# Tip Calculation Saas Application

## 1. Purpose

The purpose of this application is to calculate and record the amount of tips distributed to each restaurant employee based on their **work schedules**, **roles**, and **tip payment records**.

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## 2. Input

### Working Hours CSV File from Homebase

- **Contents:**
    - Location
    - Payroll Period
    - Name
    - Clock in date / Clock in time
    - Clock out date / Clock out time
    - Break start / Break end

### Tip Information CSV File from Toast / Crover

#### Toast

- **Contents:**
    - Opened (date and time)
    - Tip (amount received from customers)

#### Clover

- **Contents:**
    - Order Date (date and time)

    - Tip (amount received from customers)

## Cash Tip Information

- Additional manually entered data for cash-based tips not included in the CSV files.

## Role Mapping

The role mapping defines how each employee role from the imported working hours data is recognized and categorized for tip calculation.

This mapping allows the system to correctly identify which group — **FRONT**, **BACK**, or **FLOATERr** — each employee belongs to when calculating tip distribution.

If a role name contains certain keywords, it is assigned to the corresponding group:

- Roles containing **“FOH”** are recognized as **FRONT**.
- Roles containing **“BOH”** are recognized as **BACK**.
- Roles containing **“FLOATER”** are recognized as **FLOATER**.

For example:

- “FOH STAFF” → FRONT
- “FOH ASST MGR” → FRONT
- “BOH STAFF” → BACK

## Tip Mode Percentage

- Defines the distribution ratio of tips among different roles.
- Each Tip Mode simultaneously represents:
    1. **Work pattern** — which roles were on duty that day (0% = absent).
    2. **Distribution rule** — how the total tip amount is divided among the active roles.

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# 3. Output

- **Location**
- **Name**
- **Total Tip Amount**
- **Total Cash Tip Amount**

The output represents, for each employee, the total tip amount and total cash tip amount calculated for the given payroll period.

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# 4. Processing Logic

## 1 Convert Working Hours CSV and Tip CSV into a unified format suitable for calculation.

### 1-1. Processing Working Hours CSV

Extract Location and Payroll Period from the top section of the CSV file.
These values are used later to associate with the calculation and output results.

Each employee's working record is transformed into a simplified structure.
The transformation method differs depending on whether the record contains break information.

**1. When both Break start and Break end contain data**

One record is divided into two separate records.

The two new records are created according to the following rules:

- Name, Role, and Clock in date remain the same in both records.
- The column name Clock in date is renamed to Date.

**First record:**

- Start → Clock in time
- End → Break start

**Second record:**

- Start → Break end
- End → Clock out time

Other information (such as Wage, Break type, etc.) is not included in the new records.

**2. When Break start and Break end are empty**

The record is kept as a single record (no division).

It is converted using the following rules:

- Keep Name, Role, and Clock in date as they are.
- Rename Clock in date to Date.
- Start → Clock in time
- End → Clock out time

Other data columns are excluded.

After this transformation, the Working Hours CSV is standardized into a simple and consistent format containing only the following columns: **Name, Role, Date, Start, End.**

## 1-2 Processing the Tip CSV

There are two types of Tip CSV files — one exported from Toast and the other from Clover. Since their data formats differ, both are converted into a unified structure before calculation.

**For Toast**

Split the Opened column (e.g., 10/19/25 16:21) into two separate fields:

- Order Date → 10/19/25
- Payment Time → 16:21

Keep the Tip value as it is in the record.

The final format for each record becomes:
**Order Date, Payment Time, and Tip.**

**For Clover**

Split the Order Date column (e.g., 02-Nov-2025 08:09 PM PST) into two separate fields:

- Order Date → 11/02/25
- Payment Time → 20:09

Keep the Tip value as it is in the record.

After this process, both Toast and Clover tip files share the same standardized structure:
**Order Date, Payment Time, Tip.**

# 2. Calculate Tips

## 2-1. Data Sources

Two formatted tables generated from the previous data conversion process are used in the calculation:

- **A: Exported_TimeSheets_Table** – contains the formatted employee working records converted from the Working Hours CSV.
- **B: Exported_Tips_Table** – contains the formatted customer tip payment records converted from the Tip CSV.

## 2-2. Matching Working Records

For each record in Table B, the system uses the Order Date and Payment Time to find the matching working records from Table A.

Specifically, it searches for records in A where:

- The Date matches the Order Date, and

- The Payment Time falls between the employee's Start and End times.

This identifies all employees who were on duty at that exact time.

## 2-3. Counting Roles

Once the matching records are found, their Role values are analyzed.
Employees are grouped and counted based on their roles:

- FRONT: includes both FOH and F_TRAINEE
- BACK: includes both BOH and B_TRAINEE
- Floater: single category, no trainee

This determines, for that tip record, how many employees from each group were working.

## 2-4. Determining Tip Mode

Based on which groups were present, the system determines the Tip Mode (the distribution rule for that situation).

**Examples:**

- Only BACK working → Mode 1
- Only FRONT working → Mode 2
- FRONT and BACK working → Mode 3
- Only Floater working → Mode 4

Each Tip Mode defines how the total tip is divided among the three groups —
for example: FRONT 75%, BACK 25%, Floater 0%.

## 2-5. Distributing Tips by Group

Once the Tip Mode is identified, the total tip amount from that record is divided according to the percentage rule.

**For example:**
If the tip is $100 and Mode 3 applies:

- FRONT receives $75
- BACK receives $25
- Floater receives $0

## 2-6. Role-Based Distribution with Trainee Adjustment

Each group's portion (FRONT, BACK, Floater) is then distributed among the individuals within that group.
For FRONT and BACK, trainees are handled with special logic.

**Example: FRONT group**
Suppose:

- Total FRONT tip amount = $500
- 2 FOH (main staff) and 3 F_TRAINEE
- Total 5 people

**Steps:**

1. Divide $500 equally among all 5 people → $100 each.
2. Each trainee receives half of that → $50 each.
3. The remaining amount (the unpaid half: $150 total) is redistributed equally among the FOH staff.
4. Each FOH receives $100 + $75 = $175.

**Result:**

- FOH: $175 × 2 = $350
- F_TRAINEE: $50 × 3 = $150
- **Total = $500** ✅

The same rule applies to BACK (BOH and B_TRAINEE).
Floater has no trainee, so it's simply divided equally.

## 2-7. Accumulating Results

This process repeats for every record in the Tip table (B).
Each employee’s allocated tip amount is gradually accumulated.

At the end of the calculation, the system outputs the **total tip amount per employee** for the given working period (e.g., two weeks).