Lazy Racket

Version 5.1

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```
#lang lazy
```

Lazy Racket is available as both a language level and a module that can be used to write lazy code. To write lazy code, simply use lazy as your module's language:

```
#lang lazy
... lazy code here...
```

Function applications are delayed, and promises are automatically forced. The language provides bindings that are equivalent to most of the mzscheme and scheme/list libraries. Primitives are strict in the expected places; struct constructors are lazy; if, and, or etc. are plain (lazy) functions. Strict functionality is provided as-is: begin, I/O, mutation, parameterization, etc. To have your code make sense, you should chain side effects in begins, which will sequence things properly. (Note: This is similar to threading monads through your code—only use begin where order matters.)

Mixing lazy and strict code is simple: you just write the lazy code in the lazy language, and strict code as usual. The lazy language treats imported functions (those that were not defined in the lazy language) as strict, and on the strict side you only need to force (possibly recursively) through promises.

A few side-effect bindings are provided as-is. For example, read and printf do the obvious thing—but note that the language is a call-by-need, and you need to be aware when promises are forced. There are also bindings for begin (delays a computation that forces all sub-expressions), when, unless, etc. There are, however, less reliable and might change (or be dropped) in the future.

There are a few additional bindings, the important ones are special forms that force strict behaviour—there are several of these that are useful in forcing different parts of a value in different ways, as described in §2 "Forcing Values".

1 Lazy Forms and Functions

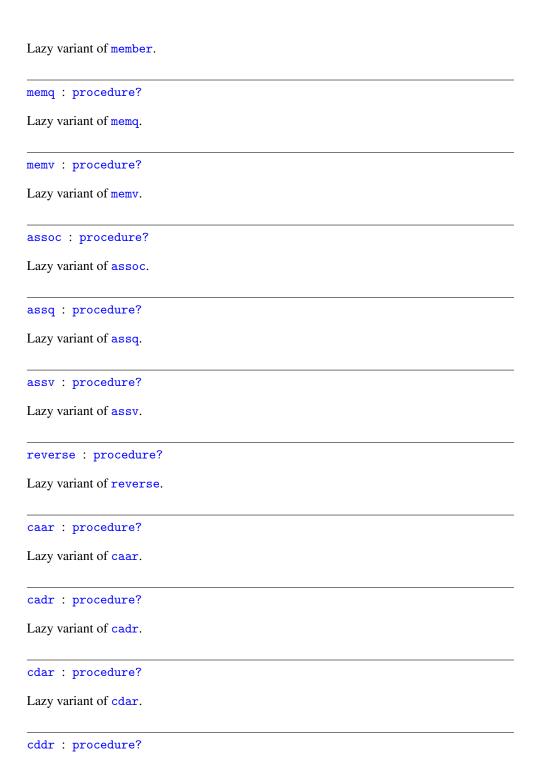
lambda
Lazy variant of lambda.
define
Lazy variant of define.
let
Lazy variant of let.
let*
Lazy variant of let*.
letrec
Lazy variant of letrec.
parameterize
Lazy variant of parameterize.
define-values
Lazy variant of define-values.
let-values
Lazy variant of let-values.
let*-values
Lazy variant of let*-values.
letrec-values

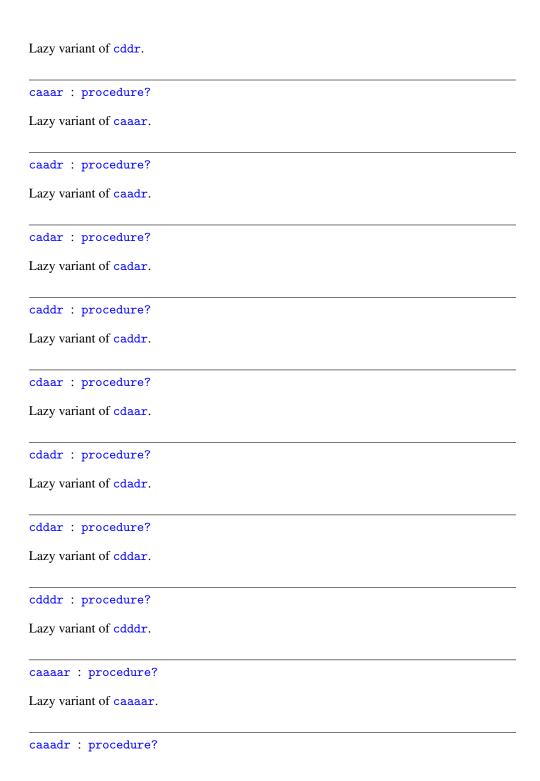
Lazy variant of letrec-values.		
if		
Lazy variant of if.		
set!		
Lazy variant of set!.		
begin		
Lazy variant of begin.		
begin0		
Lazy variant of begin0.		
when		
Lazy variant of when.		
unless		
Lazy variant of unless.		
cond		
Lazy variant of cond.		
case		
Lazy variant of case.		
values : procedure?		
Lazy variant of values.		
make-struct-type : procedure?		

```
Lazy variant of make-struct-type.
cons : procedure?
Lazy variant of cons.
list : procedure?
Lazy variant of list.
list* : procedure?
Lazy variant of list*.
vector : procedure?
Lazy variant of vector.
box : procedure?
Lazy variant of box.
and : procedure?
Lazy variant of and.
or : procedure?
Lazy variant of or.
set-mcar! : procedure?
Lazy variant of set-mcar!.
set-mcdr! : procedure?
Lazy variant of set-mcdr!.
vector-set! : procedure?
```

```
Lazy variant of vector-set!.
set-box! : procedure?
Lazy variant of set-box!.
error : procedure?
Lazy variant of error.
printf : procedure?
Lazy variant of printf.
fprintf : procedure?
Lazy variant of fprintf.
display : procedure?
Lazy variant of display.
write : procedure?
Lazy variant of write.
print : procedure?
Lazy variant of print.
eq? : procedure?
Lazy variant of eq?.
eqv? : procedure?
Lazy variant of eqv?.
equal? : procedure?
```

```
Lazy variant of equal?.
list? : procedure?
Lazy variant of list?.
length : procedure?
Lazy variant of length.
list-ref : procedure?
Lazy variant of list-ref.
list-tail : procedure?
Lazy variant of list-tail.
append : procedure?
Lazy variant of append.
map : procedure?
Lazy variant of map.
for-each : procedure?
Lazy variant of for-each.
andmap : procedure?
Lazy variant of andmap.
ormap : procedure?
Lazy variant of ormap.
member : procedure?
```





Lazy variant of caaadr.	
caadar : procedure?	
Lazy variant of caadar.	
caaddr : procedure?	
Lazy variant of caaddr.	
cadaar : procedure?	
Lazy variant of cadaar.	
cadadr : procedure?	
Lazy variant of cadadr.	
caddar : procedure?	
Lazy variant of caddar.	
cadddr : procedure?	
Lazy variant of cadddr.	
cdaaar : procedure?	
Lazy variant of cdaaar.	
cdaadr : procedure?	
Lazy variant of cdaadr.	
cdadar : procedure?	
Lazy variant of cdadar.	
cdaddr : procedure?	

```
Lazy variant of cdaddr.
cddaar : procedure?
Lazy variant of cddaar.
cddadr : procedure?
Lazy variant of cddadr.
cdddar : procedure?
Lazy variant of cdddar.
cddddr : procedure?
Lazy variant of cddddr.
first : procedure?
Lazy variant of first.
second : procedure?
Lazy variant of second.
third : procedure?
Lazy variant of third.
fourth : procedure?
Lazy variant of fourth.
fifth : procedure?
Lazy variant of fifth.
sixth : procedure?
```

```
Lazy variant of sixth.
seventh : procedure?
Lazy variant of seventh.
eighth : procedure?
Lazy variant of eighth.
rest : procedure?
Lazy variant of rest.
cons? : procedure?
Lazy variant of cons?.
empty : procedure?
Lazy variant of empty.
empty? : procedure?
Lazy variant of empty?.
fold1 : procedure?
Lazy variant of foldl.
foldr : procedure?
Lazy variant of foldr.
last-pair : procedure?
Lazy variant of last-pair.
remove : procedure?
```

```
Lazy variant of remove.
remq : procedure?
Lazy variant of remq.
remv : procedure?
Lazy variant of remv.
remove* : procedure?
Lazy variant of remove*.
remq* : procedure?
Lazy variant of remq*.
remv* : procedure?
Lazy variant of remv*.
memf : procedure?
Lazy variant of memf.
assf : procedure?
Lazy variant of assf.
filter : procedure?
Lazy variant of filter.
sort : procedure?
Lazy variant of sort.
true : procedure?
```

```
Lazy variant of true.
false : procedure?
Lazy variant of false.
boolean=? : procedure?
Lazy variant of boolean=?.
symbol=? : procedure?
Lazy variant of symbol=?.
compose : procedure?
Lazy variant of compose.
build-list : procedure?
Lazy variant of build-list.
take : procedure?
Lazy variant of take.
identity : procedure?
Lazy identity function.
cycle : procedure?
```

Creates a lazy infinite list given a list of elements to repeat in order.

2 Forcing Values

```
(require lazy/force)
```

The bindings of lazy/force are re-provided by lazy.

Evaluates *expr* strictly. The result is always forced, over and over until it gets a non-promise value

Similar to !, but recursively forces a structure (e.g. lists).

```
(!list expr) → list?
expr : (or/c promise? list?)
```

Forces the *expr* which is expected to be a list, and forces the *cdrs* recursively to expose a proper list structure.

```
(!!list expr) → list?
expr : (or/c promise? list?)
```

Similar to !list but also forces (using !) the elements of the list.