# What is an Approximation?

Approximation types, Approximated project, Metric approximation

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An approximation is an effective and handy tool that collects average or sum data (data that is grouped into subsets and time categories). It helps to analyze and compare different data layers. It is quite useful when we need to analyze Metrics with different temporal parameters in one project (different chronological periods of time or data with different time precision), or when we need to compare data with average or sum values. Approximation could be applied to a particular Metric or to the whole project.
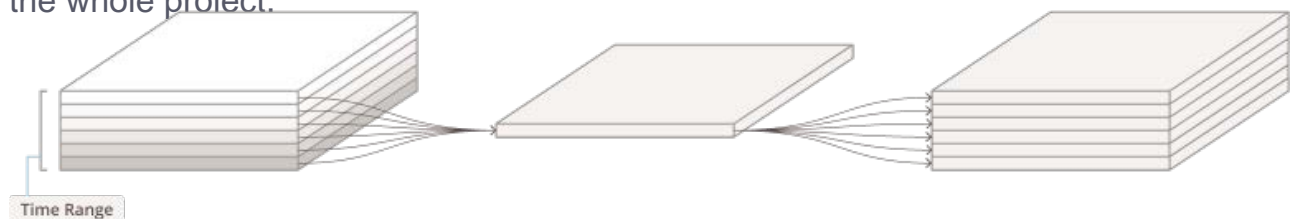
There are four types of approximation in Chronotope: **Day of all days, Day of week, Day of month, Month of year.** Note that for approximated projects, only Day of all days approximation type is currently available.

Day of all days	Day of week	Day of month	Month of year
January 2016	**January 2016**	**2016**	**2015**
Mon Tue Wed Thu Fri Sat Sun	Mon Tue Wed Thu Fri Sat Sun	Jan Feb Mar Apr May Jun	Jan Feb Mar Apr May Jun
Approximated day of all days	**Approximated day of week**	**Approximated day of month**	**Approximated month of year**
Mon Tue Wed Thu Fri Sat Sun	Mon Tue Wed Thu Fri Sat Sun	Jan Feb Mar Apr May Jun	Jan Feb Mar Apr May Jun
February 2016	**February 2016**	**2016**	**2016**
Mon Tue Wed Thu Fri Sat Sun	Mon Tue Wed Thu Fri Sat Sun	Jul Aug Sep Oct Nov Dec	Jan Feb Mar Apr May Jun

1. **Day of all days** — All days in selected time intervals of the dataset will be approximated into one common day. Basic approximated time range: *common day*.

2. **Day of week** — All days in selected time intervals of the dataset will be approximated into several days according to the day of the week (Monday to Sunday). Basic approximated time range: *common week*. That means, for example, the approximated Monday is a sum or average of all Mondays in selected time intervals.

3. **Day of month** — All days in the selected time intervals of the dataset will be approximated into several days according to the day of the month (from 1st to 31st). Basic approximated time range: *common month*. That means, for example, the approximated first day of the month is a sum or average of all first days of each month in selected time intervals.

4. **Month of year** — All days in selected time intervals of the dataset will be approximated into several days according to the month of the year (January to December). Basic approximated time range: *common year*. It means that all days of the particular month of the year will be approximated into one common slice. The new approximated month consists of the repetition of this slice.

The approximation process requires the following steps:

- **Project time range** and **slice duration** settings. Initially, project time range is

defined through one of the approximation types (described above) and can be adjusted to meet particular needs. The time constraints for the project is basically a container where data will be approximated in.

- **Time interval(s)** selection. Data from the selected time intervals will be approximated into previously selected time range (container).
- **Approximation settings**. This flow is relevant for both approximated project creation and Metric approximation inside a regular project.

Approximated project

There are two types of projects in Chronotope: **regular** and **approximated.** Project creation consists of the same basic steps, though slightly different for different types of projects.

Project primary settings
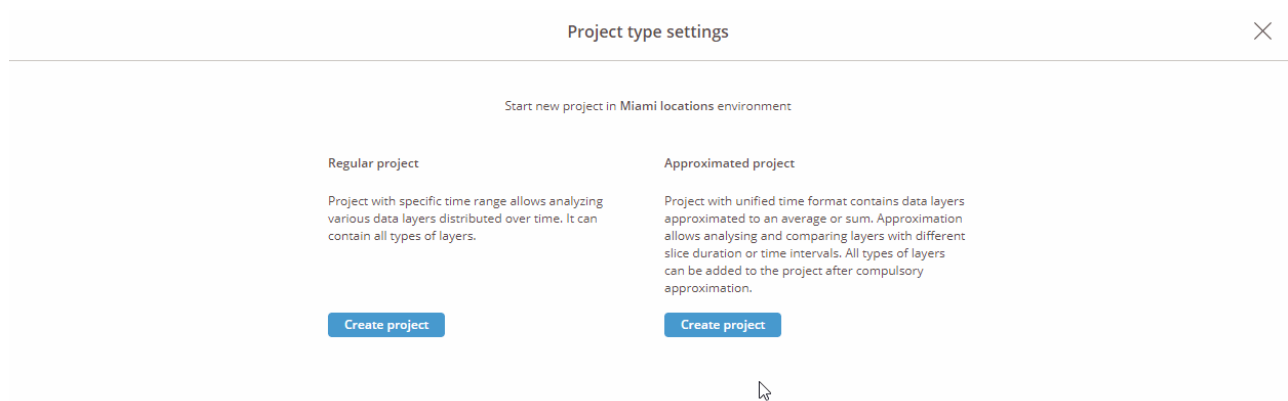
After project type selection, you will be transferred to the **Approximated calendar**. Here you can choose approximation type, slice duration, and project time interval.

The approximated calendar works with a limited amount of slices, defined by approximation type (upper tabs). Now only **Day of all days** type is available. You'll see slices for one day represented with by **wave**. It can consist of one slice (if Day range filter is not applied) or divided into several slices according to selected slice duration (from 5 minutes to 12 hours).

Metric adding

Regular Metrics can be added to the project as well as approximated ones, but they will be approximated by default. There are three cases for Metric adding:

1. Add already approximated Metric: Settings of the Metric correlate with project settings — Metric will be added after approximation settings.
2. Add already approximated Metric: Settings of the Metric *don't* correlate with project settings — Metric will be approximated into one slice according to project settings.
3. Add regular Metric — Metric will be added after approximation settings.

Regular Metric contains absolute time data. Therefore, the calendar for adding a regular Metric looks like the regular project's one, and its structure is the same, excluding the settings section.
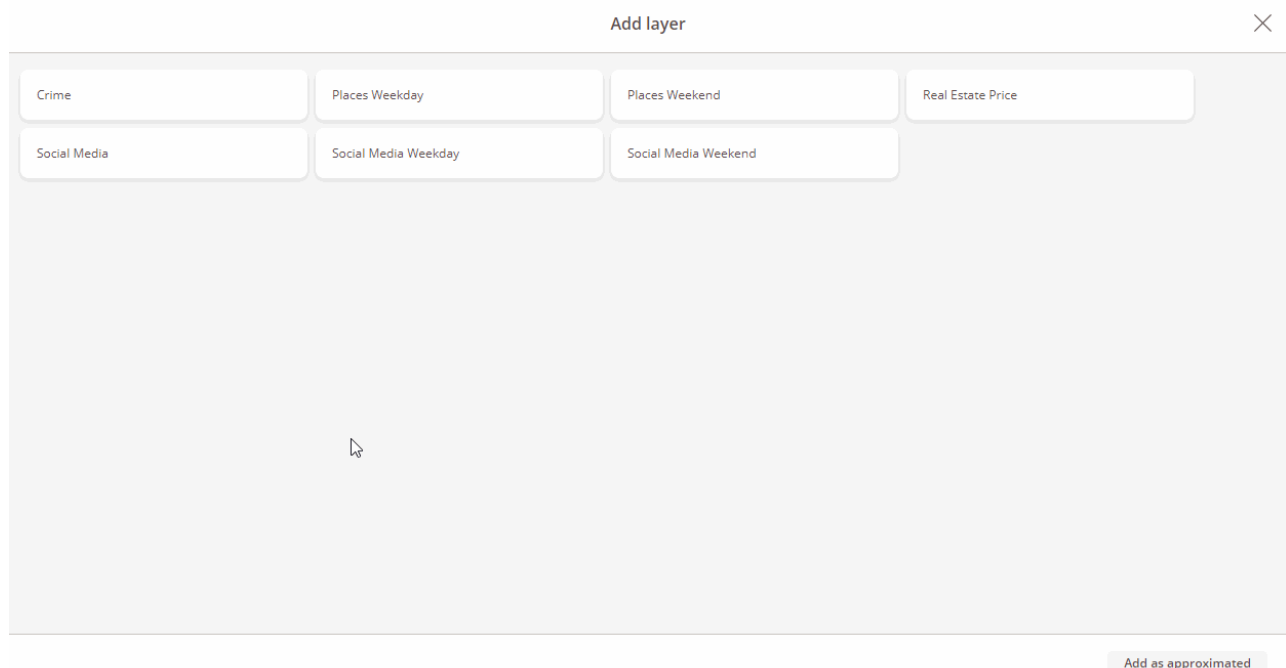
First, it is necessary to select time interval(s) which will be approximated to the project time range. Second, approximation should be set through:

- **Aggregation Function**: Sum or average — Choose a function for approximation, whether you want to collapse slices into average or total one.
- **Slice type** (for Metrics with slice duration less than a day): Unique slices or

uniform slice. This option defines how to approximate slices inside one day.

1. **Unique slices** — Each slice inside a day will be approximated with corresponding slices of other days.
2. **Uniform slices** — All slices inside a day will be approximated into one common slice.

After all these settings, new Metric will be added to the project.

Regular project
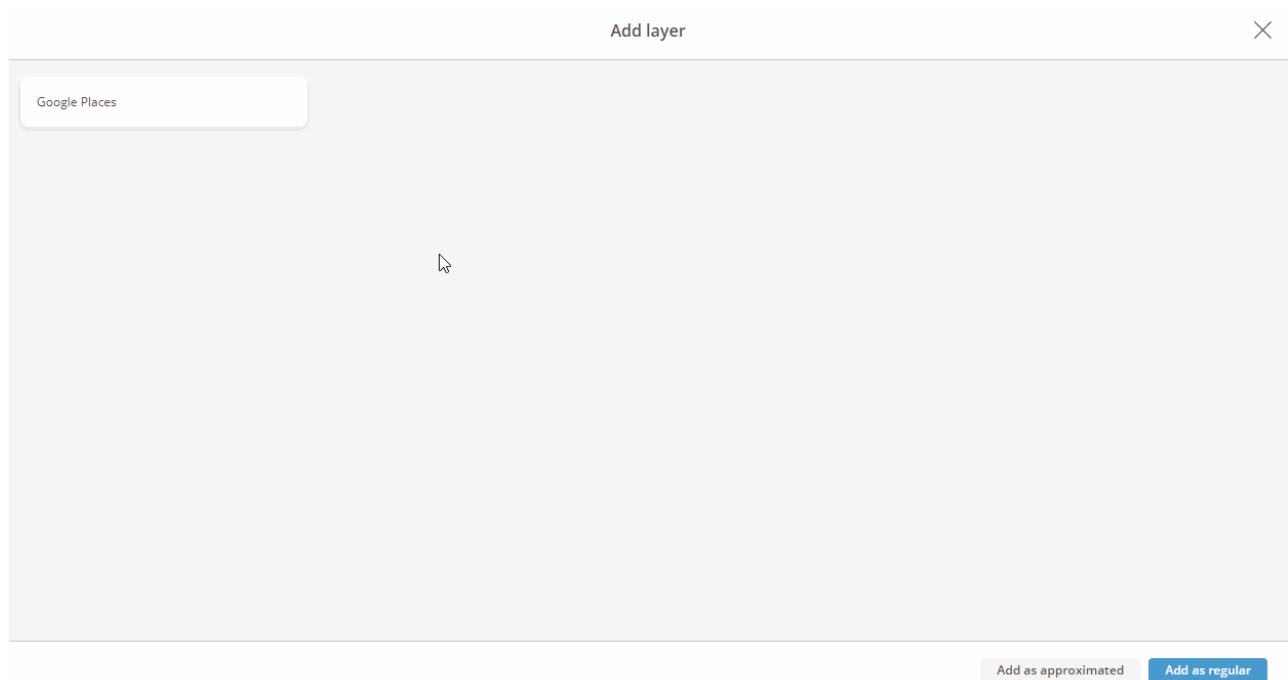
You can approximate regular Metrics while adding them to the regular project. Such Metrics can easily coexist with regular ones.

To approximate a regular Metric, select it in Metric explorer and apply *With approximation* checkbox before adding it to the project.

The calendar will appear in the approximated project as well. Here you need to set the time interval which will be approximated into the project one. For Metrics with slice duration one day or more, it's possible to select approximation type and aggregation function. For Metrics with slice duration less than one day, an additional parameter will be available — slice type.