

mortgagemath at a glance



MortgageMath
Precise Loan Amortization in Python

mortgagemath 0.7.0 · rendered 2026-05-06

Produces fixed-rate and adjustable-rate mortgage amortization schedules that reproduce **published lender, regulator, and textbook examples to the cent**. Decimal end-to-end, stdlib-only.

Install and use

```
pip install mortgagemath
python -m mortgagemath          # post-install self-check

mortgagemath payment --principal 300000 --rate 6.5 --term-months 360
mortgagemath schedule --principal 300000 --rate 6.5 --term-months 360 \
  --format csv > schedule.csv
```

Worked example

```
from mortgagemath import us_30_year_fixed, periodic_payment, amortization_schedule

loan = us_30_year_fixed("300000", "6.5")
pmt = periodic_payment(loan)          # Decimal("1896.21")
sched = amortization_schedule(loan)   # closes at $0.00 on payment 360
```

#	Payment	Interest	Principal	Balance
1	\$ 1,896.21	\$ 1,625.00	\$ 271.21	\$ 299,728.79
240	\$ 1,896.21	\$ 909.89	\$ 986.32	\$ 166,992.91
360	\$ 1,889.51	\$ 10.18	\$ 1,879.33	\$ 0.00

Loan parameters

A wide variety of mortgage types can be represented by setting the parameters below. A robust test suite validates schedules from financial textbooks, regulatory documents, and other sources for US and Canadian mortgages, plus actuarial and finance-textbook examples, by choosing the right settings.

For common cases, start with a convenience constructor: `us_30_year_fixed`, `us_15_year_fixed`, `canada_fixed_j2`, `us_actual_360_commercial`, or `fixed_payment_mortgage`.

Required.

- **principal** — original loan amount (Decimal)
- **annual_rate** — annual interest rate as a percentage (Decimal)
- **term_months** — loan term in calendar months

Optional.

- **amortization_period_months** — set when \neq `term_months` for balloon loans (Fannie Mae §1103 SARM, Canadian fixed-term mortgages)
- **start_date** — issue date; required for `ACTUAL_360`
- **day_count** — `THIRTY_360` (US residential) · `ACTUAL_360` (US commercial / SARM)
- **balance_tracking** — `ROUND_EACH` (lender statements) · `CARRY_PRECISION` (Excel / CRE textbook)
- **payment_rounding / interest_rounding** — `ROUND_UP` (US lender default) · `ROUND_HALF_UP` · `ROUND_HALF_EVEN`
- **compounding** — `MONTHLY` (US) · `SEMI_ANNUAL` (Canadian j_2) · `ANNUAL`
- **payment_frequency** — `MONTHLY` · `SEMI_MONTHLY` · `BIWEEKLY` · `WEEKLY` · `QUARTERLY` · `ANNUAL`
- **rate_schedule** — list of `RateChange` (rate change at any payment, optional recast, optional payment cap with `neg-am`)

- **payment_override** — pin the periodic payment to a chosen value; the schedule's final row absorbs the residual (FHLBB 1935 “given-payment, find-term” convention)
- **fee_per_period** — flat amount added to each `Installment.payment` on top of the closed-form interest+principal value (modern French *assurance emprunteur*; 1852 Crédit Foncier *annuité* loading)