

**Juliamono**

a monospaced programming font  
with reasonable Unicode support

<https://juliamono.netlify.app>

# JuliaMono Light

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

# JuliaMono Regular

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

# JuliaMono Medium

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

# JuliaMono Bold

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

# JuliaMono ExtraBold

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNOPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

# JuliaMono Black

abcdefghijklmnoprstuvwxyz 12345  
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{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

```
function _nloops(N::Int, itersym::Symbol, rangeexpr::Expr, args::Expr...)
    if rangeexpr.head !== :→
        throw(ArgumentError("second argument must be an anonymous function expression to compute the range"))
    end
    if !(1 ≤ length(args) ≤ 3)
        throw(ArgumentError("number of arguments must be 1 ≤ length(args) ≤ 3, got $nargs"))
    end
    body = args[end]
    ex = Expr(:escape, body)
    for dim = 1:N
        itervar = inlineanonymous(itersym, dim)
        rng = inlineanonymous(rangeexpr, dim)
        preexpr = length(args) > 1 ? inlineanonymous(args[1], dim) : (:(:nothing))
        postexpr = length(args) > 2 ? inlineanonymous(args[2], dim) : (:(:nothing))
        ex = quote
            for $(esc(itervar)) = $(esc(rng))
                $(esc(preexpr))
                $ex
                $(esc(postexpr))
            end
        end
    end
    ex
end

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                $ex
                $(esc(postexpr))
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```

## JuliaMono LightItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

## JuliaMono RegularItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

## JuliaMono MediumItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

## JuliaMono BoldItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

## JuliaMono ExtraBoldItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
{ } [ ] ( ) <> \$ \* - + = / # \_ % ^ @ \ & | ~ ? ' " ` ! , . ; :

## JuliaMono BlackItalic

abcdefghijklmnoprstuvwxyz 12345  
ABCDEFGHIJKLMNPQRSTUVWXYZ 67890  
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                $ex
                $(esc(postexpr))
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```



**Ancient Greek** Ἀδμηθ', ὁρῆς γὰρ τάμα πράγμαθ', ὡς ἔχει, λέξαι θέλω σοι πρὶν θανεῖν ἢ βούλομαι.

**Armenian** Իմ օդարինը լի է օճաճկերով

**Bulgarian** Я, пазачът Валю уж бди, а скришом хапва кюфтенца зад щайгите.

**Catalan** «Dóna amor que seràs feliç!». Això, il·lus company geniüt, ja és un lluït rètol blavís d'onze kWh.

**Czech** Zvlášť zákeřný učeň s dholičky běží podél zóny úlů

**Danish** Quizdeltagerne spiste jordbær med fløde, mens cirkusklovnen Walther spilledede på xylofon.

**English** Sphinx of black quartz, judge my vow.

**Estonian** Põdur Zagrebi tšellomängija-fölljetonist Ciço külmetas kehvas garaažis

**Finnish** Charles Darwin jammaili Åken hevixylofonilla Qatarin yöpub Zeligissä.

**French** Voix ambiguë d'un cœur qui au zéphyru préfère les jattes de kiwi.

**Georgian** სწრაფი ყავისფერი მეღა ახტება ზარმაც ძალებს.

**German** Victor jagt zwölf Boxkämpfer quer über den großen Sylter Deich.

**Greek** Ταχίστη αλώπηξ βαφής ψημένη γη, δρασκελίζει υπέρ νωθρού κυνός.

**Guarani** H̄ilandiagua kuñanguéra oho peteī sa'uju ypa'ūme Gavōme ombo'e hāg ua ingyleñe'ẽ mitānguérare ne'ēndy'ŷ.

**Hungarian** Jó foxim és don Quijote húszwattos lámpánál ülve egy pár bűvös cipőt készít.

**IPA** [gʷʃ?.nas.do:ŋ.kʰlja] [jan.n̥z̥i wo. ci uɛn.ɣwa]

**Icelandic** Kæmi ný öxi hér, ykist þjófum nú bæði víl og ádrepa.

**Irish** Čuaiġ bé mórsáċ le dlúitspád fiorfinn trí hata mo ðea-þorcáin ēig.

**Latvian** Muļķa hipiji mēģina brīvi nogaršot celofāna žņaudzējčūsku.

**Lithuanian** Įlinkdama fechtuotojo špaga sublykčiojusi pragrėžę apvalų arbūzą.

**Macedonian** Сидарски пејзаж: шугав билмез со чудење џвака ќофте и кељ на туѓ цех.

**Norwegian** Jeg begynte å fortære en sandwich mens jeg kjørte taxi på vei til quiz

**Polish** Pchnąć w tę łódź jeża lub ósm skrzyń fig.

**Portuguese** Luís argüia à Júlia que «brações, fé, chá, óxido, pôr, zângão» eram palavras do português.

**Romanian** Înjurând pițigăiat, zoofobul comandă vexat whisky și tequila.

**Russian** Широкая электрификация южных губерний даст мощный толчок подъёму сельского хозяйства.

**Scottish** Mus d'fhàg Cèit-Ùna ròp i le ob.

**Serbian** Ајшо, лепото и чежњо, за љубав срца мога дођи у Хаџиће на кафу.

**Spanish** Benjamín pidió una bebida de kiwi y fresa; Noé, sin vergüenza, la más champaña del menú.

**Swedish** Flygande bäckasiner söka hwila på mjuka tuvor.

**Turkish** Pijamalı hasta yağız şoföre çabucak güvendi.

**Ukrainian** Чуєш їх, доцю, га? Кумедна жти, прощайся без ғольфів!а





## contextual alternates

calt off	calt on
->	→
=>	⇒
>	▷
<	◁
::	::
-->	-->
<--	←
<-->	↔

## stylistic sets

zero	0	0	slashed zero
ss01	g	g	alternate g
ss02	@	@	alternate @
ss03	j	j	alternate j
ss04	ø	ø	alternate ø
ss05	*	*	lighter asterisk
ss06	a	a	simple a
ss07	`	`	smaller grave
ss08	→	→	distinct ligatures†
ss09	f	f	alternate f
ss10	r	r	alternate r
ss11	`	`	thinner grave
ss12	=====	=====	equal join (>= 4)
ss13	<!--	<!--	HTML comment
ss14	==	==	double equals
ss15	𝒜 Ḷ Ḯ	𝒜 Ḷ Ḯ	Math script: roundhand
ss16	[ ]( ){ }	[ ]( ){ }	Smaller parens

† with calt off

```
function tensorform(P::POMDP)
    S, A, O, R, T, O = P.S, P.A, P.O, P.R, P.T, P.O
    P' = eachindex(P)
    A' = eachindex(A)
    O' = eachindex(O)
    R' = [R(s,a) for s in S, a in A]
    T' = [T(s,a,s') for s in S, a in A, s' in S]
    O' = [O(a,s',o) for a in A, s' in S, o in O]
    return P', A', O', R', T', O'
end
```

 TAB

TAB  
u+e804

 Plots

Plots  
u+e833

 git compare

git compare  
u+e728

 julia dots

julia dots  
u+e800

 MIT

MIT  
u+e78b

 w

subscript w  
u+e812

 text

text  
u+e612

 git commit

git commit  
u+e729

 flux

flux  
u+e832

 powerline

powerline  
u+e0b0

 folder

folder  
u+e613

 hacker

hacker  
u+e826

 \*

subscript asterisk  
u+e809

 symbolix

symbolix  
u+e835

 b

subscript b  
u+e815

 C++

C++  
u+e61d

 git branch

git branch  
u+e725

 cormullion

cormullion  
u+e803

 gear

gear  
u+e615

 Vcat the pirate cat

Vcat the pirate cat  
u+e838

 eindhoven vibes

eindhoven vibes  
u+e81f

 α

subscript alpha  
u+e815

 powerline

powerline  
u+e0a3

 Differential Equations

Differential Equations  
u+e830

 git PR

git PR  
u+e726

 con

(julia) con  
u+e834

 Makie

Makie  
u+e831

 linux

linux  
u+e712

 g

subscript g  
u+e811

 Markdown

Markdown  
u+e609

 creative commons

creative commons  
u+e689

 windows

windows  
u+e62a

 julia

julia logo  
u+e801

 luxot

luxot  
u+e837

 Python

Python  
u+e606

 juliahub

juliahub  
u+e81e

 windows

windows  
u+fab2

 powerline

powerline  
u+e0b3

 Apple

Apple  
u+e611

 vim

vim  
u+e62b

 #

css  
u+e614

 powerline

powerline  
u+e0a0

 q

superscript q  
u+e807

 q

subscript q  
u+e806

 julia

julia  
u+e624

 powerline

powerline  
u+e0a1

 git merge

git merge  
u+e727

 ∞

infinity  
u+e817

 ||

subscript parallel  
u+e808

 powerline

powerline  
u+e0b1

 δ

subscript delta  
u+e816

 github

github  
u+e709

 z

subscript z  
u+e814

 powerline

powerline  
u+e0b2

 TAB

TAB  
u+e804

 plots

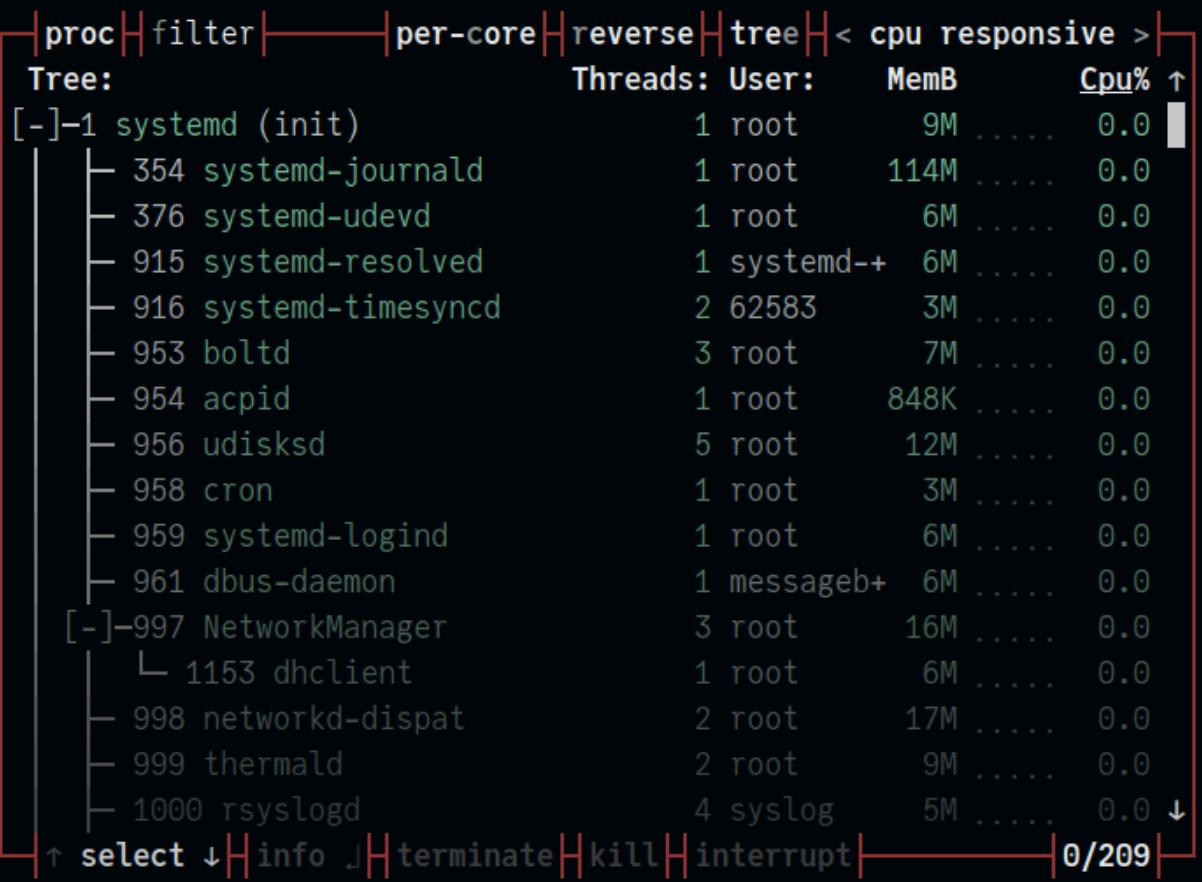
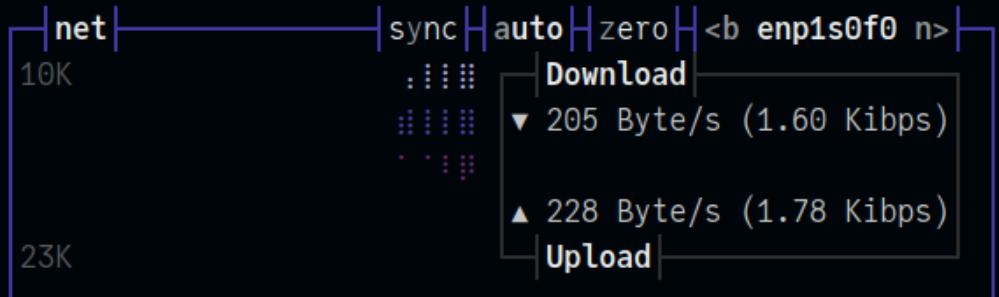
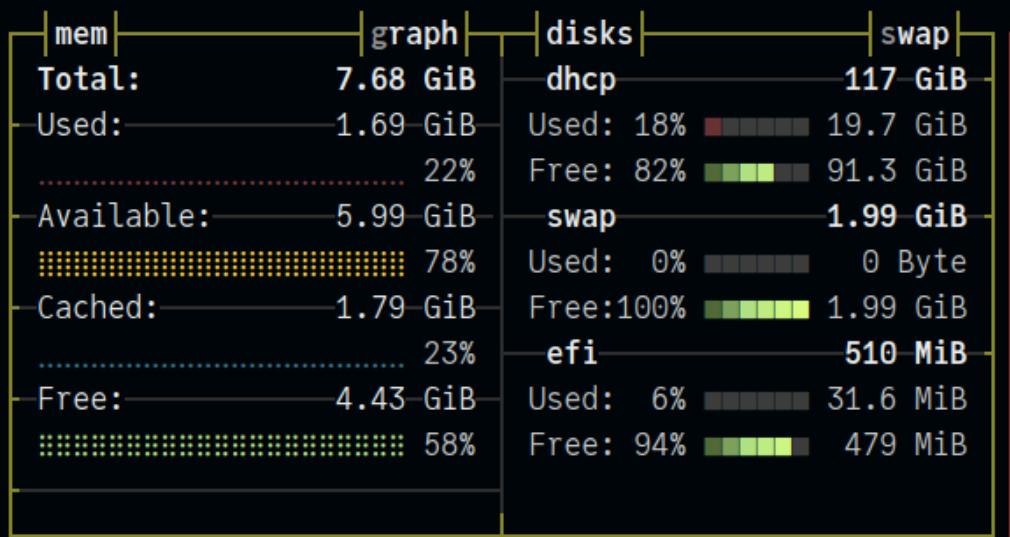
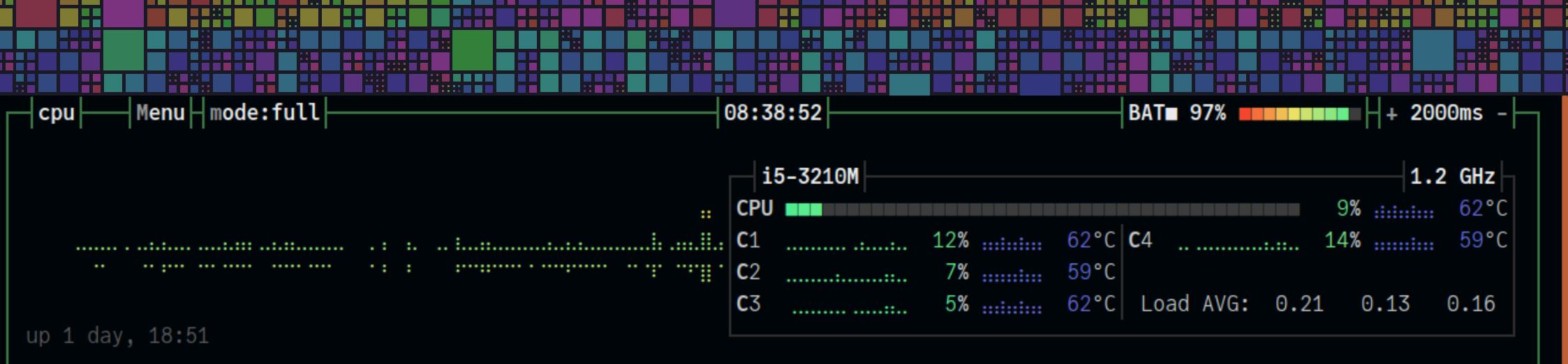
plots  
u+e833

JuliaMonos' Some characters from JuliaMonos' Private Use Areas

```
1 # This file is a part of Julia. License is MIT: https://julialang.org/license
2
3 # `ntuple`, for constructing tuples of a given length
4
5 ∵ """
6     ntuple(f::Function, n::Integer)
7
8 Create a tuple of length `n`, computing each element as `f(i)`,
9 where `i` is the index of the element.
10
11 # Examples
12 ````jldoctest
13 julia> ntuple(i → 2*i, 4)
14 (2, 4, 6, 8)
15 `````
16 """
17 ∵ @inline function ntuple(f::F, n::Integer) where F
18     # marked inline since this benefits from constant propagation of `n`
19 ∵     t = n == 0 ? () :
20         n == 1 ? (f(1),) :
21         n == 2 ? (f(1), f(2)) :
22         n == 3 ? (f(1), f(2), f(3)) :
23         n == 4 ? (f(1), f(2), f(3), f(4)) :
24         n == 5 ? (f(1), f(2), f(3), f(4), f(5)) :
25         n == 6 ? (f(1), f(2), f(3), f(4), f(5), f(6)) :
26         n == 7 ? (f(1), f(2), f(3), f(4), f(5), f(6), f(7)) :
27         n == 8 ? (f(1), f(2), f(3), f(4), f(5), f(6), f(7), f(8)) :
28         n == 9 ? (f(1), f(2), f(3), f(4), f(5), f(6), f(7), f(8), f(9)) :
29         n == 10 ? (f(1), f(2), f(3), f(4), f(5), f(6), f(7), f(8), f(9), f(10)) :
30             _ntuple(f, n)
31     return t
32 end
33
34 ∵ function _ntuple(f::F, n) where F
35     @noinline
```

```
@inline function _foldoneto(op, acc, ::Val{N}) where N
    @assert N::Integer > 0
    if @generated
        quote
            acc_0 = acc
            Base.Cartesian.@nexprs $N i → acc_{i} = op
            return $(Symbol(:acc_, N))
        end
    else
        for i in 1:N
            acc = op(acc, i)
        end
        return acc
    end
end
```

quote  
acc\_0 = acc  
Base.Cartesian.@nexprs \$N i → acc\_{i} = op  
return \$(Symbol(:acc\_, N))  
end  
else  
for i in 1:N  
acc = op(acc, i)  
end  
return acc  
end  
end





The title of the painting, which is known in English as *Mona Lisa*, comes from a description by Renaissance art historian Giorgio Vasari, who wrote "Leonardo undertook to paint, for Francesco del Giocondo, the portrait of *Mona Lisa*, his wife." *Mona* in Italian is a polite form of address originating as *ma donna* – similar to *Ma'am*, *Madam*, or *my lady* in English. This became *madonna*, and its contraction *mona*. The title of the painting, though traditionally spelled *Mona* (as used by Vasari), is also commonly spelled in modern Italian as *Monna Lisa* (*mona* being a vulgarity in some Italian dialects), but this is rare in English. Vasari's account of the *Mona Lisa* comes from his biography of Leonardo published in 1550, 31 years after the artist's death. It has long been the best-known source of information on the provenance of the work and identity of the sitter. Leonardo's assistant Salai, at his death in 1524, owned a portrait which in his personal papers was named *la Gioconda*, a painting bequeathed to him by Leonardo. That Leonardo painted such a work, and its date, were confirmed in 2005 when a scholar at Heidelberg University discovered a marginal note in a 1477 printing of a volume by ancient Roman philosopher Cicero. Dated October 1503, the note was written by Leonardo's contemporary Agostino Vespucci. This note likens Leonardo to renowned Greek painter Apelles, who is mentioned in the text, and states that Leonardo was at that time working on a painting of *Lisa del Giocondo*. In response to the announcement of the discovery of this document, Vincent Delieuvin, the Louvre representative, stated "Leonardo da Vinci was painting, in 1503, the portrait of a Florentine lady by the name of *Lisa del Giocondo*. About this we are now certain. Unfortunately, we cannot be absolutely certain that this portrait of *Lisa del Giocondo* is the painting of the Louvre." The model, *Lisa del Giocondo*, was a member of the Gherardini family of Florence and Tuscany, and the wife of wealthy Florentine silk merchant Francesco del Giocondo. The painting is thought to have been commissioned for their new home, and to celebrate the birth of their second son, Andrea. The Italian name for the painting, *La Gioconda*, means 'jocund' ('happy' or 'joyful') or, literally, 'the jocund one', a pun on the feminine form of *Lisa*'s married name, *Giocondo*. In French, the title *La Joconde* has the same meaning. Before that discovery, scholars had developed several alternative views as to the subject of the painting. Some argued that *Lisa del Giocondo* was the subject of a different portrait, identifying at least four other paintings as the *Mona Lisa* referred to by Vasari. Several other women have been proposed as the subject of the painting. Isabella of Aragon, Cecilia Gallerani, Costanza d'Avalos, Duchess of Francavilla, Isabella d'Este, Pacifica Brandano or Brandino, Isabela Gualanda, Caterina Sforza, Bianca Giovanna Sforza—even Salai and Leonardo himself—are all among the list of posited models portrayed in the painting. The consensus of art historians in the 21st century maintains the long-held traditional opinion that the painting depicts *Lisa del Giocondo*. History: Leonardo da Vinci had begun working on a portrait of *Lisa del Giocondo*, the model of the *Mona Lisa*, by October 1503. It is believed by some that the *Mona Lisa* was begun in 1503 or 1504 in Florence. Although the Louvre states that it was "doubtless painted between 1503 and 1506", art historian Martin Kemp says that there are some difficulties in confirming the dates with certainty. In addition, many Leonardo experts, such as Carlo Pedretti and Alessandro Vezzosi, are of the opinion that the painting is characteristic of Leonardo's style in the final years of his life, post-1513. Other academics argue that, given the historical documentation, Leonardo would have

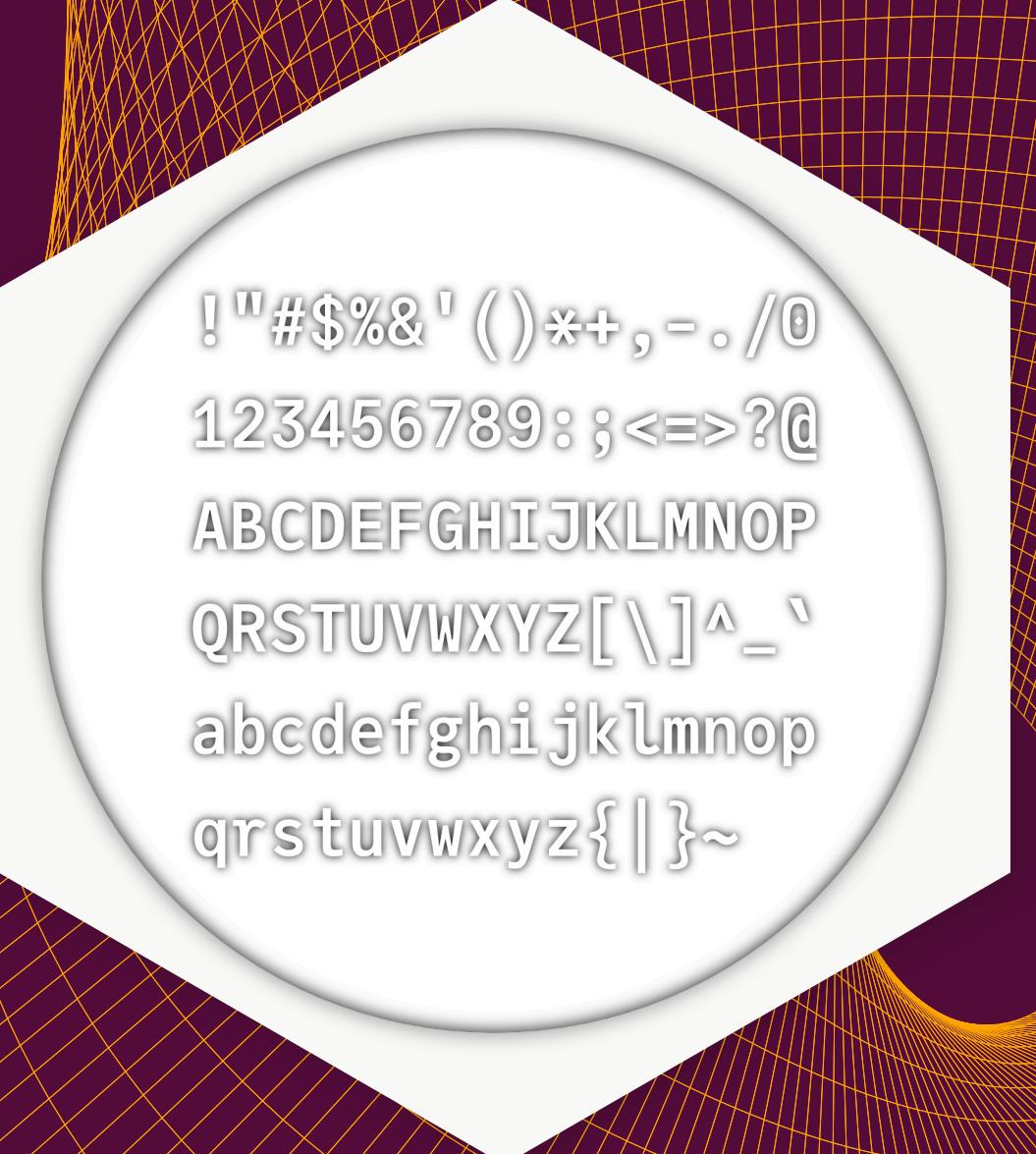
painted the work from 1513. According to Vasari, "after he had lingered over it four years, left it unfinished". In 1516, Leonardo was invited by King Francis I to work at the Clos Lucé near the Château d'Amboise; it is believed that he took the *Mona Lisa* with him and continued to work on it after he moved to France. Art historian Carmen C. Bambach has concluded that Leonardo probably continued refining the work until 1516 or 1517. Leonardo's right hand was paralytic circa 1517, which

2004. In view of this, Vincent Delieuvin, curator of 16th-century Italian painting at the Louvre, states that the sketch and these other copies must have been inspired by another version, while Zöllner states that the sketch may be after another Leonardo portrait of the same subject. The record of an October 1517 visit by Louis d'Aragon states that the *Mona Lisa* was executed for the deceased Giuliano de' Medici, Leonardo's steward at the Belvedere Palace between 1513 and

and assistant Salai's possession until his death in 1524. The second, commissioned by Giuliano de' Medici circa 1513, would have been sold by Salai to Francis I in 1548 and is the one in the Louvre today. Others believe that there was only one true *Mona Lisa*, but are divided as to the two aforementioned fates. At some point in the 16th century, a varnish was applied to the painting. It was kept at the Palace of Fontainebleau until Louis XIV moved it to the Palace of Versailles, where it remained until the French Revolution. In 1797, it was put on to permanent display at the Louvre. In the early 21st century, French scientist Pascal Cotte hypothesized a hidden portrait underneath the surface of the painting, circumstantial evidence for which was produced using reflective light technology. The underlying portrait appears to be of a model looking to the side, but lacks the flanking columns drawn by Raphael. Having been given access to the painting by the Louvre in 2004, Cotte spent ten years studying the painting with layer-amplification methods. However, the alleged portrait does not fit with historical descriptions of the painting: both Vasari and Gian Paolo Lomazzo describe the subject as smiling, unlike the subject in Cotte's portrait. Cotte admits that his reconstitution had been carried out only in support of his hypotheses and should not be considered as objective proof of an underlying portrait. Refuge, theft and vandalism After the French Revolution, the painting was moved to the Louvre, but spent a brief period in the bedroom of Napoleon (d. 1821) in the Tuileries Palace. The *Mona Lisa* was not widely known outside the art world, but in the 1800s, a portion of the French intelligentsia began to hail it as a masterpiece of Renaissance painting. During the Franco-Prussian War (1870–1871), the painting was moved from the Louvre to the Brest Arsenal. Vacant wall in the Louvre's Salon Carré after the painting was stolen in 1911 "*La Joconde est Retrouvée*" ("*Mona Lisa is Found*"), Le Petit Parisien, 13 December 1913. In 1911, the painting was still not popular among the lay-public. On 21 August 1911, the painting was stolen from the Louvre. The missing painting was first noticed the next day by painter Louis Béroud. After some confusion as to whether the painting was being photographed somewhere, the Louvre was closed for a week for investigation. French poet Guillaume Apollinaire came under suspicion and was arrested and imprisoned. Apollinaire implicated his friend Pablo Picasso, who was brought in for questioning. Both were later exonerated. The real culprit was Louvre employee Vincenzo Peruggia, who had helped construct the painting's glass case. He carried out the theft by entering the building during regular hours, hiding in a broom closet, and walking out with the painting hidden under his coat after the museum had closed. Peruggia was an Italian patriot who believed that Leonardo's painting should have been returned to an Italian museum. Peruggia may have been motivated by an associate whose copies of the original would significantly rise in value after the painting's theft. After having kept the *Mona Lisa* in his apartment for two years, Peruggia grew impatient and was caught when he attempted to sell it to Giovanni Poggi, director of the Uffizi Gallery in Florence. It was exhibited in the Uffizi Gallery for over two weeks and returned to the Louvre on 4 January 1914. Peruggia served six months in prison for the crime and was hailed for his patriotism in Italy. A year after the theft, Saturday Evening Post journalist Karl Decker met an alleged accomplice named Eduardo de Valfierno, who claimed to have masterminded the theft. Forger Yves Chaudron was to have created ... [text by Wikipedia contributors. "*Mona Lisa*." Wikipedia, The Free Encyclopedia.]

may indicate why he left the *Mona Lisa* unfinished. Circa 1505, Raphael executed a pen-and-ink sketch, in which the columns flanking the subject are more apparent. Experts universally agree that it is based on Leonardo's portrait. Other later copies of the *Mona Lisa*, such as those in the National Museum of Art, Architecture and Design and The Walters Art Museum, also display large flanking columns. As a result, it was thought that the *Mona Lisa* had been trimmed. However, by 1993, Frank Zöllner observed that the painting surface had never been trimmed; this was confirmed through a series of tests in

1516—but this was likely an error. According to Vasari, the painting was created for the model's husband, Francesco del Giocondo. A number of experts have argued that Leonardo made two versions (because of the uncertainty concerning its dating and commissioner, as well as its fate following Leonardo's death in 1519, and the difference of details in Raphael's sketch—which may be explained by the possibility that he made the sketch from memory). The hypothetical first portrait, displaying prominent columns, would have been commissioned by Giocondo circa 1503, and left unfinished in Leonardo's pupil



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JuliaMono Light

JuliaMono Regular

JuliaMono Medium

JuliaMono Bold

JuliaMono ExtraBold

JuliaMono Black

return \$(Symbol(:acc-\$1:N))

end

else

for

in 1:N

end

return acc

end

@nexprs

i → t

tuple t

else

= 1:N

val, ::Val{\_N}) where {\_N}

end

```

# inferable ntuple (enough for bootstrapping)
ntuple(f, ::Val{0}) = ()
ntuple(f, ::Val{1}) = (@_inline_meta; (f(1),))
ntuple(f, ::Val{2}) = (@_inline_meta; (f(1), f(2)))
ntuple(f, ::Val{3}) = (@_inline_meta; (f(1), f(2), f(3)))

@inline function ntuple(f::F, ::Val{N}) where {F,N}
    N::Int
    (N >= 0) || throw(ArgumentError(string("tuple length should be ≥ 0, got ", N)))
    if @generated
        quote
            @nexprs $N i → t_i = f(i)
            @ncall $N tuple t
        end
    else
        Tuple(f(i) for i = 1:N)
    end
end

```

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```

@inline function fill_to_length(t::Tuple, val, ::Val{_N}) where {_N}
    M = length(t)
    N = _N::Int
    M > N && throw(ArgumentError("input tuple of length $M, requested $N"))
    if @generated
        quote
            (t..., $(fill(:val, (_N::Int) - length(t.parameters))...))
        end
    else
        Tuple(val for i = 1:N)
    end
end

```