# Catala Syntax Cheat Sheet



## Literate programming

| Feature | English syntax | French syntax |
|---|---|---|
| Heading | `## Foo`<br>`### Bar` | `## Foo`<br>`### Bar` |
| Article | `## [Foo]`<br>`### [Bar]` | `## [Foo]`<br>`### [Bar]` |
| Code block | ```` ```catala ```` <br> ```` ``` ```` | ```` ```catala ```` <br> ```` ``` ```` |
| Metadata block | `> Begin metadata`<br>`> End metadata` | `> Début métadonnées`<br>`> Fin métadonnées` |
| File inclusion | `> Include: foo.catala_en` | `> Inclusion: foo.catala_fr` |
| Master file (only inclusions) | `> Master file` | `> Fichier maître` |

## Metadata declaration

| Feature | English syntax | French syntax |
|---|---|---|
| Structure declaration | `declaration structure Foo:`<br>`  data bar content integer`<br>`  data baz content boolean` | `déclaration structure Foo:`<br>`  donnée bar contenu entier`<br>`  donnée baz contenu booléen` |
| Enumeration declaration | `declaration enumeration Foo:`<br>`  -- Bar content integer`<br>`  -- Baz` | `déclaration énumeration Foo:`<br>`  -- Bar contenu entier`<br>`  -- Baz` |
| Scope declaration | `declaration scope Foo:`<br>`  context bar content integer`<br>`  context baz condition`<br>`  context fizz scope Buzz` | `déclaration champ d'application Foo:`<br>`  contexte bar contenu entier`<br>`  contexte baz condition`<br>`  contexte fizz champ d'application Buzz` |

## Types

| Feature | English syntax | French syntax |
|---|---|---|
| Natural integers | `integer` | `entier` |
| Rational numbers | `decimal` | `décimal` |
| Booleans | `boolean` | `booléen` |
| Money | `money` | `argent` |
| Date | `date` | `date` |
| Duration | `duration` | `durée` |
| Function | `Foo depends on Bar` | `Foo dépend de Bar` |
| Collection | `collection Foo` | `collection Foo` |

## Literals

| Feature | English syntax | French syntax |
|---|---|---|
| Integers | `65536` | `65536` |
| Decimals | `65536.262144` | `65536.262144` |
| Money | `$1,234,567.89` | `1 234 567,89 €` |
| Date | `\|01/01/2021\|` | `\|01/01/2021\|` |
| Durations | `254 day  4 month  1 year` | `254 jour  4 mois  1 an` |
| Boolean | `true  false` | `vrai  faux` |

## Scope use and related items

| Feature | English syntax | French syntax |
|---|---|---|
| Scope use | `scope Foo: ...` | `champ d'application Foo: ...` |
| Use-wide condition | `scope Foo`<br>`  under condition bar: ...` | `champ d'application Foo`<br>`  sous condition bar: ...` |
| Unconditional definition | `definition foo equals ...` | `définition foo égal à ...` |
| Conditional definition | `definition foo under condition`<br>`  bar consequence equals ...` | `définition foo sous condition`<br>`  bar conséquence égal à ...` |
| Rule (definition for conditions) | `rule foo under condition`<br>`  bar consequence fulfilled` | `règle foo sous condition`<br>`  bar conséquence rempli` |
| Negative rule | `rule foo under condition`<br>`  bar consequence not fulfilled` | `règle foo sous condition`<br>`  bar conséquence non rempli` |
| Function definition/rule | `definition foo of  bar ...` | `définition foo de bar ...` |
| Labeled definition or rule | `label foo definition bar ...` | `étiquette foo définition bar ...` |
| Exception to label | `exception foo definition bar ...` | `exception foo définition bar ...` |
| Exception to implicit | `exception definition bar ...` | `exception définition bar ...` |
| Assertion | `assertion...` | `assertion ...` |

## Expressions

| Feature | English syntax | French syntax |
|---|---|---|
| Pattern matching | `match ... with pattern`<br>`  -- Foo of foo: ...`<br>`  -- Bar : ...` | `selon ... sous forme`<br>`  -- Foo de foo: ...`<br>`  -- Bar: ...` |
| Pattern test and optional binding | `... with pattern Foo`<br>`... with pattern Bar of bar and ...` | `... sous forme Foo`<br>`... sous forme Bar de bar et` |
| Constructor injection | `Foo content ...  Bar` | `Foo contenu ...  Bar` |
| Structure literal | `Foo { -- bar: ... -- baz: ...}` | `Foo { -- bar: ... -- baz: ...}` |
| Structure field access | `(...).foo` | `(...).foo` |
| Function call | `... of ...` | `... de ...` |
| Subscope variable | `foo.bar` | `foo.bar` |
| Conditional | `if ... then ... else ...` | `si ... alors ... sinon` |

## Collections

| Feature | English syntax | French syntax |
|---|---|---|
| Collection literal | `[ ...; ...; ...]` | `[ ...; ...; ...]` |
| Presence test | `... in ...` | `... dans ...` |
| Cardinal | `number of ...` | `nombre de ...` |
| Existence test | `exists foo in ... such that ...` | `existe foo dans ... tel que ...` |
| For all test | `for all foo in ... we have ...` | `pour tout foo dans ... on a ...` |
| For all test | `for all foo in ... we have ...` | `pour tout foo dans ... on a ...` |
| Map/filter | `map for foo in ... of ...`<br>`filter for foo in ... of ...` | `application pour foo dans ... de ...`<br>`filtre pour foo dans ... de ...` |
| Aggregation | `sum money for foo in ... of ...` | `somme argent pour foo dans ... de ...` |
| Conditional count | `number for foo in ... of ...` | `nombre pour foo dans ... de ...` |
| Extremum | `maximum integer for ...` | `maximum entier pour ...` |
| Arg-extremum | `content minimum decimal for ...` | `contenu minimum décimal pour ...` |

## Operators

| Feature | English syntax | French syntax |
|---|---|---|
| Integer to decimal | `integer_to_decimal of ...` | `entier_vers_décimal de ...` |
| Date parts | `get_day of ...`<br>`get_month of ...`<br>`get_year of ...` | `accès_jour de ...`<br>`accès_mois de ...`<br>`accès_année de ...` |
| Logical inclusive or | `... or ...` | `... ou ...` |
| Logical exclusive or | `... xor ...` | `... ou bien ...` |
| Logical and | `... and ...` | `... et ...` |
| Polymorphic structural equality | `... = ...`<br>`... != ...` | `... = ...`<br>`... != ...` |
| Integer sum | `(integer) + (integer)` | `(entier) + (entier)` |
| Integer substraction | `(integer) - (integer)` | `(entier) - (entier)` |
| Integer multiplication | `(integer) * (integer)` | `(entier) * (entier)` |
| Integer division | `(integer) / (integer)` | `(entier) / (entier)` |
| Integer comparison | `< <= > >=` | `< <= > >=` |
| Decimal sum | `(decimal) +. (decimal)` | `(décimal) +. (décimal)` |
| Decimal substraction | `(decimal) -. (decimal)` | `(décimal) -. (décimal)` |
| Decimal multiplication | `(decimal) *. (decimal)` | `(décimal) *. (décimal)` |
| Decimal division | `(decimal) /. (decimal)` | `(décimal) /. (décimal)` |
| Decimal comparison | `<. <=. >. >=.` | `<. <=. >. >=.` |
| Money sum | `(money) +$ (money)` | `(argent) +€ (argent)` |
| Money substraction | `(money) -$ (money)` | `(argent) -€ (argent)` |
| Money multiplication | `(money) *$ (decimal)` | `(argent) *€ (décimal)` |
| Money division | `(money) /$ (money)` | `(argent) /€ (argent)` |
| Money comparison | `<$ <=$ >$ >=$` | `<€ <=€ >€ >=€` |
| Date sum | `(date) +@ (duration)` | `(date) +@ (durée)` |
| Date substraction | `(date) -@ (date)` | `(date) -@ (date)` |
| Date comparison | `<@ <=@ >@ >=@` | `<@ <=@ >@ >=@` |
| Duration sum | `(duration) +^ (duration)` | `(durée) +^ (durée)` |
| Duration substraction | `(duration) -^ (duration)` | `(durée) -^ (durée)` |
| Duration comparison | `<^ <=^ >^ >=^` | `<^ <=^ >^ >=^` |