

# A Day Has Only $24 \pm 1$ Hours

Miroslav Šedivý

 eumiro

solute 

# A Day Has Only $24 \pm 1$ Hours

# A Day Has Only $24 \pm 1$ Hours

- check the time

# A Day Has Only $24 \pm 1$ Hours

- check the time
- don't check the time too often

# A Day Has Only $24 \pm 1$ Hours

- check the time
- don't check the time too often
- check what your government does

# Miroslav Šedivý

[ˈmɪrɔslav ˈʃɛɟɪviː]

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- born in Bratislava, Czechoslovakia (TZ=Europe/Bratislava)

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- born in Bratislava, Czechoslovakia (TZ=Europe/Bratislava)
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- Senior Software Developer at solute GmbH, Karlsruhe, Germany (TZ=Europe/Berlin)

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- born in Bratislava, Czechoslovakia (TZ=Europe/Bratislava)
- M.Sc. at INSA Lyon, France (TZ=Europe/Paris)
- Senior Software Developer at solute GmbH, Karlsruhe, Germany (TZ=Europe/Berlin)

## The whole life in the CE(S)T!

**solute**



Thursday, 11th July 2019

10:33 CEST

(Basel, Switzerland)

```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
datetime.datetime(2019, 7, 11, 8, 33, 0, 0) # server set to UTC
```

```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
datetime.datetime(2019, 7, 11, 8, 33, 0, 0) # server set to UTC
```

```
>>> datetime.datetime.utcnow()
datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
```

```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
datetime.datetime(2019, 7, 11, 8, 33, 0, 0) # server set to UTC
```

```
>>> datetime.datetime.utcnow()
datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
```

```
>>> datetime.datetime.now(datetime.timezone.utc)
datetime.datetime(2019, 7, 11, 8, 33, 0, 0, tzinfo=datetime.timezone.utc)
```



```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
datetime.datetime(2019, 7, 11, 8, 33, 0, 0) # server set to UTC
```

```
>>> datetime.datetime.utcnow()
datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
```

```
>>> datetime.datetime.now(datetime.timezone.utc)
datetime.datetime(2019, 7, 11, 8, 33, 0, 0, tzinfo=datetime.timezone.utc)
```

```
>>> datetime.datetime.now(datetime.timezone(datetime.timedelta(hours=2)))
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=datetime.timezone(datetime.timedelta(0, 7200)))
```

```
>>> import datetime
>>> datetime.datetime.now()
datetime.datetime(2019, 7, 11, 10, 33, 0, 0)
```

```
datetime.datetime(2019, 7, 11, 8, 33, 0, 0) # server set to UTC
```

```
>>> datetime.datetime.utcnow()
datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
```

```
>>> datetime.datetime.now(datetime.timezone.utc)
datetime.datetime(2019, 7, 11, 8, 33, 0, 0, tzinfo=datetime.timezone.utc)
```

```
>>> datetime.datetime.now(datetime.timezone(datetime.timedelta(hours=2)))
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=datetime.timezone(datetime.timedelta(0, 7200)))
```

```
>>> import pytz
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime(2019, 7, 11, 10, 33, 0, 0, pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' LMT+0:34:00 STD>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime(2019, 7, 11, 10, 33, 0, 0, pytz.timezone('Europe/Zurich'))
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' LMT+0:34:00 STD>)
```

```
>>> pytz.timezone('Europe/Zurich').localize(datetime.datetime(2019, 7, 11, 10, 33, 0, 0))
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime(2019, 7, 11, 10, 33, 0, 0, pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' LMT+0:34:00 STD>)
```

```
>>> pytz.timezone('Europe/Zurich').localize(datetime.datetime(2019, 7, 11, 10, 33, 0, 0))  
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> now + datetime.timedelta(days=184)  
datetime.datetime(2020, 1, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime(2019, 7, 11, 10, 33, 0, 0, pytz.timezone('Europe/Zurich'))  
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' LMT+0:34:00 STD>)
```

```
>>> pytz.timezone('Europe/Zurich').localize(datetime.datetime(2019, 7, 11, 10, 33, 0, 0))  
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> now + datetime.timedelta(days=184)  
datetime.datetime(2020, 1, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> pytz.timezone('Europe/Zurich').normalize(now + datetime.timedelta(days=184))  
datetime.datetime(2020, 1, 11, 9, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CET+1:00:00 STD>)
```

```
>>> datetime.datetime.now(pytz.timezone('Europe/Zurich'))
datetime.datetime(2019, 7, 11, 10, 33, 0, 0, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> datetime.datetime(2019, 7, 11, 10, 33, 0, 0, pytz.timezone('Europe/Zurich'))
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' LMT+0:34:00 STD>)
```

```
>>> pytz.timezone('Europe/Zurich').localize(datetime.datetime(2019, 7, 11, 10, 33, 0, 0))
datetime.datetime(2019, 7, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> now + datetime.timedelta(days=184)
datetime.datetime(2020, 1, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CEST+2:00:00 DST>)
```

```
>>> pytz.timezone('Europe/Zurich').normalize(now + datetime.timedelta(days=184))
datetime.datetime(2020, 1, 11, 9, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CET+1:00:00 STD>)
```

```
>>> pytz.timezone('Europe/Zurich').localize(now.replace(tzinfo=None) + datetime.timedelta(days=184))
datetime.datetime(2020, 1, 11, 10, 33, tzinfo=<DstTzInfo 'Europe/Zurich' CET+1:00:00 STD>)
```



```
>>> date      = datetime.datetime.utcnow().strftime('%Y-%m-%d')
>>> weekday   = datetime.datetime.utcnow().strftime('%A')
'2019-07-11'
'Thursday'
```

```
>>> date      = datetime.datetime.utcnow().strftime('%Y-%m-%d')
>>> weekday   = datetime.datetime.utcnow().strftime('%A')
'2019-07-11'
'Thursday'
```

```
>>> now       = datetime.datetime.utcnow()
>>> date      = now.strftime('%Y-%m-%d')
>>> weekday   = now.strftime('%A')
```

```
>>> date      = datetime.datetime.utcnow().strftime('%Y-%m-%d')
>>> weekday   = datetime.datetime.utcnow().strftime('%A')
'2019-07-11'
'Thursday'
```

```
>>> now       = datetime.datetime.utcnow()
>>> date      = now.strftime('%Y-%m-%d')
>>> weekday   = now.strftime('%A')
```

## Check the time only once!

```
>>> start = datetime.datetime.utcnow()          # datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
>>> expensive_operation()
>>> end = datetime.datetime.utcnow()             # datetime.datetime(2019, 7, 11, 8, 33, 1, 0)
>>> elapsed = (end - start).total_seconds()      # datetime.timedelta(seconds=1) -> 1.0
```

```
>>> start = datetime.datetime.utcnow()          # datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
>>> expensive_operation()
>>> end = datetime.datetime.utcnow()            # datetime.datetime(2019, 7, 11, 8, 33, 1, 0)
>>> elapsed = (end - start).total_seconds()     # datetime.timedelta(seconds=1) -> 1.0
```

```
>>> start = time.time()                        # 1562833980.0
>>> expensive_operation()
>>> end = time.time()                          # 1562833981.0
>>> elapsed = end - start
```

```
>>> start = datetime.datetime.utcnow()          # datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
>>> expensive_operation()
>>> end = datetime.datetime.utcnow()            # datetime.datetime(2019, 7, 11, 8, 33, 1, 0)
>>> elapsed = (end - start).total_seconds()     # datetime.timedelta(seconds=1) -> 1.0
```

```
>>> start = time.time()                        # 1562833980.0
>>> expensive_operation()
>>> end = time.time()                          # 1562833981.0
>>> elapsed = end - start
```

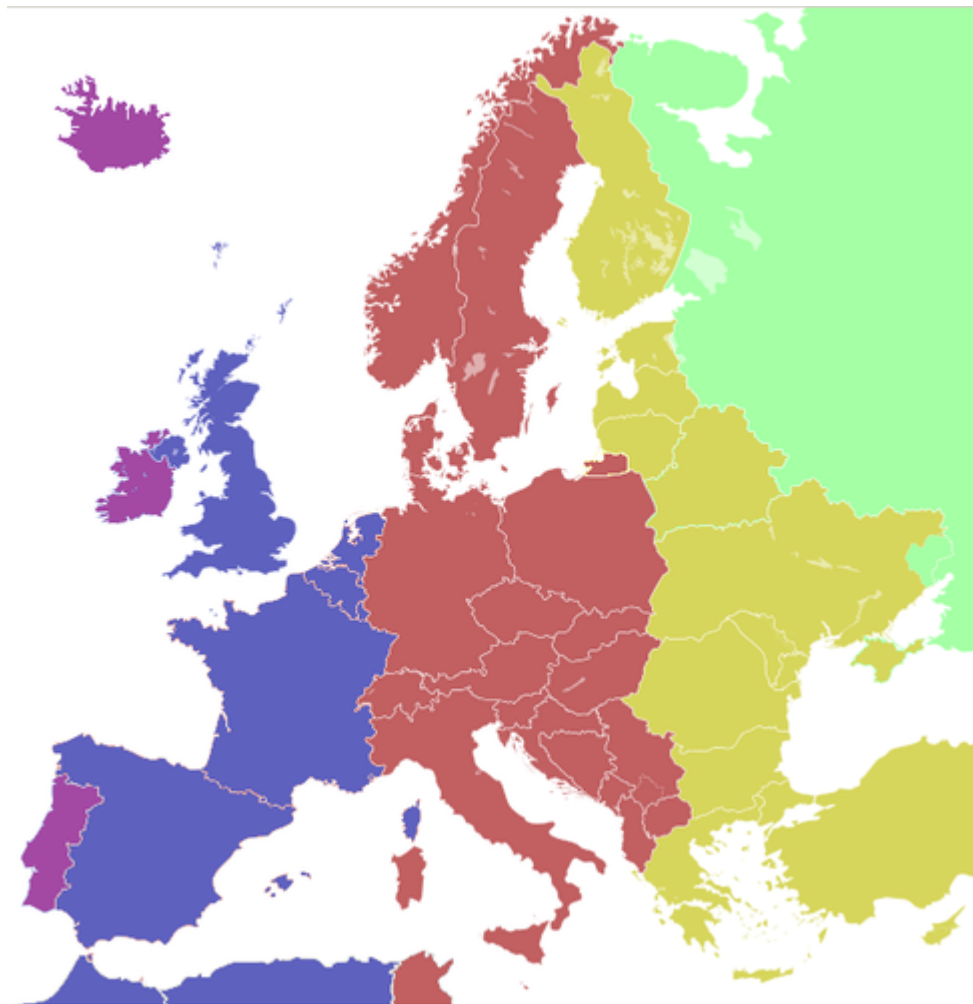
```
>>> start = time.monotonic()                   # 5.0
>>> expensive_operation()
>>> end = time.monotonic()                     # 6.0
>>> elapsed = end - start
```

```
>>> start = datetime.datetime.utcnow()          # datetime.datetime(2019, 7, 11, 8, 33, 0, 0)
>>> expensive_operation()
>>> end = datetime.datetime.utcnow()            # datetime.datetime(2019, 7, 11, 8, 33, 1, 0)
>>> elapsed = (end - start).total_seconds()     # datetime.timedelta(seconds=1) -> 1.0
```

```
>>> start = time.time()                        # 1562833980.0
>>> expensive_operation()
>>> end = time.time()                          # 1562833981.0
>>> elapsed = end - start
```

```
>>> start = time.monotonic()                   # 5.0
>>> expensive_operation()
>>> end = time.monotonic()                     # 6.0
>>> elapsed = end - start
```

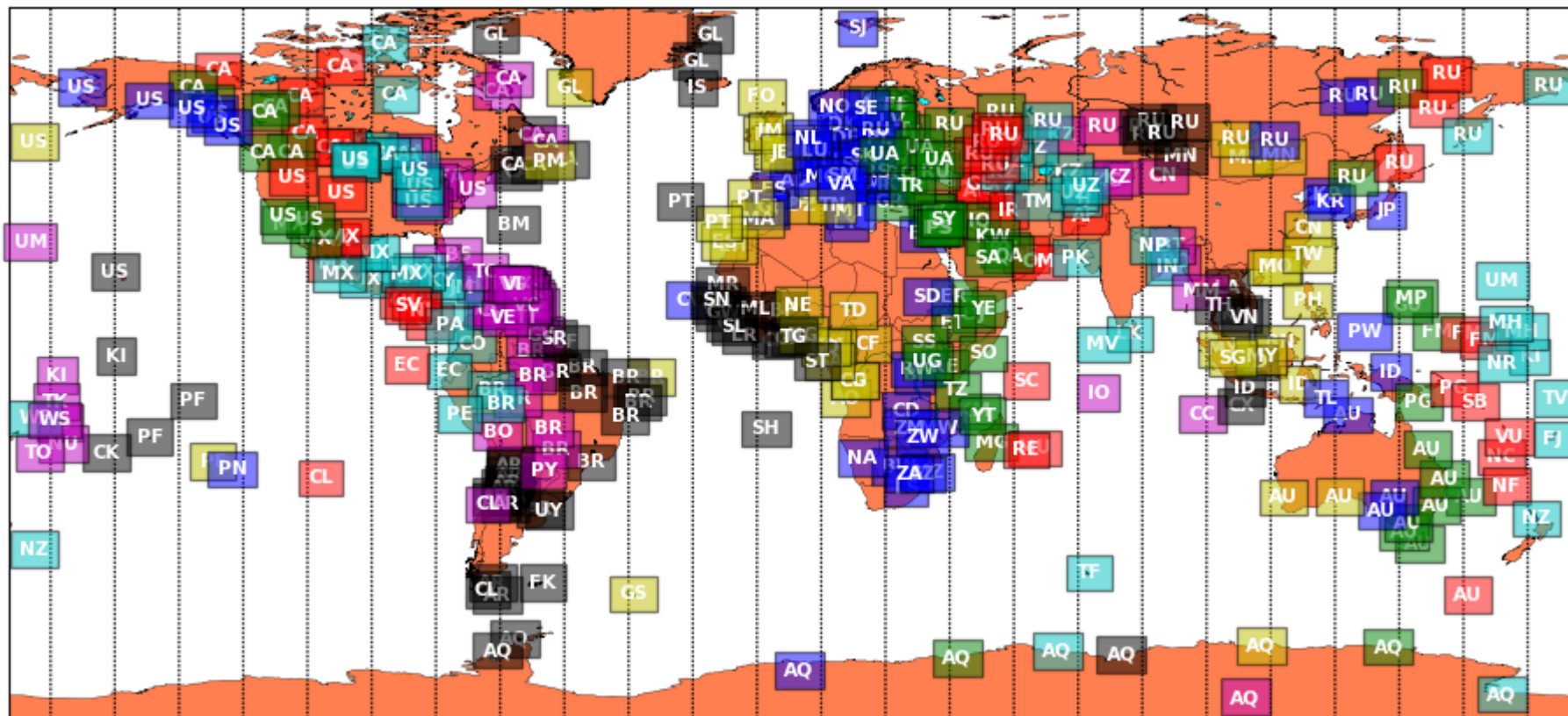
```
>>> time.monotonic_ns()                       # 60000000000    (Python 3.7+)
```





```
>>> import pytz
>>> len(pytz.common_timezones)
440
```

```
>>> import pytz
>>> len(pytz.common_timezones)
440
```



<https://www.iana.org/time-zones>

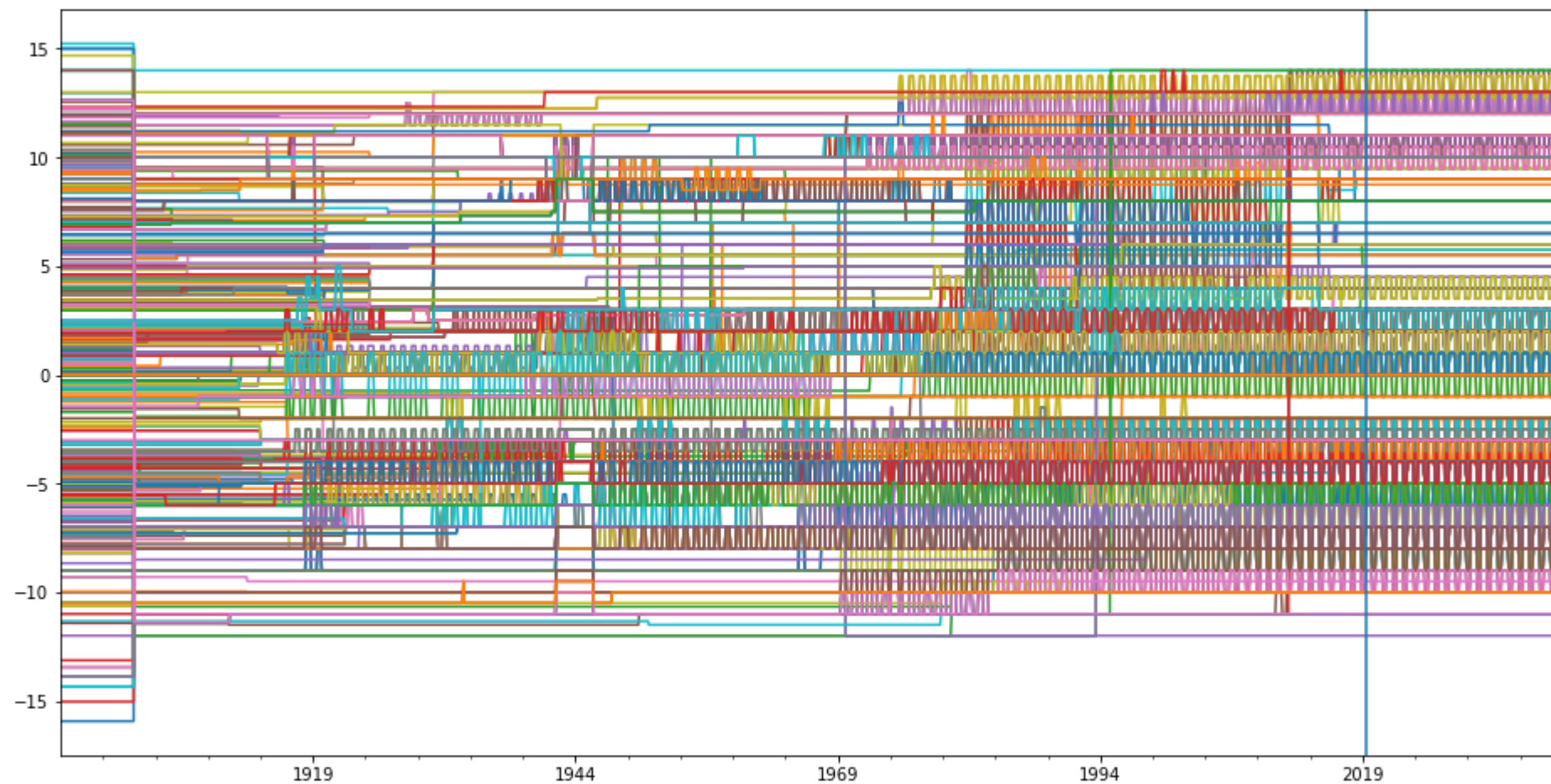
<https://www.iana.org/time-zones>

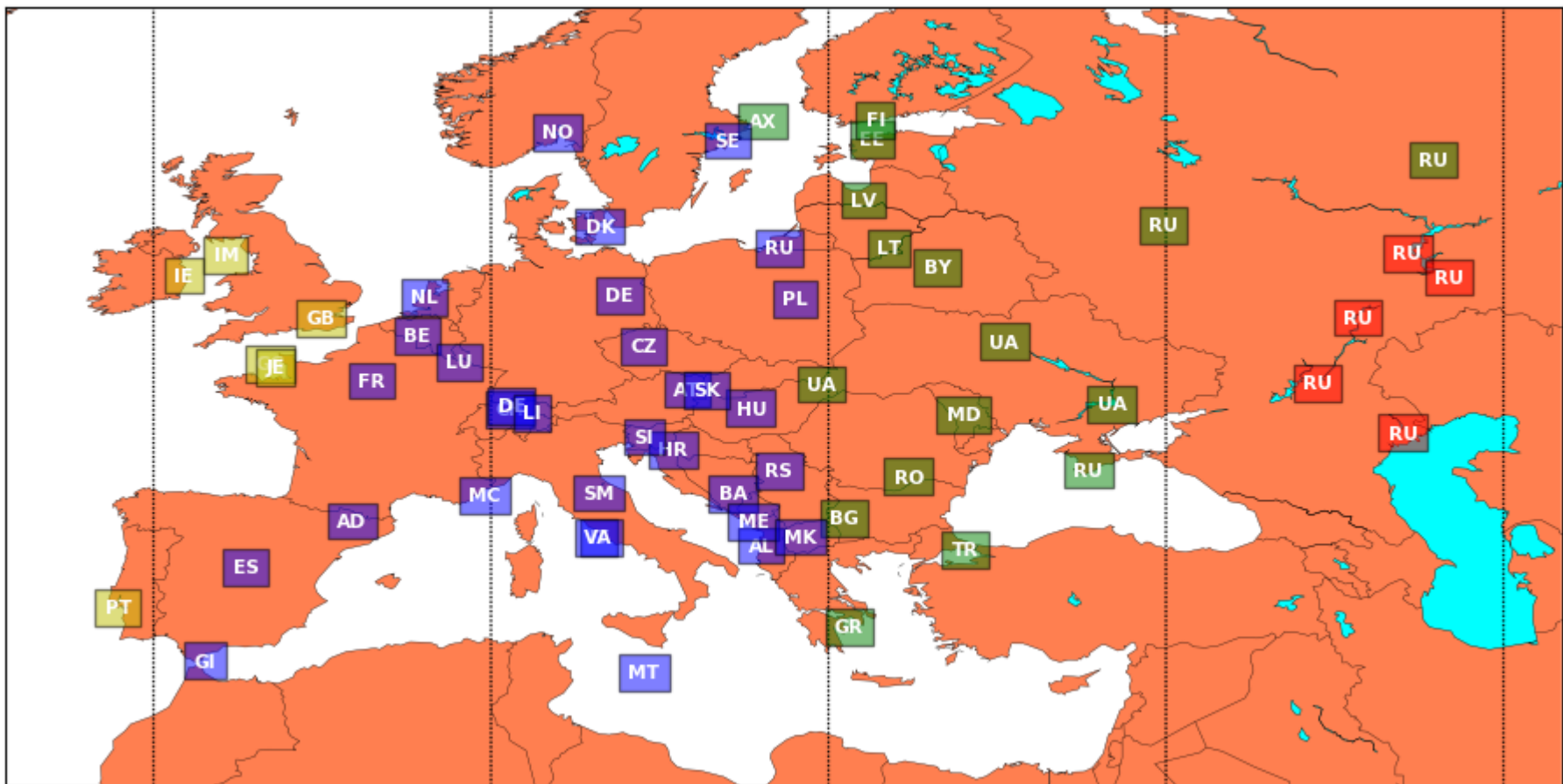
tzdata2019b.tar.gz (2019-07-01, 376kB)

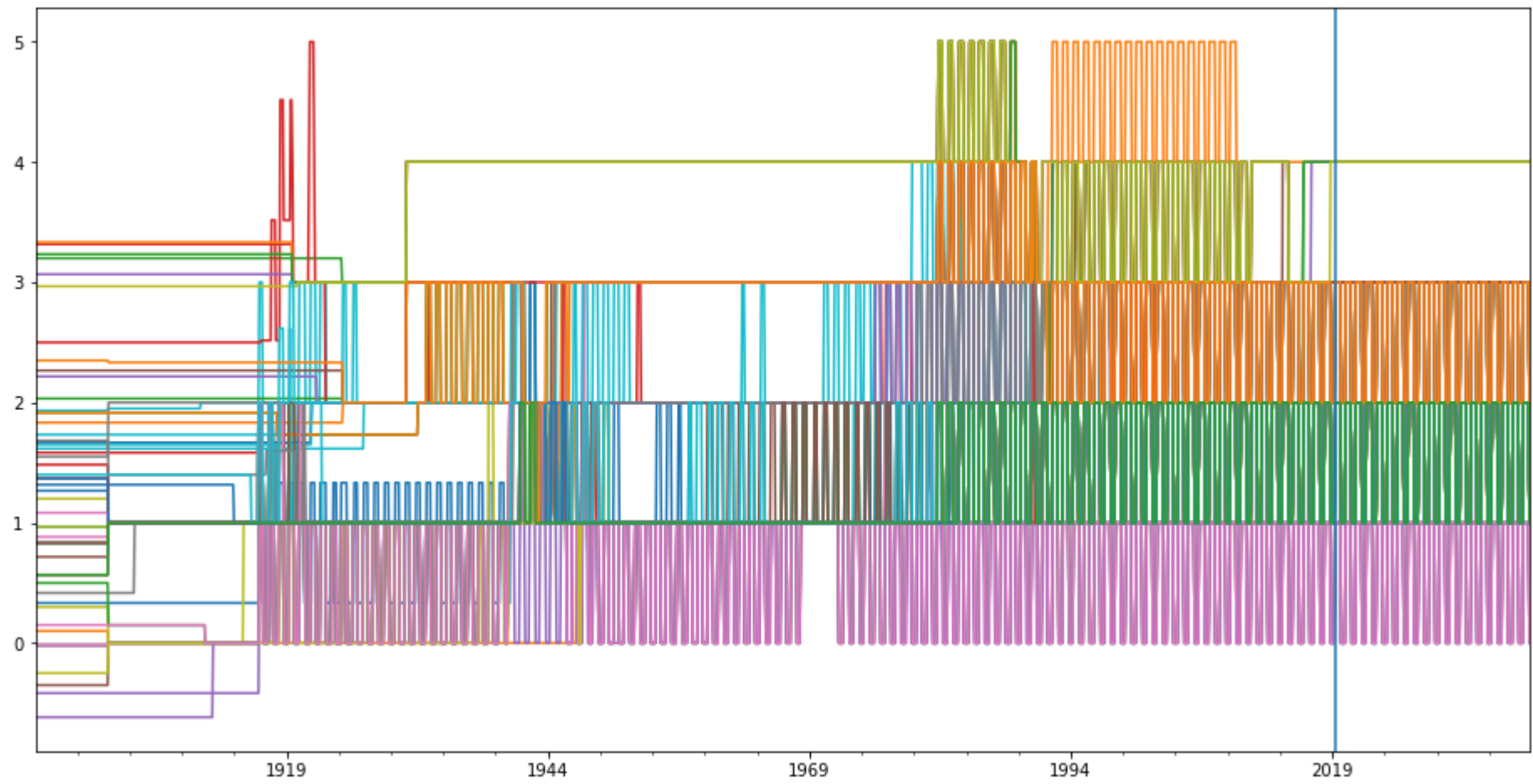
<https://www.iana.org/time-zones>

tzdata2019b.tar.gz (2019-07-01, 376kB)

```
60867 Jun 17 09:02 africa
12975 Jun 17 09:02 antarctica
161159 Jun 29 19:49 asia
90597 Jun 17 09:02 australasia
4606 Mar 8 20:28 backward
21969 Jun 17 09:02 backzone
5567 Oct 2 2017 calendars
1008 Jun 2 2017 checklinks.awk
4473 Jun 22 22:55 checktab.awk
3042 Oct 5 2018 CONTRIBUTING
2768 Mar 8 20:28 etcetera
172345 Jun 27 02:31 europe
404 Jun 17 09:02 factory
4463 Feb 20 00:30 iso3166.tab
2568 Jan 31 19:33 leapseconds
3645 Nov 10 2018 leapseconds.awk
10667 Jan 31 19:33 leap-seconds.list
252 May 25 2017 LICENSE
43192 Jul 1 09:06 Makefile
173668 Jul 1 09:11 NEWS
154701 Jun 27 02:31 northamerica
1249 Jun 17 09:02 pacificnew
2351 Feb 1 00:37 README
88328 Jun 17 09:02 southamerica
1594 Jun 17 09:02 systemv
57262 Jun 27 02:29 theory.html
6 Jul 1 09:11 version
753 Jul 16 2018 yearistype.sh
3694 Nov 1 2018 ziguard.awk
8446 May 17 00:18 zishrink.awk
17938 Jun 22 21:39 zone1970.tab
1453 Jun 17 09:02 zoneinfo2tdf.pl
19424 Jun 22 21:39 zone.tab
```









# Europe/Zurich

# Europe/Zurich

|      |               |         |       |       |             |
|------|---------------|---------|-------|-------|-------------|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 Jul 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 Jun    |
|      |               | 1:00    | Swiss | CE%ST | 1981        |
|      |               | 1:00    | EU    | CE%ST |             |

# Europe/Zurich

|      |               |         |       |       |             |
|------|---------------|---------|-------|-------|-------------|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 Jul 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 Jun    |
|      |               | 1:00    | Swiss | CE%ST | 1981        |
|      |               | 1:00    | EU    | CE%ST |             |

|      |       |      |      |   |     |        |      |      |   |
|------|-------|------|------|---|-----|--------|------|------|---|
| Rule | Swiss | 1941 | 1942 | - | May | Mon>=1 | 1:00 | 1:00 | S |
| Rule | Swiss | 1941 | 1942 | - | Oct | Mon>=1 | 2:00 | 0    | - |

# Europe/Zurich

|      |               |         |       |       |      |     |    |
|------|---------------|---------|-------|-------|------|-----|----|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 | Jul | 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 | Jun |    |
|      |               | 1:00    | Swiss | CE%ST | 1981 |     |    |
|      |               | 1:00    | EU    | CE%ST |      |     |    |

|      |       |      |      |   |     |        |      |      |   |
|------|-------|------|------|---|-----|--------|------|------|---|
| Rule | Swiss | 1941 | 1942 | - | May | Mon>=1 | 1:00 | 1:00 | S |
| Rule | Swiss | 1941 | 1942 | - | Oct | Mon>=1 | 2:00 | 0    | - |

|      |    |      |      |   |     |         |       |      |   |
|------|----|------|------|---|-----|---------|-------|------|---|
| Rule | EU | 1977 | 1980 | - | Apr | Sun>=1  | 1:00u | 1:00 | S |
| Rule | EU | 1977 | only | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1978 | only | - | Oct | 1       | 1:00u | 0    | - |
| Rule | EU | 1979 | 1995 | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1981 | max  | - | Mar | lastSun | 1:00u | 1:00 | S |
| Rule | EU | 1996 | max  | - | Oct | lastSun | 1:00u | 0    | - |

# Europe/Zurich

|      |               |         |       |       |      |     |    |
|------|---------------|---------|-------|-------|------|-----|----|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 | Jul | 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 | Jun |    |
|      |               | 1:00    | Swiss | CE%sT | 1981 |     |    |
|      |               | 1:00    | EU    | CE%sT |      |     |    |

|      |       |      |      |   |     |        |      |      |   |
|------|-------|------|------|---|-----|--------|------|------|---|
| Rule | Swiss | 1941 | 1942 | - | May | Mon>=1 | 1:00 | 1:00 | S |
| Rule | Swiss | 1941 | 1942 | - | Oct | Mon>=1 | 2:00 | 0    | - |

|      |    |      |      |   |     |         |       |      |   |
|------|----|------|------|---|-----|---------|-------|------|---|
| Rule | EU | 1977 | 1980 | - | Apr | Sun>=1  | 1:00u | 1:00 | S |
| Rule | EU | 1977 | only | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1978 | only | - | Oct | 1       | 1:00u | 0    | - |
| Rule | EU | 1979 | 1995 | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1981 | max  | - | Mar | lastSun | 1:00u | 1:00 | S |
| Rule | EU | 1996 | max  | - | Oct | lastSun | 1:00u | 0    | - |

|      |               |              |
|------|---------------|--------------|
| Link | Europe/Zurich | Europe/Vaduz |
|------|---------------|--------------|

# Europe/Zurich

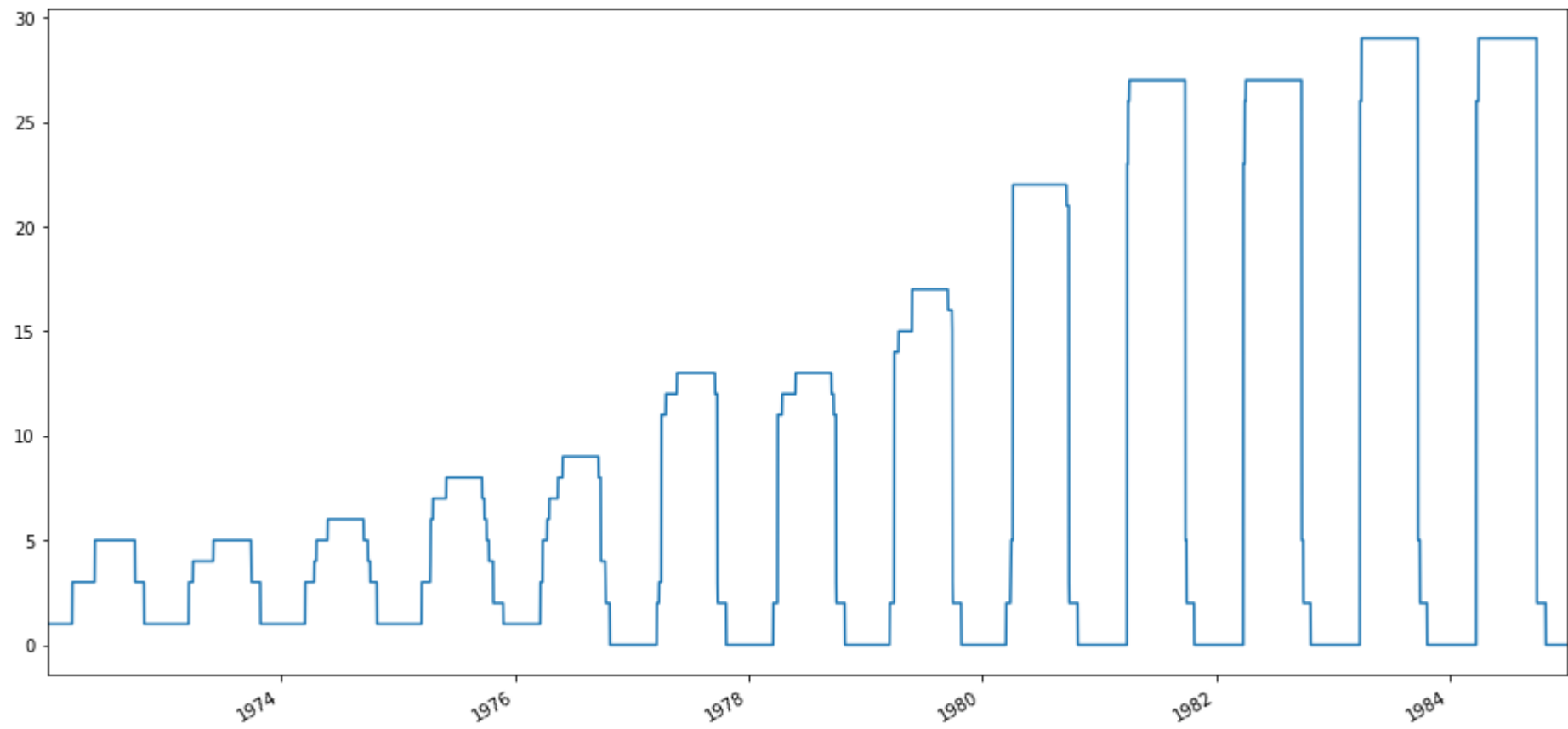
|      |               |         |       |       |      |     |    |
|------|---------------|---------|-------|-------|------|-----|----|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 | Jul | 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 | Jun |    |
|      |               | 1:00    | Swiss | CE%sT | 1981 |     |    |
|      |               | 1:00    | EU    | CE%sT |      |     |    |

|      |       |      |      |   |     |        |      |      |   |
|------|-------|------|------|---|-----|--------|------|------|---|
| Rule | Swiss | 1941 | 1942 | - | May | Mon>=1 | 1:00 | 1:00 | S |
| Rule | Swiss | 1941 | 1942 | - | Oct | Mon>=1 | 2:00 | 0    | - |

|      |    |      |      |   |     |         |       |      |   |
|------|----|------|------|---|-----|---------|-------|------|---|
| Rule | EU | 1977 | 1980 | - | Apr | Sun>=1  | 1:00u | 1:00 | S |
| Rule | EU | 1977 | only | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1978 | only | - | Oct | 1       | 1:00u | 0    | - |
| Rule | EU | 1979 | 1995 | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1981 | max  | - | Mar | lastSun | 1:00u | 1:00 | S |
| Rule | EU | 1996 | max  | - | Oct | lastSun | 1:00u | 0    | - |

|      |               |              |
|------|---------------|--------------|
| Link | Europe/Zurich | Europe/Vaduz |
|------|---------------|--------------|

|      |               |                 |
|------|---------------|-----------------|
| Link | Europe/Zurich | Europe/Busingen |
|------|---------------|-----------------|



|      |               |         |            |       |             |      |
|------|---------------|---------|------------|-------|-------------|------|
| Zone | Europe/Berlin | 0:53:28 | -          | LMT   | 1893 Apr    |      |
|      |               | 1:00    | C-Eur      | CE%sT | 1945 May 24 | 2:00 |
|      |               | 1:00    | SovietZone | CE%sT | 1946        |      |
|      |               | 1:00    | Germany    | CE%sT | 1980        |      |
|      |               | 1:00    | EU         | CE%sT |             |      |



|      |               |         |            |       |             |      |
|------|---------------|---------|------------|-------|-------------|------|
| Zone | Europe/Berlin | 0:53:28 | -          | LMT   | 1893 Apr    |      |
|      |               | 1:00    | C-Eur      | CE%ST | 1945 May 24 | 2:00 |
|      |               | 1:00    | SovietZone | CE%ST | 1946        |      |
|      |               | 1:00    | Germany    | CE%ST | 1980        |      |
|      |               | 1:00    | EU         | CE%ST |             |      |

|      |              |         |        |       |             |                 |
|------|--------------|---------|--------|-------|-------------|-----------------|
| Zone | Europe/Paris | 0:09:21 | -      | LMT   | 1891 Mar 15 | 0:01            |
|      |              | 0:09:21 | -      | PMT   | 1911 Mar 11 | 0:01 # Paris MT |
|      |              | 0:00    | France | WE%ST | 1940 Jun 14 | 23:00           |
|      |              | 1:00    | C-Eur  | CE%ST | 1944 Aug 25 |                 |
|      |              | 0:00    | France | WE%ST | 1945 Sep 16 | 3:00            |
|      |              | 1:00    | France | CE%ST | 1977        |                 |
|      |              | 1:00    | EU     | CE%ST |             |                 |

|      |               |         |            |       |             |      |
|------|---------------|---------|------------|-------|-------------|------|
| Zone | Europe/Berlin | 0:53:28 | -          | LMT   | 1893 Apr    |      |
|      |               | 1:00    | C-Eur      | CE%sT | 1945 May 24 | 2:00 |
|      |               | 1:00    | SovietZone | CE%sT | 1946        |      |
|      |               | 1:00    | Germany    | CE%sT | 1980        |      |
|      |               | 1:00    | EU         | CE%sT |             |      |

|      |              |         |        |       |             |                 |
|------|--------------|---------|--------|-------|-------------|-----------------|
| Zone | Europe/Paris | 0:09:21 | -      | LMT   | 1891 Mar 15 | 0:01            |
|      |              | 0:09:21 | -      | PMT   | 1911 Mar 11 | 0:01 # Paris MT |
|      |              | 0:00    | France | WE%sT | 1940 Jun 14 | 23:00           |
|      |              | 1:00    | C-Eur  | CE%sT | 1944 Aug 25 |                 |
|      |              | 0:00    | France | WE%sT | 1945 Sep 16 | 3:00            |
|      |              | 1:00    | France | CE%sT | 1977        |                 |
|      |              | 1:00    | EU     | CE%sT |             |                 |

# Amsterdam Mean Time was +00:19:32.13, but the .13 is omitted

# below because the current format requires STDOFF to be an integer.

|      |                  |         |       |             |             |      |
|------|------------------|---------|-------|-------------|-------------|------|
| Zone | Europe/Amsterdam | 0:19:32 | -     | LMT         | 1835        |      |
|      |                  | 0:19:32 | Neth  | %s          | 1937 Jul 1  |      |
|      |                  | 0:20    | Neth  | +0020/+0120 | 1940 May 16 | 0:00 |
|      |                  | 1:00    | C-Eur | CE%sT       | 1945 Apr 2  | 2:00 |
|      |                  | 1:00    | Neth  | CE%sT       | 1977        |      |
|      |                  | 1:00    | EU    | CE%sT       |             |      |

## 213.

### Vládní nařízení

ze dne **27. listopadu 1946**

o zavedení zimního času v období 1946/1947.

Vláda republiky Československé nařizuje podle § 1 zákona ze dne 21. listopadu 1946, č. 212 Sb., o zimním čase:

#### § 1.

Počátek zimního času v roce 1946 se určuje na den **1. prosince 1946** o třetí hodině ranní středoevropského času a provede se posunutím hodinových ručiček na druhou hodinu.

#### § 2.

Konec zimního času v roce 1947 se určuje na den **23. února 1947** o druhé hodině ranní zimního času a provede se posunutím hodinových ručiček na třetí hodinu.

# Europe/Istanbul

|      |                 |               |                                   |
|------|-----------------|---------------|-----------------------------------|
| Link | Europe/Istanbul | Asia/Istanbul | # Istanbul is in both continents. |
|------|-----------------|---------------|-----------------------------------|

# Europe/Istanbul

Link    Europe/Istanbul    Asia/Istanbul    # Istanbul is in both continents.

|      |                 |         |        |         |      |     |    |                     |
|------|-----------------|---------|--------|---------|------|-----|----|---------------------|
| Zone | Europe/Istanbul | 1:55:52 | -      | LMT     | 1880 |     |    |                     |
|      |                 | 1:56:56 | -      | IMT     | 1910 | Oct | #  | Istanbul Mean Time? |
|      |                 | 2:00    | Turkey | EE%sT   | 1978 | Oct | 15 |                     |
|      |                 | 3:00    | Turkey | +03/+04 | 1985 | Apr | 20 |                     |
|      |                 | 2:00    | Turkey | EE%sT   | 2007 |     |    |                     |
|      |                 | 2:00    | EU     | EE%sT   | 2011 | Mar | 27 | 1:00u               |
|      |                 | 2:00    | -      | EET     | 2011 | Mar | 28 | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2014 | Mar | 30 | 1:00u               |
|      |                 | 2:00    | -      | EET     | 2014 | Mar | 31 | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2015 | Oct | 25 | 1:00u               |
|      |                 | 2:00    | 1:00   | EEST    | 2015 | Nov | 8  | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2016 | Sep | 7  |                     |
|      |                 | 3:00    | -      | +03     |      |     |    |                     |

# Europe/Istanbul

Link    Europe/Istanbul    Asia/Istanbul    # Istanbul is in both continents.

|      |                 |         |        |         |      |     |    |                     |
|------|-----------------|---------|--------|---------|------|-----|----|---------------------|
| Zone | Europe/Istanbul | 1:55:52 | -      | LMT     | 1880 |     |    |                     |
|      |                 | 1:56:56 | -      | IMT     | 1910 | Oct | #  | Istanbul Mean Time? |
|      |                 | 2:00    | Turkey | EE%sT   | 1978 | Oct | 15 |                     |
|      |                 | 3:00    | Turkey | +03/+04 | 1985 | Apr | 20 |                     |
|      |                 | 2:00    | Turkey | EE%sT   | 2007 |     |    |                     |
|      |                 | 2:00    | EU     | EE%sT   | 2011 | Mar | 27 | 1:00u               |
|      |                 | 2:00    | -      | EET     | 2011 | Mar | 28 | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2014 | Mar | 30 | 1:00u               |
|      |                 | 2:00    | -      | EET     | 2014 | Mar | 31 | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2015 | Oct | 25 | 1:00u               |
|      |                 | 2:00    | 1:00   | EEST    | 2015 | Nov | 8  | 1:00u               |
|      |                 | 2:00    | EU     | EE%sT   | 2016 | Sep | 7  |                     |
|      |                 | 3:00    | -      | +03     |      |     |    |                     |

(2011-03-10): [...] Turkey will change into summer time zone (GMT+3) on March 28, 2011 at 3:00 a.m. instead of March 27. This change is due to a nationwide exam on 27th. [URL] Turkish: [URL]

|      |    |       |             |       |
|------|----|-------|-------------|-------|
| 2:00 | EU | EE%sT | 2014 Mar 30 | 1:00u |
| 2:00 | -  | EET   | 2014 Mar 31 | 1:00u |

[...] (2014-02-14): The DST for Turkey has been changed for this year because of the Turkish Local election.... [URL] ... so Turkey will move clocks forward one hour on March 31 at 3:00 a.m.

[...] (2014-04-15): Having landed on a flight from the states to Istanbul (via AMS) on March 31, I can tell you that NOBODY (even the airlines) respected this timezone DST change delay. Maybe the word just didn't get out in time.

[...] (2014-06-15): The press reported massive confusion, as election officials obeyed the rule change but cell phones (and airline baggage systems) did not. See: [URL from 2014-03-30] I guess the best we can do is document the official time.

|      |      |       |             |       |
|------|------|-------|-------------|-------|
| 2:00 | EU   | EE%sT | 2015 Oct 25 | 1:00u |
| 2:00 | 1:00 | EEST  | 2015 Nov 8  | 1:00u |

[...] (2015-09-29): It's officially announced now by the Ministry of Energy. Turkey delays winter time to 8th of November 04:00 [URL]

BBC News (2015-10-25): Confused Turks are asking "what's the time?" after automatic clocks defied a government decision ... "For the next two weeks #Turkey is on EEST... Erdogan Engineered Standard Time," said Twitter user @aysekarahasan. [URL]



|      |    |       |            |
|------|----|-------|------------|
| 2:00 | EU | EE%sT | 2016 Sep 7 |
| 3:00 | -  | +03   |            |

[...] (2016-09-08): Turkey will stay in Daylight Saving Time even in winter.... [URL]

[...] (2016-09-07): The change is permanent, so this is the new standard time in Turkey. It takes effect today, which is not much notice.

[...] (2017-10-28): Turkey will go back to Daylight Saving Time starting 2018-10. [URL]

[...] (2017-11-08): ... today it was announced that the DST will become "continuous": [URL]

[...] (2017-11-08): Although Google Translate misfires on that source, it looks like Turkey reversed last month's decision, and so will stay at +03.

# America/Caracas

|      |                 |          |   |       |             |   |         |      |       |
|------|-----------------|----------|---|-------|-------------|---|---------|------|-------|
| Zone | America/Caracas | -4:27:44 | - | LMT   | 1890        |   |         |      |       |
|      |                 | -4:27:40 | - | CMT   | 1912 Feb 12 | # | Caracas | Mean | Time? |
|      |                 | -4:30    | - | -0430 | 1965 Jan 1  |   | 0:00    |      |       |
|      |                 | -4:00    | - | -04   | 2007 Dec 9  |   | 3:00    |      |       |
|      |                 | -4:30    | - | -0430 | 2016 May 1  |   | 2:30    |      |       |
|      |                 | -4:00    | - | -04   |             |   |         |      |       |

[...] (2016-04-15): Clocks advance 30 minutes on 2016-05-01 at 02:30.... [...] [URL from Reuters]

[...] (2016-04-20): ... published in the official Gazette [2016-04-18], here: [URL from .ve]

# America/Port-au-Prince

|      |       |      |      |   |     |         |      |      |   |
|------|-------|------|------|---|-----|---------|------|------|---|
| Rule | Haiti | 2005 | 2006 | - | Apr | Sun>=1  | 0:00 | 1:00 | D |
| Rule | Haiti | 2005 | 2006 | - | Oct | lastSun | 0:00 | 0    | S |
| Rule | Haiti | 2012 | 2015 | - | Mar | Sun>=8  | 2:00 | 1:00 | D |
| Rule | Haiti | 2012 | 2015 | - | Nov | Sun>=1  | 2:00 | 0    | S |
| Rule | Haiti | 2017 | max  | - | Mar | Sun>=8  | 2:00 | 1:00 | D |
| Rule | Haiti | 2017 | max  | - | Nov | Sun>=1  | 2:00 | 0    | S |

[...] (2005-04-15) [...] wrote me that Haiti is now on DST. I searched for confirmation, and I found a press release on the Web page of the Haitian Consulate in Chicago (2005-03-31), [...]

[...] (2006-04-04) I have been informed by users that Haiti observes DST this year like last year [...]

[...] (2012-03-11) According to several news sources, Haiti will observe DST this year, apparently using the same start and end date as USA/Canada. [...]

[...] (2013-03-10) It appears that Haiti is observing DST this year as well, same rules as US/Canada. They did it last year as well, and it looks like they are going to observe DST every year now... [...]

[...] (2016-03-12) [...] informed us that Haiti are not going on DST this year. [...]

[...] (2017-03-12) We have received 4 mails from different people telling that Haiti has started DST again today, and this source seems to confirm that, I have not been able to find a more authoritative source: [URL]

# Asia/Seoul, Asia/Pyongyang

|      |            |         |     |      |             |
|------|------------|---------|-----|------|-------------|
| Zone | Asia/Seoul | 8:27:52 | -   | LMT  | 1908 Apr 1  |
|      |            | 8:30    | -   | KST  | 1912 Jan 1  |
|      |            | 9:00    | -   | JST  | 1945 Sep 8  |
|      |            | 9:00    | -   | KST  | 1954 Mar 21 |
|      |            | 8:30    | ROK | K%ST | 1961 Aug 10 |
|      |            | 9:00    | ROK | K%ST |             |

|      |                |         |   |     |                   |
|------|----------------|---------|---|-----|-------------------|
| Zone | Asia/Pyongyang | 8:23:00 | - | LMT | 1908 Apr 1        |
|      |                | 8:30    | - | KST | 1912 Jan 1        |
|      |                | 9:00    | - | JST | 1945 Aug 24       |
|      |                | 9:00    | - | KST | 2015 Aug 15 00:00 |
|      |                | 8:30    | - | KST | 2018 May 4 23:30  |
|      |                | 9:00    | - | KST |                   |

## Asia/Seoul, Asia/Pyongyang

|      |            |         |     |      |             |      |                |         |   |     |                   |
|------|------------|---------|-----|------|-------------|------|----------------|---------|---|-----|-------------------|
| Zone | Asia/Seoul | 8:27:52 | -   | LMT  | 1908 Apr 1  | Zone | Asia/Pyongyang | 8:23:00 | - | LMT | 1908 Apr 1        |
|      |            | 8:30    | -   | KST  | 1912 Jan 1  |      |                | 8:30    | - | KST | 1912 Jan 1        |
|      |            | 9:00    | -   | JST  | 1945 Sep 8  |      |                | 9:00    | - | JST | 1945 Aug 24       |
|      |            | 9:00    | -   | KST  | 1954 Mar 21 |      |                | 9:00    | - | KST | 2015 Aug 15 00:00 |
|      |            | 8:30    | ROK | K%ST | 1961 Aug 10 |      |                | 8:30    | - | KST | 2018 May 4 23:30  |
|      |            | 9:00    | ROK | K%ST |             |      |                | 9:00    | - | KST |                   |

[...] (2015-08-07) According to many news sources, North Korea is going to change to the 8:30 time zone on August 15

[...] (2015-08-15) Bells rang out midnight (00:00) Friday as part of the celebrations. [...]

## Asia/Seoul, Asia/Pyongyang

|      |            |         |     |      |             |      |                |         |   |     |                   |
|------|------------|---------|-----|------|-------------|------|----------------|---------|---|-----|-------------------|
| Zone | Asia/Seoul | 8:27:52 | -   | LMT  | 1908 Apr 1  | Zone | Asia/Pyongyang | 8:23:00 | - | LMT | 1908 Apr 1        |
|      |            | 8:30    | -   | KST  | 1912 Jan 1  |      |                | 8:30    | - | KST | 1912 Jan 1        |
|      |            | 9:00    | -   | JST  | 1945 Sep 8  |      |                | 9:00    | - | JST | 1945 Aug 24       |
|      |            | 9:00    | -   | KST  | 1954 Mar 21 |      |                | 9:00    | - | KST | 2015 Aug 15 00:00 |
|      |            | 8:30    | ROK | K%ST | 1961 Aug 10 |      |                | 8:30    | - | KST | 2018 May 4 23:30  |
|      |            | 9:00    | ROK | K%ST |             |      |                | 9:00    | - | KST |                   |

[...] (2015-08-07) According to many news sources, North Korea is going to change to the 8:30 time zone on August 15

[...] (2015-08-15) Bells rang out midnight (00:00) Friday as part of the celebrations. [...]

[...] (2018-04-29) North Korea will revert its time zone from UTC+8:30 (PYT; Pyongyang Time) back to UTC+9 (KST; Korea Standard Time).

[...] (2018-04-30) [...] It appears to be the front page story at the top in the right-most column.



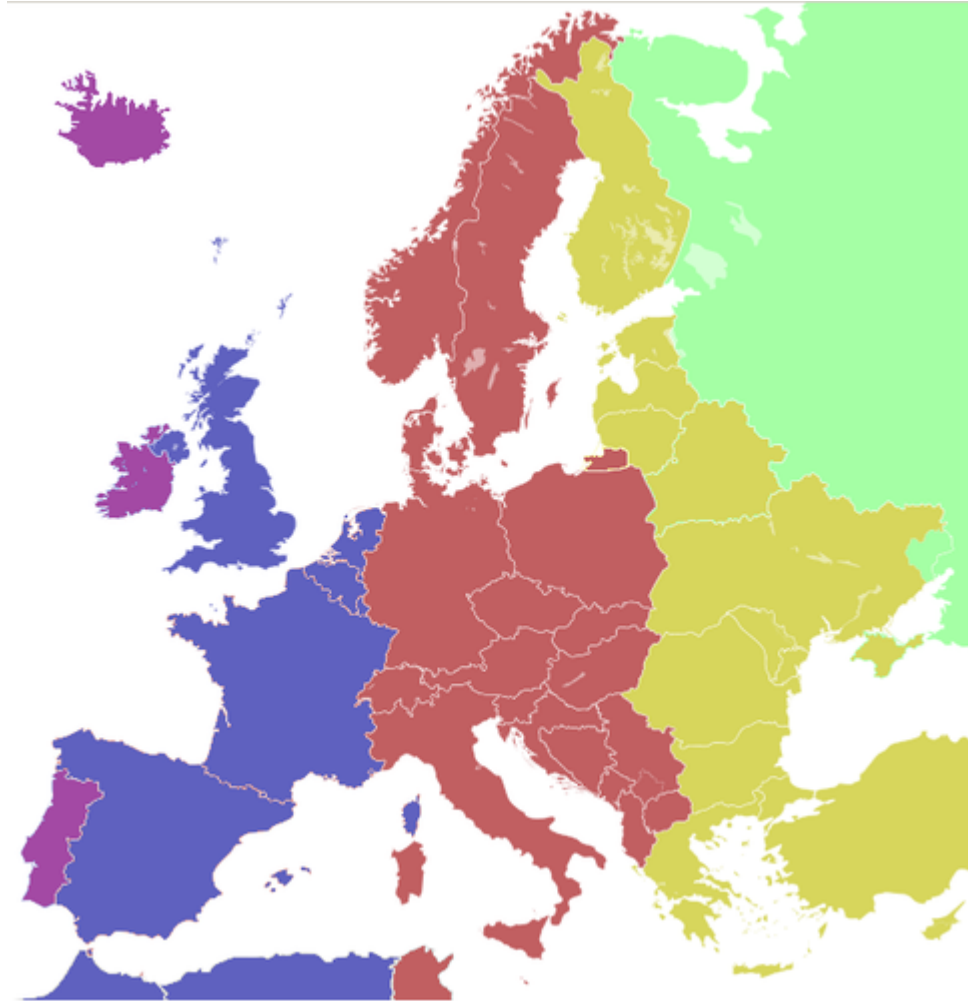
© EuroPython 2019 Participants

<https://www.iana.org/time-zones>

tzdata2019b.tar.gz (2019-07-01, 376kB)

```
60867 Jun 17 09:02 africa
12975 Jun 17 09:02 antarctica
161159 Jun 29 19:49 asia
90597 Jun 17 09:02 australasia
4606 Mar 8 20:28 backward
21969 Jun 17 09:02 backzone
5567 Oct 2 2017 calendars
1008 Jun 2 2017 checklinks.awk
4473 Jun 22 22:55 checktab.awk
3042 Oct 5 2018 CONTRIBUTING
2768 Mar 8 20:28 etcetera
172345 Jun 27 02:31 europe
404 Jun 17 09:02 factory
4463 Feb 20 00:30 iso3166.tab
2568 Jan 31 19:33 leapseconds
3645 Nov 10 2018 leapseconds.awk
10667 Jan 31 19:33 leap-seconds.list
252 May 25 2017 LICENSE
43192 Jul 1 09:06 Makefile
173668 Jul 1 09:11 NEWS
154701 Jun 27 02:31 northamerica
1249 Jun 17 09:02 pacificnew
2351 Feb 1 00:37 README
88328 Jun 17 09:02 southamerica
1594 Jun 17 09:02 systemv
57262 Jun 27 02:29 theory.html
6 Jul 1 09:11 version
753 Jul 16 2018 yearistype.sh
3694 Nov 1 2018 ziguard.awk
8446 May 17 00:18 zishrink.awk
17938 Jun 22 21:39 zone1970.tab
1453 Jun 17 09:02 zoneinfo2tdf.pl
19424 Jun 22 21:39 zone.tab
```





**Europe after 2021?**

# Europe/Zurich

|      |               |         |       |       |      |        |
|------|---------------|---------|-------|-------|------|--------|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 | Jul 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 | Jun    |
|      |               | 1:00    | Swiss | CE%sT | 1981 |        |
|      |               | 1:00    | EU    | CE%sT |      |        |

|      |    |      |      |   |     |         |       |      |   |
|------|----|------|------|---|-----|---------|-------|------|---|
| Rule | EU | 1977 | 1980 | - | Apr | Sun>=1  | 1:00u | 1:00 | S |
| Rule | EU | 1977 | only | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1978 | only | - | Oct | 1       | 1:00u | 0    | - |
| Rule | EU | 1979 | 1995 | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1981 | max  | - | Mar | lastSun | 1:00u | 1:00 | S |
| Rule | EU | 1996 | max  | - | Oct | lastSun | 1:00u | 0    | - |

# Europe/Zurich

|      |               |         |       |       |      |        |
|------|---------------|---------|-------|-------|------|--------|
| Zone | Europe/Zurich | 0:34:08 | -     | LMT   | 1853 | Jul 16 |
|      |               | 0:29:46 | -     | BMT   | 1894 | Jun    |
|      |               | 1:00    | Swiss | CE%sT | 1981 |        |
|      |               | 1:00    | EU    | CE%sT |      |        |

|      |    |      |      |   |     |         |       |      |   |
|------|----|------|------|---|-----|---------|-------|------|---|
| Rule | EU | 1977 | 1980 | - | Apr | Sun>=1  | 1:00u | 1:00 | S |
| Rule | EU | 1977 | only | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1978 | only | - | Oct | 1       | 1:00u | 0    | - |
| Rule | EU | 1979 | 1995 | - | Sep | lastSun | 1:00u | 0    | - |
| Rule | EU | 1981 | 2021 | - | Mar | lastSun | 1:00u | 1:00 | S |
| Rule | EU | 1996 | 2021 | - | Oct | lastSun | 1:00u | 0    | - |

# Best practices

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Miroslav Šedivý

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