

FINCAD Python

Fixed Income, Derivative & Risk Analytics Framework

FINCAD Python empowers clients to solve complex derivative analytics challenges with unparalleled simplicity. Natively built in Python, our framework provides all the modelling capabilities of FINCAD's libraries while also encapsulating integration, configuration and more advanced use cases.

Who uses it and what for?

WHO IT'S FOR	BASE CALCULATIONS	USE CASES
Quants	Valuation	Backtesting
Strategists	Sensitivity (Greeks)	xVA
Risk Managers	Cash Flows	VAR
Traders	Scenario Analysis	P&L Attribution

Create value from day one with:

1) SIMPLICITY

- FINCAD Python allows for lightweight installation
- Instrument and market data integration is straightforward
- All modelling and valuation is pre-configured and validated
- Deployable on desktop, server, or cloud

2) CONTROL

- Users can fully configure modelling and valuation
- Users can extend FINCAD Python via the Python ecosystem
- Best-in-class derivative analytics allow you to understand all risk in your portfolio

3) SUPPORT

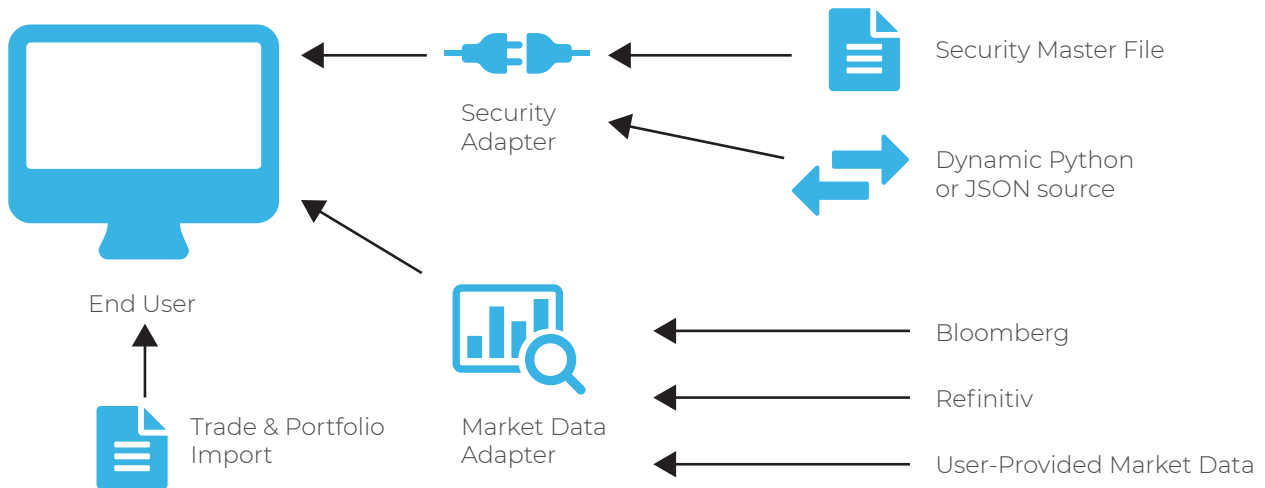
- Documentation allows for full self-sufficiency
- Expert team of quantitative developers and analysts to ensure success

Deployable on desktop, server, or cloud



Integrations & Connectivity

Connect market data & security detail through built-in adapters.



What does it look like?

Below are five samples of the application in-use.

1. Simple Example: Define Trades and submit for calculation, with a few lines of code.

Python Analytics - Swap Valuation

```
#Interest rate swap
swap_instrument = interest_rates.FixFloatSwap(
    notional="10mio",
    floating_rate_index=ref_ind.LiborUSD3m,
    maturity="2y",
    fixed_coupon=types.percent(1.5),
)
swap = swap_instrument.enter(direction=types.PayRec.pay)
result = swap.calculate()
result.value
```

-220,297.79 USD

2. Request other metrics of interest, such as the cash flows:

```
result.cashflows.to_dataframe()
```

	PaymentDate	PaymentCurrency	CashflowAmount	Notional	AccrualFraction	ImpliedAmount	IsFixedFlow	PayRecBuySell	DiscountFactor	DiscountedCashflow
0	2022-04-28	USD	75000.000000	10000000.0	0.500000	0.015000	True	rec	0.999063	74929.746696
1	2022-10-28	USD	75000.000000	10000000.0	0.500000	0.015000	True	rec	0.998616	74896.196611
2	2023-04-28	USD	75000.000000	10000000.0	0.500000	0.015000	True	rec	0.998628	74897.104381
3	2023-10-30	USD	75833.333333	10000000.0	0.505556	0.015000	True	rec	0.998654	75731.298411
4	2022-01-28	USD	-17379.180062	10000000.0	0.255556	0.006801	False	pay	0.999262	-17366.347780
5	2022-04-28	USD	-10413.896882	10000000.0	0.250000	0.004166	False	pay	0.999063	-10404.142073
6	2022-07-28	USD	-7704.073784	10000000.0	0.252778	0.003048	False	pay	0.998826	-7695.030432
7	2022-10-28	USD	-7763.141748	10000000.0	0.255556	0.003038	False	pay	0.998616	-7752.397209
8	2023-01-30	USD	-8424.333253	10000000.0	0.261111	0.003226	False	pay	0.998576	-8412.340740
9	2023-04-28	USD	-7288.006215	10000000.0	0.244444	0.002981	False	pay	0.998628	-7278.007496

3. Request sensitivities:

```
result.sensitivities.to_dataframe()
```

	Instrument	Currency	RawExposure	DV01	HedgeAmount
2	Futures LiborUSD3m MarchQuarterly4	USD	34980.113835	-349.801138	-13.992046
3	Futures LiborUSD3m MarchQuarterly5	USD	22448.086536	-224.480865	-8.979235
4	Futures LiborUSD3m MarchQuarterly6	USD	26574.128164	-265.741282	-10.629651
5	Futures LiborUSD3m MarchQuarterly7	USD	26666.953299	-266.669533	-10.666781

4. Request more advanced analytics, such as Scenario Analysis; Define a trade and scenario shifting market data, and see the effect on value.

```
basis_scenario = scenarios.InstrumentTypeMarketScenario(  
    instrument_type=ref_data.instrument_types.USD_BasisSwap_USFedFunds_Libor_3m, amount=0.0025  
)  
  
with basis_scenario:  
    basis_scenario_result = swap_trade.calculate(snapshot_selector=valuation_snapshot)  
  
basis_scenario_result.value  
  
228,537.36 USD  
  
basis_scenario_result.value - swap_trade.calculate(valuation_snapshot).value  
  
716.54 USD
```

5. Explore custom configuration, in this case by making adjustments to this notebook by adding meeting dates to the central bank index curve.

```
meeting_dates = [  
    datetime.date(2022, 6, 15),  
    datetime.date(2022, 7, 27),  
    datetime.date(2022, 9, 21),  
    datetime.date(2022, 11, 2),  
    datetime.date(2022, 12, 14),  
    datetime.date(2023, 2, 1),  
    datetime.date(2023, 3, 15),  
)  
ir_config.USD.meeting_dates = meeting_dates
```

Instrument Coverage

RATES

Futures (and options)

Deposits, FRA

Swaps (basis, Libor, CMS)

Caps / Floors

Swaptions (vanilla, bermudan)

Spread options (CMS, mid-curves)

Exotic IR

FX

Forward, futures, x-ccy swaps

American/European options (straddle, butterfly)

Basket

Variance, volatility swaps

Barrier (touch, single, dual, window)

PRDC

TARN, TARF

EQUITIES

Shares & TRS

European & American Options

Baskets

Digitals

Variance & Volatility Swaps

Range Accruals

Autocalls (single & multi)

Rates, FX, and Equity products are also provided as Quanto.

BONDS

Bonds (gvt, corporate)

Bond futures / options

Convertible Bonds

CREDIT

Asset swaps

CDS & CDS Index/Options

INFLATION

CPI/LPI, Year-on-year swaps

Year-on-year caps/floors

Zero-coupon, swaps/caps-floors

Inflation linked bonds

Exotic inflation

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