Date and Time Features

1. Date and Time variables

* Date only
* Time only
* Date and time

1. Features from date part

* Day
* Day of month
* Day of week
* Is weekend
* Month
* 1 to 12
* Quarter
* Semester
* Year
* Date
* First / last of year
* First / last of quarter
* Leap year
* Week of year

1. Features from time part

* Hour
* Minutes
* Seconds
* Microsecond
* Nanosecond
* Time zones (UTC)

1. Pandas dt module
2. Feature-engine transformer

Periodic or Cyclical Features

1. Periodic features

* Repeat their values at regular intervals
* Time examples: hour, days of week, week of year, months, quarter, semester, seasons
* Other features: tides, moon cycle, position in an orbit
* Also known as Cyclical features:
* Values that are very different in magnitude are actually closer to each other
* Hour: 1 is closer to 23 than to 6
* Month: Dec is closer to Jan than July

1. Trigonometric functions

* Periodic functions
* The sine and cosine functions repeat their values at intervals of radians

1. Periodic transformation

* To transform the cyclical features

1. Advantage

* When we transform the hours with the sine, the hours 0 and 22 are much closer in the value

1. Limitation

* Different hours could take the same value after the transformation

1. Both features to fully encode the original

* With the 2 functions together we can unequivocally identify each hour