Emacs, eev, and Maxima – Now!

Eduardo Ochs

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http://anggtwu.net/emacsconf2024.html
https://emacsconf.org/2024/talks/maxima/

Links

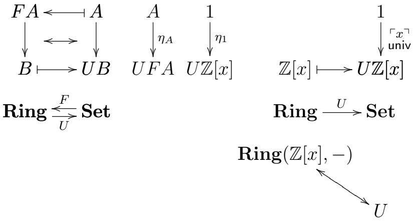
http://anggtwu.net/math-b.html#2022-md

http://www.math.jhu.edu/~eriehl/
http://www.math.jhu.edu/~eriehl/context.pdf

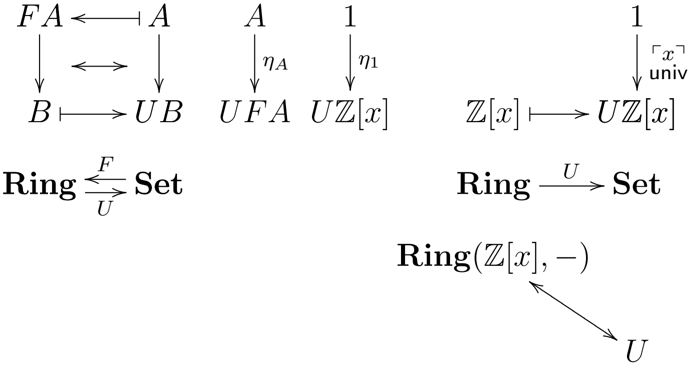
Yoneda on rings

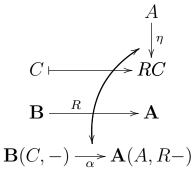
This is the example (iv) in p.52 of Emily Riehl's "*Category Theory in Context*":

The functor U : **Ring** → **Set** is represented by the unital ring $\mathbb{Z}[x]$, the polynomial ring in one variable with integer coefficients. A unital ring homomorphism $Z[x] \to R$ is uniquely determined by the image of x; put another way, $\mathbb{Z}[x]$ is the *free unital ring on a single generator*.



Yoneda on rings





$\mathbf{A}$ is a category,
$\mathbf{B}$ is a category,
$R : \mathbf{B} \to \mathbf{A}$,
$A \in \mathbf{A}$,
$C \in \mathbf{B}$,
$\eta : A \to RD$,

$\mathbf{B}(C, -) : \mathbf{B} \to \mathbf{Set}$,
$\mathbf{B}(C, -)_0 := \lambda D.\mathbf{B}(C, D)$,
$\mathbf{B}(C, -)_1 := \lambda g.\lambda f.\ g \circ f$,

$\mathbf{A}(A, R-) : \mathbf{A} \to \mathbf{Set}$,
$\mathbf{A}(A, R-)_0 := \lambda D.\mathbf{A}(A, RD)$,
$\mathbf{A}(A, R-)_1 := \lambda g.\lambda h.Rg \circ h$,

$\alpha : \mathbf{B}(C, -) \to \mathbf{A}(A, R-)$,

$(\eta \mapsto \alpha_0) := \lambda \eta.\lambda D.\lambda f.\ Rf \circ \eta$,
$(\alpha \mapsto \eta) := \lambda \alpha.\ \alpha C(\mathrm{id}_C)$,

or:
$\alpha_0 := \lambda D.\lambda f.Rf \circ \eta$,
$\eta := \alpha C(\mathrm{id}_C)$.