

レポート 6

EX1

```
PS C:\Users\rmjap\Downloads\cafeobj-1.6.2-sbcl-win64\dist\cafeobj-1.6-sbcl> ./CafeOBJ.exe

-- loading standard prelude

    -- CafeOBJ system Version 1.6.2(PigNose0.99) --
      built: 2024 Nov 16 Sat 8:40:04 GMT
      prelude file: std.bin
      ***
      2025 Jul 4 Fri 4:13:45 GMT
      Type ? for help
      ***
    -- Containing PigNose Extensions --
      ---
      built on SBCL
      2.4.8
CafeOBJ> in subject6/ex1.cafe

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/./subject6/ex1.cafe

-- defining module! NAT-TRIPLE-IMLM
-- reading in file : nat

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/nat.cafe

-- defining module! NAT
-- reading in file : nznat
```

```
-- defining module! NAT
-- reading in file : nznat

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/nznat.cafe

-- defining module! NZNAT
-- reading in file : bool

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/bool.cafe

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/base_bool.cafe

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/truth.cafe

-- defining module! TRUTH
-- reading in file : truth

-- done reading in file: truth

-- defining module* BASE-BOOL
-- reading in file : eql

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/eql.cafe

-- defining module! EQL
-- done reading in file: eql
```

```
-- defining module! EQL
-- done reading in file: eql

processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/lib/sys_bool.cafe

-- defining module! BOOL
-- done reading in file: bool

-- done reading in file: nznat

-- done reading in file: nat

-- defining module! NAT-TRIPLE-OMLM
-- defining module! NAT-IF
-- defining module! GLIST
-- defining module! INF-LIST
-- defining module! NAT-INF-LIST
-- defining module! ERATOSTHENES-SIEVE
-- defining module! HAMMING
-- defining module! LOC
-- defining module! STATE
-- defining module! TID
-- defining module! FMUTEX
-- defining module! COMP
-- defining module! SCHED
-- defining module! SIM
-- opening module NAT-TRIPLE-IMLM
```

```
-- opening module NAT-TRIPLE-IMLM
-- reduce in %NAT-TRIPLE-IMLM : (1st(((1 + (1 + 1)) , (2 + 1) , (3 + 1)))):Nat
(3):NzNat
(0.0000 sec for parse, 0.0000 sec for 5 rewrites + 5 matches)
-- opening module NAT-TRIPLE-OMLM
-- reduce in %NAT-TRIPLE-OMLM : (1st(((1 + (1 + 1)) , (2 + 1) , (3 + 1)))):Nat
(3):NzNat
(0.0000 sec for parse, 0.0000 sec for 3 rewrites + 3 matches)
-- opening module NAT-INF-LIST
-- reduce in %NAT-INF-LIST : (mkNILFrom(0)):Inflist
(0 | mkNILFrom(1)):Inflist
(0.0000 sec for parse, 0.0000 sec for 1 rewrites + 1 matches)
-- reduce in %NAT-INF-LIST : (take(mkNILFrom(0),10)):List
(0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 41 rewrites + 51 matches)
-- reduce in %NAT-INF-LIST : (drop(mkNILFrom(0),10)):Inflist
(10 | mkNILFrom((1 + 10))):Inflist
(0.0000 sec for parse, 0.0000 sec for 41 rewrites + 51 matches)
-- reduce in %NAT-INF-LIST : (take(drop(mkNILFrom(0),997),10)):List
(997 | 998 | 999 | 1000 | 1001 | 1002 | 1003 | 1004 | 1005 | 1006 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 4030 rewrites + 5037 matches)
-- reduce in %NAT-INF-LIST : (take((take(mkNILFrom(0),10) @ drop(mkNILFrom(0),10)),20)):List
(0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 154 rewrites + 204 matches)
-- reduce in %NAT-INF-LIST : (take(mkNILFrom(0),20)):List
(0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 81 rewrites + 101 matches)
```

```
-- reduce in %NAT-INF-LIST : (zip(mkNILFrom(0),mkNILFrom(0))):Inflist
(0 | 0 | zip(mkNILFrom(1),mkNILFrom(1))):Inflist
(0.0000 sec for parse, 0.0000 sec for 3 rewrites + 3 matches)
-- reduce in %NAT-INF-LIST : (take(drop(zip(mkNILFrom(0),mkNILFrom(0)),997),10)):List
(498 | 499 | 500 | 501 | 502 | 503 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 4532 rewrites + 5539 matches)
-- opening module ERATOSTHENES-SIEVE
-- reduce in %ERATOSTHENES-SIEVE : (primes):Inflist
(2 | sieve(check(2,mkNILFrom(1 + 2)))):Inflist
(0.0000 sec for parse, 0.0000 sec for 3 rewrites + 3 matches)
-- reduce in %ERATOSTHENES-SIEVE : (take(primes,10)):List
(2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 332 rewrites + 483 matches)
-- reduce in %ERATOSTHENES-SIEVE : (take(primes,20)):List
(2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 | 31 | 37 | 41 | 43 | 47 | 53 | 59 | 61 | 67 | 71 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 1055 rewrites + 1590 matches)
-- reduce in %ERATOSTHENES-SIEVE : (take(primes,50)):List
(2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 | 31 | 37 | 41 | 43 | 47 | 53 | 59 | 61 | 67 | 71 | 73 | 79 | 83 | 89 | 97 | 101 | 103 | 107 | 113 | 127 | 131 | 137 | 139 | 149 | 151 | 157 | 163 | 167 | 173 | 179 | 181 | 191 | 193 | 197 | 199 | 211 | 223 | 227 | 229 | nil))))))):List
(0.0000 sec for parse, 0.0469 sec for 5332 rewrites + 8345 matches)
-- reduce in %ERATOSTHENES-SIEVE : (take(primes,100)):List
(2 | 3 | 5 | 7 | 11 | 13 | 17 | 19 | 23 | 29 | 31 | 37 | 41 | 43 | 47 | 53 | 59 | 61 | 67 | 71 | 73 | 79 | 83 | 89 | 97 | 101 | 103 | 107 | 113 | 127 | 131 | 137 | 139 | 149 | 151 | 157 | 163 | 167 | 173 | 179 | 181 | 191 | 193 | 197 | 199 | 211 | 223 | 227 | 229 | 233 | 239 | 241 | 251 | 257 | 263 | 269 | 271 | 277 | 281 | 283 | 293 | 307 | 311 | 313 | 317 | 331 | 337 | 347 | 349 | 353 | 359 | 367 | 373 | 379 | 383 | 389 | 397 | 401 | 409 | 419 | 421 | 431 | 433 | 439 | 443 | 449 | 457 | 461 | 463 | 467 | 479 | 487 | 491 | 499 | 503 | 509 | 521 | 523 | 541 | nil))))))):List
(0.0000 sec for parse, 0.0469 sec for 5332 rewrites + 8345 matches)
```

```
(0.0000 sec for parse, 0.2813 sec for 18953 rewrites + 30314 matches)
-- opening module HAMMING
-- reduce in %HAMMING : (ham):Inflist
(1 | merge(merge(2*(ham),3*(ham)),5*(ham))):Inflist
(0.0000 sec for parse, 0.0000 sec for 1 rewrites + 1 matches)
-- reduce in %HAMMING : (take(ham,10)):List
(1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 12 | nil))))))):List
(0.0000 sec for parse, 0.0000 sec for 404 rewrites + 438 matches)
-- reduce in %HAMMING : (take(ham,20)):List
(1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 12 | 15 | 16 | 18 | 20 | 24 | 25 | 27 | 30 | 32 | 36 | nil))))))):List
(0.0000 sec for parse, 0.0156 sec for 1370 rewrites + 1484 matches)
-- reduce in %HAMMING : (take(ham,50)):List
(1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 12 | 15 | 16 | 18 | 20 | 24 | 25 | 27 | 30 | 32 | 36 | 40 | 45 | 48 | 50 | 54 | 60 | 64 | 72 | 75 | 80 | 81 | 90 | 96 | 100 | 108 | 120 | 125 | 128 | 135 | 144 | 150 | 160 | 162 | 180 | 192 | 200 | 216 | 225 | 240 | 243 | nil))))))):List
(0.0000 sec for parse, 0.3906 sec for 10026 rewrites + 11788 matches)
-- reduce in %HAMMING : (take(ham,100)):List
(1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 | 10 | 12 | 15 | 16 | 18 | 20 | 24 | 25 | 27 | 30 | 32 | 36 | 40 | 45 | 48 | 50 | 54 | 60 | 64 | 72 | 75 | 80 | 81 | 90 | 96 | 100 | 108 | 120 | 125 | 128 | 135 | 144 | 150 | 160 | 162 | 180 | 192 | 200 | 216 | 225 | 240 | 243 | 250 | 256 | 270 | 288 | 300 | 320 | 324 | 360 | 375 | 384 | 400 | 405 | 432 | 450 | 480 | 486 | 500 | 512 | 540 | 576 | 600 | 625 | 640 | 648 | 675 | 720 | 729 | 750 | 768 | 800 | 810 | 864 | 900 | 960 | 972 | 1000 | 1024 | 1080 | 1125 | 1152 | 1200 | 1215 | 1250 | 1280 | 1296 | 1350 | 1440 | 1458 | 1500 | 1536 | nil))))))):List
(0.0000 sec for parse, 11.3906 sec for 72940 rewrites + 79462 matches)
-- opening module SIM
-- reduce in %SIM : (sim-check((locked: false , pc1: rs , pc2: rs),123,10)):FComp
((locked: false , pc1: rs , pc2: rs) | ((locked: false , pc1: rs , pc2: ms) | ((locked: true , pc1: rs , pc2: cs) | ((locked: true , pc1: rs , pc2: cs) | ((locked: false
```

```
, pc1: rs , pc2: rs) | ((locked: false , pc1: rs , pc2: ms) | ((locked: true , pc1: rs , pc2: cs) | ((locked: false , pc1: rs , pc2: rs) | ((locked: false , pc1: ms , p
c2: rs) | ((locked: true , pc1: cs , pc2: rs) | ((locked: false , pc1: rs , pc2: rs) | nil))))))):FComp
(0.0000 sec for parse, 0.0000 sec for 145 rewrites + 223 matches)
-- reduce in %SIM : (sim-check((locked: false , pc1: rs , pc2: rs),1234,10)):FComp
((locked: false , pc1: rs , pc2: rs) | ((locked: false , pc1: ms , pc2: rs) | ((locked: false , pc1: ms , pc2: ms) | ((locked: true , pc1: cs , pc2: ms) | ((locked: fals
e , pc1: rs , pc2: ms) | ((locked: true , pc1: rs , pc2: cs) | ((locked: true , pc1: rs , pc2: cs) | ((locked: false , pc1: rs , pc2: rs) | ((locked: false , pc1: rs , p
c2: ms) | ((locked: false , pc1: ms , pc2: ms) | ((locked: true , pc1: cs , pc2: ms) | nil))))))):FComp
(0.0000 sec for parse, 0.0000 sec for 145 rewrites + 212 matches)
-- reduce in %SIM : (sim-check((locked: false , pc1: rs , pc2: rs),12345,10)):FComp
((locked: false , pc1: rs , pc2: rs) | ((locked: false , pc1: rs , pc2: ms) | ((locked: false , pc1: ms , pc2: ms) | ((locked: true , pc1: cs , pc2: ms) | ((locked: true
, pc1: cs , pc2: cs) | nil))))):FComp
(0.0000 sec for parse, 0.0000 sec for 68 rewrites + 101 matches)
-- opening module SCHED
-- reduce in %SCHED : (take(sched(123),10)):List
(t2 | (t2 | (t1 | (t2 | (t2 | (t2 | (t2 | (t1 | (t1 | (t1 | nil)))))))))List
(0.0000 sec for parse, 0.0000 sec for 64 rewrites + 80 matches)
-- reduce in %SCHED : (take(sched(1234),10)):List
(t1 | (t2 | (t1 | (t1 | (t2 | (t1 | (t2 | (t2 | (t1 | (t1 | nil)))))))))List
(0.0000 sec for parse, 0.0000 sec for 64 rewrites + 79 matches)
-- reduce in %SCHED : (take(sched(12345),10)):List
(t2 | (t1 | (t1 | (t2 | (t2 | (t2 | (t1 | (t1 | (t1 | (t1 | nil)))))))))List
(0.0000 sec for parse, 0.0000 sec for 64 rewrites + 78 matches)
CafeOBJ> █
```

Ex2

```
CafeOBJ> in subject6/ex2.cafe
```

```
processing input : C:/Users/rmjap/Downloads/cafeobj-1.6.2-sbcl-win64/dist/cafeobj-1.6-sbcl/./subject6/e
x2.cafe
```

```
-- defining module! NAT-TRIPLE-IMLM
[Warning]: Redefining module NAT-TRIPLE-IMLM
-- defining module! NAT-TRIPLE-OMLM
[Warning]: Redefining module NAT-TRIPLE-OMLM
-- defining module! NAT-IF
[Warning]: Redefining module NAT-IF
-- defining module! GLIST
[Warning]: Redefining module GLIST
-- defining module! INF-LIST
[Warning]: Redefining module INF-LIST
-- defining module! NAT-INF-LIST
[Warning]: Redefining module NAT-INF-LIST
-- defining module! ERATOSTHENES-SIEVE
[Warning]: Redefining module ERATOSTHENES-SIEVE
-- defining module! HAMMING
[Warning]: Redefining module HAMMING
-- defining module! LOC
[Warning]: Redefining module LOC
-- defining module! STATE
[Warning]: Redefining module STATE
-- defining module! TID
```

```
[Warning]: Redefining module TID
-- defining module! FMUTEX
[Warning]: Redefining module FMUTEX
-- defining module! COMP
[Warning]: Redefining module COMP
-- opening module NAT
-- reduce in %NAT : (4 rem 3):Nat
(1):NzNat
(0.0000 sec for parse, 0.0000 sec for 1 rewrites + 1 matches)
-- defining module! SCHED
[Warning]: Redefining module SCHED
-- defining module! SIM
[Warning]: Redefining module SIM
-- opening module SIM
```

