English Language & Usage Stack
Exchange is a question and answer site
for linguists, etymologists, and serious
English language enthusiasts. It's 100%
free, no registration required.

Here's how it works:

Q

Anybody can ask
a question

A
A A

Anybody can
answer

A
A A A

The best answers are voted
up and rise to the top

[Sign up]

Where does the term "Monad" come from?

I understand how monads work, and I use them on a routine basis. However, I've been wondering where the term actually comes from and
what does it mean?

Edit: To clarify, I'm specifically referring to the origin of the term.

etymology   terminology

edited Jun 21 '11 at 2:19

jozzas
295 ●1 ○4 ●11

asked Jun 20 '11 at 6:09

Kurios

---

migrated from programmers.stackexchange.com Jun 20 '11 at 20:05

This question came from our site for professional programmers interested in conceptual questions about software development.

This may help? en.wikipedia.org/wiki/Monad – Crazy Eddie Jun 20 '11 at 6:43

2   From your comments on the answers so far, it looks like the question could do with a bit more clarity. –
Paul Butcher Jun 20 '11 at 8:44

3   For the benefit of anyone seeing this question after the migration, the question is specifically about this
term, not other uses of the word. – camccann Jun 20 '11 at 20:20

Thanks to camccann for taking the time to give such en excellent answer. Sadly I wasn't logged in properly
at the time I posted it, so now I can't upvote it or mark it as correct. – user10131 Jun 21 '11 at 0:47

If you want ownership of the question back, you might be able to get a moderator to help--I gather that
merging unintentional duplicate accounts comes up fairly often. I'm not sure how to go about requesting it,
though. But don't worry on my account, knowing I helped is all I need. :] – camccann Jun 21 '11 at 1:08 ✎

6 Answers

You seem to be asking about the origin of the term as used in category theory. The history of
the term there is somewhat unclear, but it can at least be traced back a little ways:

- The term is sometimes attributed to Mac Lane, but this seems to be inaccurate; however,
  the widespread *use* of the term is probably due to his influential "Categories for the
  Working Mathematician", replacing the remarkably terrible term "triple".

  > The frequent but unfortunate use of the word "triple" in this sense has achieved a
  > maximum of needless confusion, what with the conflict with ordered triple, plus the use
  > of associated terms such as "triple derived functors" for functors which are not three
  > times derived from anything in the world. Hence the term monad.

- Mac Lane's use of the term was apparently prompted by J. P. May:

  > The name "operad" is a word that I coined myself, spending a week thinking about
  > nothing else. Besides having a nice ring to it, the name is meant to bring to mind both
  > operations and monads. Incidentally, I persuaded MacLane to discard the term "triple"
  > in favor of "monad" in his book "Categories for the working mathematician", which was
  > being written about the same time. I was convinced that the notion of an operad was
  > an important one, and I wanted the names to mesh.

- Elsewhere, Ross Street attributes the term to Jean Bénabou:

  > Meanwhile Jean Bénabou had invented weak 2-categories, calling them bicategories.
  > (...) He pointed out that a lax functor from the terminal category 1 to Cat was a
  > category A equipped with a "standard construction" or "triple" (that is, a monoid in the

monoidal category [A, A] of endofunctors of A where the tensor product is composition); he introduced the term monad for this concept.

The attribution to Bénabou is also mentioned here.

- The motivation for the term is to suggest a relationship with monoids, as can be deduced from the construction given in the quote above, and the Greek root "monos" comes second-hand. The connection to philosophy in general, or Leibniz in particular, is often asserted but never to my knowledge supported in any way. More likely if anything would be a connection to the term "monad" used in non-standard analysis, also related to Leibniz, but I'm not sure what the conceptual link there would be. An anecdote from Michael Barr relates the first use of the term:

  > (...) The attendance consisted of practically everyone in the world who had any interest in categories, with the notable exception of Charles Ehresmann. (...) One day at lunch or dinner I happened to be sitting next to Jean Benabou and he turned to me and said something like "How about 'monad'?" I thought about and said it sounded pretty good to me. (Yes, I did.) So Jean proposed it to the general audience and there was general agreement.

  The off-the-cuff nature of the suggestion, and immediate positive response from a large audience, suggests that there's probably no written record of the term being introduced formally. It's certainly possible that the word was borrowed from use in philosophy or elsewhere, but in any case there appears to be no connection more meaningful than the level of "cheap pun".

As far as I know, the only way you're going to get a better answer than that is by asking Bénabou himself.

edited Jun 21 '11 at 1:50   answered Jun 20 '11 at 20:15

camccann
339 ●2 ●7

---

2   excellent answer – FinnNk Jun 20 '11 at 20:20

1   I'm not sure I really care enough to follow up all those links, but I'm impressed. You must have taken some considerable trouble to chase all that down (please don't say *you* cared enough to have previously committed it to memory! :-) – FumbleFingers Jun 21 '11 at 2:16

1   @FumbleFingers: Haha, no! Just familiar enough with the subject matter to be *very efficient* at digging things up with Google. :] – camccann Jun 21 '11 at 2:29

     Lawvere, I believe, suggests that it is a contraction of "monoidal triad" in particular. In fact, the Mac Lane citation, if one reads one sentence earlier, also makes this suggestion, since it mentions "triad" and "monoid" as well as "triple". – sclv Nov 23 '12 at 7:38 ✎

"The name is taken from the mathematical monad construct in category theory."

In math the name probably came from the greek word "monos" meaning "single", "unit"

http://en.wikipedia.org/wiki/Monad_(functional_programming)

answered Jun 20 '11 at 6:27

mko
211 ●1 ●1

---

4   But then the question is, where did category theory get the name? – bdonlan Jun 20 '11 at 6:28

     Yeah, I found that wikipedia page before asking this, but I haven't been able to find the original source of the name. – Kurios Jun 20 '11 at 6:37

I believe that monads originated with Leibniz' metaphysical theory. Essentially, the monad acts as an interface between the worldly, corporeal and the spiritual, reflecting what happens on one side to the other and back.

Essentially an attempt to solve the mind-body problem.

As to why it was eventually snapped up in mathematical theor{y,ies} I do not know, but that is definitely what I think of when I hear "monad" (and monads in Haskell seem to share some of the qualities of Leibnizian monads).

answered Jun 20 '11 at 12:23

Vatine

---

1   I believe the connection is purely coincidental – FinnNk Jun 20 '11 at 20:20

1   No, Leibniz' monads are completely unrelated. – Marcin Jun 20 '11 at 20:24

I believe it is a backformation from dyad and triad.

A dyad is a couple, but not just any group of two. It is a group of two that forms a complete unit. A classical example is a group of friends with two people at the centre. They might be lovers, or roommates, classmates, or brothers. But everyone in the group is there because of one or the other of the dyad. Everyone has a tight connection to them. Often in a workplace there will be two people who form a dyad and the rest of the team forms around them. A triad is a group of three that rules something. Together the three of them form a ruling unit.

With those definitions in mind, what would a monad be? A single thing that is a thing all to itself. Sounds ok to me.

answered Jun 20 '11 at 15:35

Kate Gregory
7,988 ● 1 ● 22 ● 36

1   Cf. *decade*, *Iliad*. The Greek suffix *-as* (stem *-ad-*) is used to—ehm, it is hard to pin down. I'd say it makes something into an abstract unit that normally isn't one, like Latin *-tas*, gen. *-tat-*, as in *trinitas* ("trinity"), *unitas* ("unity"), and *paucitas* ("paucity"; from *pauci*, "few"). – Cerberus Jun 20 '11 at 20:16

"unity, arithmetical unit," 1610s, from L. monas (gen. monadis), from Gk. monas "unit," from monos "alone" (see mono-). In Leibnitz's philosophy, "an ultimate unit of being" (1748).

Reference

answered Jun 20 '11 at 15:57

Brad Christie

What the hell are monads? Your paragraph is "So, Monads"

answered Jun 20 '11 at 6:45

Sergey
172 ● 2 ● 8

1   Again, that says that it comes from the mathematical notion of a monad as well as defining the functions of the monad laws, but it doesn't give any insight to the origin of the name. – Kurios Jun 20 '11 at 6:52