THOMAS EAPEN · SELECTED WORK

From absence intervals to a clear report

A worked example that clips records to the reporting window, removes overlap within each person and allocates their absence to time periods.

Original report: **Excel** · Example calculations: **Python**

Synthetic example · independently invented data · One-page A3 landscape

570	20	30
minutes in the five raw records	minutes outside the reporting window	overlapping minutes counted once

INVENTED INPUTS

Five records, four people

Person	Start	End
A	08:20	10:20
A	09:50	10:50
B	09:30	12:10
C	11:15	13:45
D	13:00	14:20

Synthetic intervals; analysis window 08:00–14:00

Person A's two records overlap by 30 minutes. Person D's record extends 20 minutes beyond 14:00. Convert times to minute offsets before calculating.

Reporting periods are 08:00–10:00, 10:00–12:00 and 12:00–14:00.

SELECTED PYTHON

The calculation

records contains the input rows in minutes after 08:00. periods contains the three boundary pairs. merged_intervals merges overlapping records within one person. defaultdict is imported from collections.

```
def allocate_absence(records, periods):
    grouped = defaultdict(list)
    for record in records:
        grouped[record['person']].append(
            (record['start'], record['end'])
        )
    result = {}
    for person, intervals in sorted(grouped.items()):
        spans = merged_intervals(intervals)
        result[person] = [
            sum(max(0, min(end, right) - max(start,
left))
                for start, end in spans)
            for left, right in periods
        ]
    return result
```

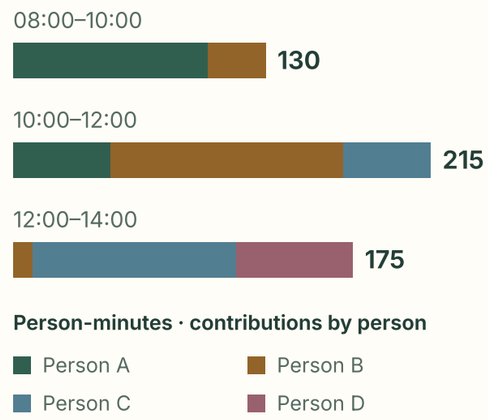
Extracted from the new helper that computes this example.

COMPUTED RESULT

Keep each person's contribution

520

person-minutes of absence



570 − 20 − 30 = 520. The three reporting periods sum to the same total.

Clip, deduplicate, then allocate

The interval calculation is max(0, min(end, period end) − max(start, period start)). Boundaries are half-open, so adjacent periods do not count the same minute twice.

Measure person-time

Overlapping records for one person count once. Absences of different people are summed separately, even when their clock times overlap. This is not the union of the whole team's clock time.

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New illustrative material explaining the approach. Values, configurations and results shown here are not historical workplace records.