8.617947	15.65	85.78125	4,5	1416383873	-0.297348	0.09281921	-0.8984375	-11.73342	53.12062	1.117111	36.19381	35.61137	26,0.01552836
11	2014-11-19 08:57:54.695	10,10	52.3371	4.845833	8.43185	14.96	83.99099	6,5	1416383874	-0.3383789	0.08100891	-0.9245605	-12.64647	55.79994	2.483902	35.52605	34.94361	26,0.02618606
12	2014-11-19 08:57:55.695	11,11	52.33711	4.846036	9.219326	13.75	85.9407	4,5	1416383875	-0.288208	0.1277924	-0.894516	-17.67692	62.12654	6.196045	34.93875	34.35632	26,0.01769165
13	2014-11-19 08:57:56.695	12,12	52.33712	4.846226	10.21981	12.6	84.8347	6,5	1416383876	-0.3418579	0.08744812	-0.9500732	-123.9367	49.85364	12.57433	34.29171	33.70927	26,-0.007799067
14	2014-11-19 08:57:57.695	13,13	52.33713	4.846406	12.16806	11.52	84.8347	6,5	1416383877	-0.2436523	0.04574585	-0.9163818	-126.228	56.43951	12.52368	33.63347	33.05104	26,0.01884506
15	2014-11-19 08:57:58.695	14,14	52.33714	4.846545	11.55337	10.61	84.69595	6,5	1416383878	-0.3953857	0.05451965	-0.7948151	-135.1863	59.55095	6.010452	33.13469	32.55225	26,0.01399944
16	2014-11-19 08:57:59.695	15,15	52.33715	4.846711	11.81399	10.01	84.69595	6,5	1416383879	-0.3354187	-0.04621887	-0.9385223	-115.2712	61.93639	2.062088	32.80177	32.21933	26,0.01653237
17	2014-11-19 08:58:00.695	16,16	52.33716	4.84686	11.72592	9.77	84.69595	6,5	1416383880	-0.2848358	-0.006942749	-0.8938751	-108.6041	49.54247	-18.16942	32.5943	32.01187	26,0.01445111
18	2014-11-19 08:58:01.695	17,17	52.33717	4.847002	11.32754	9.94	86.76043	6,5	1416383881	-0.2473907	-0.07972717	-0.9165802	-92.08288	49.62897	-21.72971	32.31956	31.73713	26,0.0001280981
19	2014-11-19 08:58:02.695	18,18	52.33717	4.847159	11.71786	9.94	83.77417	6,5	1416383882	-0.2682037	-0.1160126	-0.9394379	-91.7211	50.51054	-28.56349	32.24633	31.6639	26,0.02394235
20	2014-11-19 08:58:03.695	19,19	52.33718	4.847314	11.34652	10.51	84.73591	6,5	1416383883	-0.3878174	-0.1785431	-0.9112091	-117.8726	42.17882	-36.52788	32.22674	31.6443	26,0.05014892

Tijd, GPS, snelheid, versnelling, ...

Snelheid versus tijd



GPS-positie



Succes met de opgaves