

H

Syntax summary

H.1 Overview

This appendix repeats the syntax specifications of the preceding chapters, in the order in which they were introduced.

→ *Appendix I gives the same information in alphabetical construct order.*

For each construct, the number at right indicates the page on which the syntactical specification originally appears in the text.

H.2 Syntax

| | | | |
|-------------------|---|--|----|
| Class_declaration | ≡ | [Indexing] Class_header [Formal_generics] [Obsolete] [Inheritance] [Creators] [Features] [Invariant] end ["--" class Class_name] | 46 |
|-------------------|---|--|----|

| | | | |
|--------------|---|--------------------------------|----|
| Indexing | ≡ | indexing Index_list | 49 |
| Index_list | ≡ | {Index_clause ";" ...} | |
| Index_clause | ≡ | [Index] Index_terms | |
| Index | ≡ | Identifier ":" | |
| Index_terms | ≡ | {Index_value "," ...}* | |
| Index_value | ≡ | Identifier Manifest_constant | |

| | | | |
|--------------------------|---|--|----|
| Class_header | ≙ | [Header_mark] class Class_name | 50 |
| Header_mark | ≙ | deferred expanded | |
| Class_name | ≙ | Identifier | |
| Obsolete | ≙ | obsolete Message | 52 |
| Message | ≙ | Manifest_string | |
| Features | ≙ | feature {Feature_clause feature ...}+ | 60 |
| Feature_clause | ≙ | [Clients] [Header_comment] Feature_declaration_list | |
| Feature_declaration_list | ≙ | {Feature_declaration ";" ...} | |
| Header_comment | ≙ | Comment | |
| Feature_declaration | ≙ | New_feature_list Declaration_body | 63 |
| Declaration_body | ≙ | [Formal_arguments] [Type_mark] [Constant_or_routine] | |
| Constant_or_routine | ≙ | is Feature_value | |
| Feature_value | ≙ | Manifest_constant Unique Routine | |
| New_feature_list | ≙ | {New_feature "," ...}+ | 63 |
| New_feature | ≙ | [frozen] Feature_name | |
| Feature_name | ≙ | Identifier Prefix Infix | 68 |
| Prefix | ≙ | prefix "" Prefix_operator "" | |
| Infix | ≙ | infix "" Infix_operator "" | |
| Prefix_operator | ≙ | Unary Free_operator | |
| Infix_operator | ≙ | Binary Free_operator | |
| Unary | ≙ | not "+" "-" | 68 |
| Binary | ≙ | "+" "-" "*" "/" "<" ">" "<=" ">=" "//" "\" "^" and or xor and then or else implies | |

| | | | |
|--------------------------|---|--|-----|
| Inheritance | ≙ | inherit Parent_list | 77 |
| Parent_list | ≙ | {Parent ";" ...} | |
| Parent | ≙ | Class_type [Feature_adaptation] | |
| Feature_adaptation | ≙ | [Rename] [New_exports] [Undefine] [Redefine] [Select] end | |
| Rename | ≙ | rename Rename_list | 81 |
| Rename_list | ≙ | {Rename_pair ";" ...} | |
| Rename_pair | ≙ | Feature_name as Feature_name | |
| Clients | ≙ | "(" Class_list ")" | 101 |
| Class_list | ≙ | {Class_name ";" ...} | |
| New_exports | ≙ | export New_export_list | 101 |
| New_export_list | ≙ | {New_export_item ";" ...} | |
| New_export_item | ≙ | Clients Feature_set | |
| Feature_set | ≙ | Feature_list all | |
| Feature_list | ≙ | {Feature_name ";" ...} | |
| Formal_arguments | ≙ | "(" Entity_declaration_list ")" | 109 |
| Entity_declaration_list | ≙ | {Entity_declaration_group ";" ...} | |
| Entity_declaration_group | ≙ | Identifier_list Type_mark | |
| Identifier_list | ≙ | {Identifier ";" ...} ⁺ | |
| Type_mark | ≙ | ":" Type | |
| Routine | ≙ | [Obsolete] [Header_comment] [Precondition] [Local_declarations] Routine_body [Postcondition] [Rescue] end {"--" Feature_name} | 112 |

| | | | |
|----------------------------|---|--|-----|
| Routine_body | ≙ | Effective Deferred | 113 |
| Effective | ≙ | Internal External | |
| Internal | ≙ | Routine_mark Compound | |
| Routine_mark | ≙ | do once | |
| Deferred | ≙ | deferred | |
| Local_declarations | ≙ | local Entity_declaration_list | 114 |
| Instruction | ≙ | Creation Call Assignment Reverse_assignment_attempt Conditional Multi_branch Loop Debug Check Retry | 116 |
| Precondition | ≙ | require [else] Assertion | 120 |
| Postcondition | ≙ | ensure [then] Assertion | |
| Invariant | ≙ | invariant Assertion | |
| Assertion | ≙ | { Assertion_clause ";" ... } | |
| Assertion_clause | ≙ | [Tag_mark] Unlabeled_assertion_clause | |
| Unlabeled_assertion_clause | ≙ | Boolean_expression Comment | |
| Tag_mark | ≙ | Tag ":" | |
| Tag | ≙ | Identifier | |
| Old | ≙ | old Expression | 124 |
| Check | ≙ | check Assertion end | 129 |
| Variant | ≙ | variant [Tag_mark] Integer_expression | 130 |
| Redefine | ≙ | redefine Feature_list | 159 |
| Undefine | ≙ | undefine Feature_list | 160 |
| Select | ≙ | select Feature_list | 191 |

| | | | |
|---------------------|---|--|-----|
| Type | ≙ | Class_type Class_type_expanded Formal_generic_name Anchored Bit_type | 197 |
| Class_type | ≙ | Class_name [Actual_generics] | |
| Actual_generics | ≙ | "[" Type_list "]" | |
| Type_list | ≙ | {Type "," ...} | |
| Class_type_expanded | ≙ | expanded Class_type | |
| Bit_type | ≙ | <i>BIT</i> Constant | |
| Anchored | ≙ | like Anchor | |
| Anchor | ≙ | Identifier <i>Current</i> | |
| Formal_generics | ≙ | "{" Formal_generic_list "]" | 52 |
| Formal_generic_list | ≙ | {Formal_generic "," ...} | |
| Formal_generic | ≙ | Formal_generic_name [Constraint] | |
| Formal_generic_name | ≙ | Identifier | |
| Constraint | ≙ | "->" Class_type | |
| Compound | ≙ | {Instruction ";" ...} | 234 |
| Conditional | ≙ | if Then_part_list [Else_part] end | 235 |
| Then_part_list | ≙ | {Then_part elseif ...} ⁺ | |
| Then_part | ≙ | Boolean_expression then Compound | |
| Else_part | ≙ | else Compound | |
| Multi_branch | ≙ | inspect Expression [When_part_list] [Else_part] end | 239 |
| When_part_list | ≙ | when {When_part when ...} ⁺ | |
| When_part | ≙ | Choices then Compound | |
| Choices | ≙ | {Choice "," ...} | |
| Choice | ≙ | Constant Interval | |
| Interval | ≙ | Integer_interval Character_interval | |
| Integer_interval | ≙ | Integer_constant ".." Integer_constant | |
| Character_interval | ≙ | Character_constant ".." Character_constant | |
| Loop | ≙ | Initialization [Invariant] [Variant] Loop_body end | 243 |

| | | | |
|----------------------------|---|--|-----|
| Initialization | ≙ | from Compound | 243 |
| Loop_body | ≙ | Exit loop Compound | |
| Exit | ≙ | until Boolean_expression | |
| Debug | ≙ | debug [Debug_keys] Compound end | 245 |
| Debug_keys | ≙ | "(" Debug_key_list ")" | |
| Debug_key_list | ≙ | {Debug_key "," ...} | |
| Debug_key | ≙ | Manifest_string | |
| Rescue | ≙ | rescue Compound | 256 |
| Retry | ≙ | retry | |
| Unique | ≙ | unique | 265 |
| Entity | ≙ | Writable Read_only | 276 |
| Writable | ≙ | Attribute Local | |
| Attribute | ≙ | Identifier | |
| Local | ≙ | Identifier <i>Result</i> | |
| Read_only | ≙ | Formal <i>Current</i> | |
| Formal | ≙ | Identifier | |
| Creators | ≙ | creation | 285 |
| Creation_clause | ≙ | {Creation_clause creation ...} ⁺ [Clients] [Header_comment] Feature_list | |
| Creation | ≙ | "!" [Type] "!" Writable [Creation_call] | 285 |
| Creation_call | ≙ | ". " Unqualified_call | |
| Assignment | ≙ | Writable "!=" Expression | 311 |
| Reverse_assignment_attempt | ≙ | Writable "?=" Expression | 332 |
| Call | ≙ | [Parenthesized_qualifier] Call_chain | 342 |
| Parenthesized_qualifier | ≙ | Parenthesized "." | |
| Call_chain | ≙ | {Unqualified_call "." ...} ⁺ | |
| Unqualified_call | ≙ | Identifier [Actuals] | |

| | | | |
|---------------------|---|---|-----|
| Actuals | ≙ | "(" Actual_list ")" | 342 |
| Actual_list | ≙ | {Actual "," ...} | |
| Actual | ≙ | Expression Address | |
| Address | ≙ | "\$" Identifier | |
| Expression | ≙ | Call Operator_expression Equality Constant Local Read_only Manifest_array Old Strip | 373 |
| Boolean_expression | ≙ | Expression | |
| Equality | ≙ | Expression Comparison Expression | 374 |
| Comparison | ≙ | "=" "/=" | |
| Operator_expression | ≙ | Parenthesized { Unary_expression Binary_expression | 376 |
| Parenthesized | ≙ | "(" Expression ")" | |
| Unary_expression | ≙ | Unary Expression | |
| Binary_expression | ≙ | Expression Binary Expression | |
| Constant | = | Manifest_constant Constant_attribute | 387 |
| Constant_attribute | = | Identifier | |
| Manifest_constant | ≙ | Boolean_constant Character_constant Integer_constant Real_constant Manifest_string Bit_constant | 387 |
| Sign | ≙ | "+" "-" | |
| Integer_constant | ≙ | [Sign] Integer | |
| Character_constant | ≙ | "" Character "" | |
| Boolean_constant | ≙ | true false | |
| Real_constant | ≙ | [Sign] Real | |
| Manifest_string | ≙ | "" Simple_string "" | |
| Bit_constant | ≙ | Bit_sequence | |

| | | | |
|-----------------|---|---------------------------------------|-----|
| Manifest_array | ≙ | "<<" Expression_list ">>" | 393 |
| Expression_list | ≙ | {Expression "," ...} | |
| Strip | ≙ | strip "(" Attribute_list ")" | 397 |
| Attribute_list | ≙ | {Identifier "," ...} | |
| External | ≙ | external Language_name | 402 |
| Language_name | ≙ | [External_name] | |
| External_name | ≙ | alias Manifest_string | |
| Comment | ≙ | "-" {Simple_string Comment_break ...} | 413 |
| Comment_break | ≙ | New_line [Blanks_or_tabs] "-" | |

I

Syntax in alphabetical order

I.1 Overview

This appendix gives the full syntax of Eiffel. For ease of reference, the constructs are given in alphabetical order.

For each construct, the number at right indicates the page on which the syntactical specification appears in the text.

← *Appendix H gives the same information in the order in which the constructs were introduced in this book.*

I.2 Syntax

| | | | |
|------------------|---|--|-----|
| Actual | ≙ | Expression Address | 342 |
| Actual_generics | ≙ | "[" Type_list "]" | 197 |
| Actual_list | ≙ | {Actual "," ...} | 342 |
| Actuals | ≙ | "(" Actual_list ")" | 342 |
| Address | ≙ | "\$" Identifier | 342 |
| Anchor | ≙ | Identifier <i>Current</i> | 197 |
| Anchored | ≙ | like Anchor | 197 |
| Assertion | ≙ | {Assertion_clause ";" ...} | 120 |
| Assertion_clause | ≙ | [Tag_mark] Unlabeled_assertion_clause | 120 |
| Assignment | ≙ | Writable "!=" Expression | 311 |
| Attribute | ≙ | Identifier | 276 |
| Attribute_list | ≙ | {Identifier "," ...} | 397 |
| Binary | ≙ | "+" "-" "*" "/" "<" ">" "<=" ">=" "//" "\" "^" and or xor and then or else implies | 68 |

| | | | |
|---------------------|---|--|-----|
| Binary_expression | △ | Expression Binary Expression | 376 |
| Bit_constant | △ | Bit_sequence | 387 |
| Bit_type | △ | <i>BIT</i> Constant | 197 |
| Boolean_constant | △ | true false | 387 |
| Boolean_expression | △ | Expression | 373 |
| Call | △ | [Parenthesized_qualifier] Call_chain | 342 |
| Call_chain | △ | {Unqualified_call "." ...}* | 342 |
| Character_constant | △ | "" Character "" | 387 |
| Character_interval | △ | Character_constant | 239 |
| | | .." Character_constant | |
| Check | △ | check Assertion end | 129 |
| Choice | △ | Constant Interval | 239 |
| Choices | △ | {Choice "," ...} | 239 |
| Class_declaration | △ | [Indexing] | 46 |
| | | Class_header | |
| | | [Formal_generics] | |
| | | [Obsolete] | |
| | | [Inheritance] | |
| | | [Creators] | |
| | | [Features] | |
| | | [Invariant] | |
| | | end ["-" class Class_name] | |
| Class_header | △ | [Header_mark] class Class_name | 50 |
| Class_list | △ | {Class_name "," ...} | 101 |
| Class_name | △ | Identifier | 50 |
| Class_type | △ | Class_name [Actual_generics] | 197 |
| Class_type_expanded | △ | expanded Class_type | 197 |
| Clients | △ | "(" Class_list ")" | 101 |
| Comment | △ | "-" (Simple_string Comment_break ...) | 413 |
| Comment_break | △ | New_line [Blanks_or_tabs] "-" | 413 |
| Comparison | △ | "=" "/=" | 374 |
| Compound | △ | {Instruction ";" ...} | 234 |
| Conditional | △ | if Then_part_list [Else_part] end | 235 |
| Constant | = | Manifest_constant Constant_attribute | 387 |
| Constant_attribute | = | Identifier | 387 |
| Constant_or_routine | △ | is Feature_value | 63 |
| Constraint | △ | "->" Class_type | 52 |
| Creation | △ | !" [Type] !" Writable [Creation_call] | 285 |
| Creation_call | △ | ." Unqualified_call | 285 |
| Creation_clause | △ | [Clients] [Header_comment] | 285 |
| | | Feature_list | |
| Creators | △ | creation | 285 |
| | | {Creation_clause creation ...}* | |
| Debug | △ | debug [Debug_keys] Compound end | 245 |
| Debug_key | △ | Manifest_string | 245 |
| Debug_key_list | △ | {Debug_key "," ...} | 245 |
| Debug_keys | △ | "(" Debug_key_list ")" | 245 |

| | | | |
|--------------------------|---|---|-----|
| Declaration_body | ≙ | [Formal_arguments] [Type_mark] [Constant_or_routine] | 63 |
| Deferred | ≙ | deferred | 113 |
| Effective | ≙ | Internal External | 113 |
| Else_part | ≙ | else Compound | 235 |
| Entity | ≙ | Writable Read_only | 276 |
| Entity_declaration_group | ≙ | Identifier_list Type_mark | 109 |
| Entity_declaration_list | ≙ | {Entity_declaration_group ";" ...} | 109 |
| Equality | ≙ | Expression Comparison Expression | 374 |
| Exit | ≙ | until Boolean_expression | 243 |
| Expression | ≙ | Call Operator_expression Equality Constant Local Read_only Manifest_array Old Strip | 373 |
| Expression_list | ≙ | {Expression "," ...} | 393 |
| External | ≙ | external Language_name [External_name] | 402 |
| External_name | ≙ | alias Manifest_string | 402 |
| Feature_adaptation | ≙ | [Rename] [New_exports] [Undefine] [Redefine] [Select] end | 77 |
| Feature_clause | ≙ | [Clients] [Header_comment] Feature_declaration_list | 60 |
| Feature_declaration | ≙ | New_feature_list Declaration_body | 63 |
| Feature_declaration_list | ≙ | {Feature_declaration ";" ...} | 60 |
| Feature_list | ≙ | {Feature_name "," ...} | 101 |
| Feature_name | ≙ | Identifier Prefix Infix | 68 |
| Feature_set | ≙ | Feature_list all | 101 |
| Feature_value | ≙ | Manifest_constant Unique Routine | 63 |
| Features | ≙ | feature {Feature_clause feature ...} ⁺ | 60 |
| Formal | ≙ | Identifier | 276 |
| Formal_arguments | ≙ | "(" Entity_declaration_list ")" | 109 |
| Formal_generic | ≙ | Formal_generic_name {Constraint} | 52 |
| Formal_generic_list | ≙ | {Formal_generic "," ...} | 52 |
| Formal_generic_name | ≙ | Identifier | 52 |
| Formal_generics | ≙ | "{" Formal_generic_list "]" | 52 |
| Header_comment | ≙ | Comment | 60 |
| Header_mark | ≙ | deferred expanded | 50 |
| Identifier_list | ≙ | {Identifier "," ...} ⁺ | 109 |
| Index | ≙ | Identifier ":" | 49 |
| Index_clause | ≙ | [Index] Index_terms | 49 |
| Index_list | ≙ | {Index_clause ";" ...} | 49 |
| Index_terms | ≙ | {Index_value "," ...} ⁺ | 49 |
| Index_value | ≙ | Identifier Manifest_constant | 49 |

| | | | |
|-------------------------|---|--|-----|
| Indexing | △ | indexing Index_list | 49 |
| Infix | △ | infix "" Infix_operator "" | 68 |
| Infix_operator | △ | Binary Free_operator | 68 |
| Inheritance | △ | inherit Parent_list | 77 |
| Initialization | △ | from Compound | 243 |
| Instruction | △ | Creation Call Assignment Reverse_assignment_attempt Conditional Multi_branch Loop Debug Check Retry | 116 |
| Integer_constant | △ | [Sign] Integer | 387 |
| Integer_interval | △ | Integer_constant ".." Integer_constant | 239 |
| Internal | △ | Routine_mark Compound | 113 |
| Interval | △ | Integer_interval Character_interval | 239 |
| Invariant | △ | invariant Assertion | 120 |
| Language_name | △ | Manifest_string | 402 |
| Local | △ | Identifier <i>Result</i> | 276 |
| Local_declarations | △ | local Entry_declaration_list | 114 |
| Loop | △ | Initialization [Invariant] [Variant] Loop_body end | 243 |
| Loop_body | △ | Exit loop Compound | 243 |
| Manifest_array | △ | "<<" Expression_list ">>" | 393 |
| Manifest_constant | △ | Boolean_constant Character_constant Integer_constant Real_constant Manifest_string Bit_constant | 387 |
| Manifest_string | △ | "" Simple_string "" | 387 |
| Message | △ | Manifest_string | 52 |
| Multi_branch | △ | inspect Expression [When_part_list] [Else_part] end | 239 |
| New_export_item | △ | Clients Feature_set | 101 |
| New_export_list | △ | {New_export_item ";" ...} | 101 |
| New_exports | △ | export New_export_list | 101 |
| New_feature | △ | [frozen] Feature_name | 63 |
| New_feature_list | △ | {New_feature "," ...}* | 63 |
| Obsolete | △ | obsolete Message | 52 |
| Old | △ | old Expression | 124 |
| Operator_expression | △ | Parenthesized Unary_expression Binary_expression | 376 |
| Parent | △ | Class_type [Feature_adaptation] | 77 |
| Parent_list | △ | {Parent ";" ...} | 77 |
| Parenthesized | △ | "(" Expression ")" | 376 |
| Parenthesized_qualifier | △ | Parenthesized "." | 342 |
| Postcondition | △ | ensure [then] Assertion | 120 |

| | | | |
|----------------------------|---|---|-----|
| Precondition | △ | require [else] Assertion | 120 |
| Prefix | △ | prefix "" Prefix_operator "" | 68 |
| Prefix_operator | △ | Unary Free_operator | 68 |
| Read_only | △ | Formal <i>Current</i> | 276 |
| Real_constant | △ | [Sign] Real | 387 |
| Redefine | △ | redefine Feature_list | 159 |
| Rename | △ | rename Rename_list | 81 |
| Rename_list | △ | {Rename_pair ", " ...} | 81 |
| Rename_pair | △ | Feature_name as Feature_name | 81 |
| Rescue | △ | rescue Compound | 256 |
| Retry | △ | retry | 256 |
| Reverse_assignment_attempt | △ | Writable "?=" Expression | 332 |
| Routine | △ | [Obsolete] [Header_comment] [Precondition] [Local_declarations] Routine_body [Postcondition] [Rescue] end ["--" Feature_name] | 112 |
| Routine_body | △ | Effective Deferred | 113 |
| Routine_mark | △ | do once | 113 |
| Select | △ | select Feature_list | 191 |
| Sign | △ | "+" "-" | 387 |
| Strip | △ | strip "(" Attribute_list ")" | 397 |
| Tag | △ | Identifier | 120 |
| Tag_mark | △ | Tag ":" | 120 |
| Then_part | △ | Boolean_expression then Compound | 235 |
| Then_part_list | △ | {Then_part elseif ...}* | 235 |
| Type | △ | Class_type Class_type_expanded Formal_generic_name Anchored Bit_type | 197 |
| Type_list | △ | {Type ", " ...} | 109 |
| Type_mark | △ | ":" Type | 68 |
| Unary | △ | not "+" "-" | 376 |
| Unary_expression | △ | Unary Expression | 160 |
| Undefine | △ | undefine Feature_list | 265 |
| Unique | △ | unique | 120 |
| Unlabeled_assertion_clause | △ | Boolean_expression Comment | 342 |
| Unqualified_call | △ | Identifier [Actuals] | 130 |
| Variant | △ | variant [Tag_mark] Integer_expression | 239 |
| When_part | △ | Choices then Compound | 239 |
| When_part_list | △ | when {When_part when ...}* | 276 |
| Writable | △ | Attribute Local | |