

### Install zawk

```
$ cargo install zawk
$ brew install linux-china/tap/zawk
$ sudo xattr -r -d com.apple.quarantine $(readlink -f $(brew --prefix zawk))/bin/zawk
```

### how to run zawk?

```
$ zawk 'BEGIN { print strftime(), whoami() }'
$ zawk -f demo.awk demo.txt
```

### String functions: utf-8 by default

length(s)	Length of s: utf-8 format
char_at(\$1, 1)	Get char at index, starts from 1
match(s, re)	if string s matches the regular expression
substr(s, i[, j])	1-indexed substring of string s
sub(re, t, s)	Substitutes t for the first matching occurrence of regular
gsub(re, t, s)	Like sub, but with all occurrences substituted, not just the first.
index(s,t)	Position in string s where string t occurs, 0 if not found
last_index(s,t)	Last position in string s where string t occurs, 0 if not found
split(s, m[, fs])	Splits the string s according to fs, placing the results in the array m.
sprintf(fmt, s, ...)	Returns a string formatted according to fmt and provided arguments

### String functions: utf-8 by default (cont)

printf(fmt, s, ...) [>] out]	Like sprintf but the result of the operation is written to standard output
hex(s)	Returns the hexadecimal integer (e.g. 0x123abc)
join_fields(i, j[, sep])	Returns columns i through j (1-indexed, inclusive) concatenated
join_csv(i, j)	Like join_fields but with columns joined by comma
join_tsv(i, j)	Like join_fields but with columns joined by tabs
tolower(s)	Returns a copy of s where all lowercase ASCII characters
toupper(s)	Returns a copy of s where all uppercase ASCII characters
strtonum(s)	numeric value(Decimal) strtonum("0x11")
trim(s), trim(s, "[]")	Trim text with space by default
truncate(s,10)	Truncate s with width fixed
capitalize(s)	Capitalize first character of s
uncapitalize(s)	Uncapitalize first character of s
camel_case(s)	Return camel case of s: helloWorld
kebab_case(s)	Return kebab case of s: hello-world
snake_case(s)	Return snake case of s: hello_world



### String functions: utf-8 by default (cont)

<code>title_case(s)</code>	Return kebab case of s: Hello World
<code>isint(s)</code>	Integer(64) or not for s
<code>isnum(s)</code>	Number(int or float) or not for s
<code>starts_with(s, prefix)</code>	Check s start with prefix or not
<code>ends_with(s, suffix)</code>	Check s end with prefix or not
<code>contains(s, child)</code>	Check s contains with prefix or not
<code>mask(s)</code>	Mask some sensitive text, such as email, phone
<code>pad(s, 10, "")</code>	Pad s with width and place holder
<code>strcmp(s1, s2)</code>	Compare 2 text
<code>words(s)</code>	Text to words array
<code>repeat("**", 3)</code>	Repeat text with times
<code>default_if_empty(s, "0")</code>	Return default value if text is empty or not exist.
<code>append_if_missing(s, "/")</code>	Add suffix if missing
<code>prepend_if_missing(s, "https://")</code>	Add prefix if missing
<code>remove_if_begin("./demo.json", ".")</code>	Remove prefix if available
<code>remove_if_end("demo.json", ".json")</code>	Remove suffix if available
<code>quote(s)</code>	Quote text if not quoted.
<code>double_quote(s)</code>	Double quote text if not quoted.
<code>format_bytes(size)</code>	Format bytes size: 10.1 MB
<code>to_bytes("10.2 MB")</code>	Convert bytes format to size

### String functions: utf-8 by default (cont)

<code>escape(format, s)</code>	Escape s with format: json, csv, tsv, xml, sql, shell
<code>escape_csv(s)</code>	Escape s with CSV
<code>last_part(text, sep)</code>	Get last part with separator
<code>parse(text, template)</code>	Parse text with wild match
<code>rparse(text, regex)</code>	Parse text with regex match group
<code>fake(data, locale)</code>	Generate fake data by locale
<code>mkpass(length)</code>	Generate password

- parse: use wild match - `parse(" Hello World", "{greet}{name} ")["greet"]`

- rparse: use regex group - `rparse("Hello World", "(\\w+)(\\w+) ")[1]`

# fake function restriction

\* data: name, phone, cell, email, ip,creditcard,wechat,id,zipcode,plate

\* locale: en, cn

### Text Parser

<code>url("https://example.com/path")</code>	Parse s to URL array: schema, user, host, port ...
<code>data_url("data:text/plain;base64,xxxx")</code>	Parse data url: <code>data_url("data:text/plain;base64,SGVsbG8sIFdvcmxkIQ==")</code>
<code>shlex("ls -al")</code>	Parse command line to array
<code>path("./demo.txt")</code>	Parse path
<code>semver("1.2.3-alpha")</code>	Parse semantic version
<code>pairs("id=1&amp;name=Hello%20Wo")</code>	Parse url query or normal pairs: "a=b,c=d"
<code>record("requests_total{code=\"200\"}")</code>	Parse pairs with name, such as Prometheus
<code>message("name{a=1}")</code>	Parse message: name, headers and body (body)"
<code>func("hello(1,2,3)")</code>	Parse function call
<code>flags("{vip,top20}")</code>	Parse flags
<code>variant("week(5)")</code>	Parse variant
<code>tuple(("first",1))</code>	Parse tuple



### Text Parser (cont)

`parse_array(["first','second'])` Parse array

### I/O functions

`read_all(file_path)` Read file into text

`write_all(file_path, text)` Write text into file

`getline()` Read line from file

getline:

- [https://www.gnu.org/software/gawk/manual/html\\_node/Getline.html](https://www.gnu.org/software/gawk/manual/html_node/Getline.html)

- <http://awk.freeshell.org/AllAboutGetline>

### OS functions

`system(cmd)` Execute cmd and return exit status

`whoami()` user name

`os()` OS name

`arch()` such as x86\_64, aarch64 ...

`os_family()` unix or windows

`pwd()` Current working directory

`user_home()` User home directory

### Database functions

`sqlite_query("sqlite.db",sql)` SQLite query: return value is array of CSV lines

`sqlite_execute("sqlite.db", sql)` SQLite execute

`libsql_query("http://localhost:-8080",sql)` libSQL query: return value is array of CSV lines

`libsql_execute("http://localhost:8080", sql)` libSQL execute

`mysql_query(url, sql)` MySQL query: return value is array of CSV lines

`mysql_execute(url, sql)` MySQL execute

MySQL url: `mysql://root:123456@localhost:3306/test`

### Misc commands

# dump prometheus text to CSV

\$ `zawk dump --prometheus http://localhost:8080/actuator/prometheus`

# parse CSV

\$ `zawk -f demo.awk -i csv demo.csv`

# Nushell

\$ `ls | to csv | ^zawk -i csv '{print $1}'`

### AWK & Friends

grep <https://www.gnu.org/s/grep/manual/grep.html>

sed <https://www.gnu.org/software/sed/manual/sed.html>

DuckDB <https://duckdb.org/>

xsv <https://github.com/BurntSushi/xsv>

jq <https://jqlang.github.io/jq/>

### ID generator

`uuid()/uuid("v7")` Generate uuid: 128 bits

`ulid()` Generat ulid: 128 bits

`tsid()` Generate TSID

`snowflake(machine_id)` Generate snowflake: 64 bits, max value for machine\_id is 65535

### Array functions

`length(arr)` Length of array

`delete arr[1] / delete arr` Delete array item or array

`seq(start, end, step)` Generate sequence array: seq command compatible

`uniq(arr)` Unique items of array: uniq command compatible

`_ = asort(arr)` Sort array items by asc

`_max(arr)` Return max value of number array

`_min(arr)` Return min value of number array

`_sum(arr)` Return sum value of number array



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Published 15th March, 2024.

Last updated 6th September, 2024.

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### Array functions (cont)

<code>_mean(arr)</code>	Return man value of number array
<code>_join(arr, ",")</code>	Join array items to string
<code>bf_insert(item)</code>	Bloom filter insert
<code>bf_contains(item)</code>	Bloom filter contains
<code>bf_icontains(item)</code>	Bloom filter contains with insertion if not found

Bloom filter:

- `bf_insert(item,group)`
- `bf_contains(item,group)`
- `bf_icontains(item,group)`

### Math functions

<code>rand()</code>	Random float number between 0 and 1
<code>srand(x)</code>	Seeds the random number generator used by <code>rand</code>
<code>abs(x)</code>	Absolute value of x
<code>floor(x)</code>	Return int floor value of x
<code>ceil(x)</code>	Return int ceil value of x
<code>round(x)</code>	Return int round value of x
<code>fend(expression)</code>	Calculate by fend: <a href="https://github.com/printfn/fend">https://github.com/printfn/fend</a>
<code>min(x,y,z)</code>	Return min value of x, y, z
<code>max(x,y,z)</code>	Return max value of x, y, z
<code>mkbool(s)</code>	Return 0 or 1 for bool string: false, true, Y, N ...
<code>int(s)</code>	Convert s to int
<code>float(s)</code>	Convert s to float

### Date/Time functions

<code>systeme()</code>	Current unix time
<code>strftime()/strfttime(p, timestamp)</code>	Format timestamp by pattern
<code>mktime(s)</code>	Parse s to unix timestamp
<code>datetime(s)</code>	Parse s to date/time array

### Date/Time functions (cont)

<code>duration("2min + 12sec")</code>	Parse expression to duration in seconds
strftime pattern: <a href="https://docs.rs/chrono/latest/chrono/format/strftime/index.html">https://docs.rs/chrono/latest/chrono/format/strftime/index.html</a>	
date/time parse: <a href="https://docs.rs/dateparser/latest/dateparser/#accepted-date-formats">https://docs.rs/dateparser/latest/dateparser/#accepted-date-formats</a>	
date/time array:	
- year:	2024
- month:	1, 2
- monthday:	24
- hour	
- minute	
- second	
- yearday	
- weekday	
- hour:	1-24
- althour:	1-12

### JSON/CSV functions

<code>from_json(json_text)</code>	Parse json text to array
<code>to_json(arr)</code>	Output array as json text
<code>from_csv(line)</code>	Parse CSV line to array
<code>to_csv(arr)</code>	Output array as CSV line

### Encode/Decode functions

<code>encode(format, s)</code>	Encode s with format
<code>decode(format, s)</code>	Decode s with format

Formats:

- hex, url, base32/58/64, base64url
- base64-hex, hex-base64
- zlib2base64url: zlib then base64url, good for online diagram service, such as PlantUML, Kroki

### Crypto functions

<code>digest(algorithm, s)</code>	Digest s with algorithm
<code>hmac(algorithm, secret-key, s)</code>	hmac s with: HmacSHA256, HmacSHA512
<code>jwt("HS256", secret-key, arr-payload)</code>	Generate JWT token: HS256, HS384, HS512
<code>dejwt(secret-key, token)</code>	Verify JWT token and return payload array
<code>encrypt("aes-128-cbc", "Secret Text", "pass_key")</code>	Encrypt secret text



### Crypto functions (cont)

`decrypt("aes-128-cbc", "7b9c07..", "pass_key")` Decrypt to plain text

Digest algorithm:

- md5, sha256, sha512
- bcrypt
- murmur3, xxh32, xxh64, blake3
- crc32, adler32

AES algorithm:

- aes-128-cbc, aes-256-cbc
- aes-128-gcm, aes-256-gcm

iv required gcm: `encrypt("aes-128-gcm", "Secret Text", "pass_key", "your_iv")`

### Network functions

`http_get(url, headers)` Return HTTP response

`http_post(url, headers, body)` Return HTTP response

`s3_get(bucket, object_name)` Return the text value of object

`s3_put(bucket, object_name, body)` Put the text body to s3 bucket

`publish("nats://host:4222/topic", body)` Publish message to NATS

`local_ip()` Return local ip of host

Environment variables for S3 access:

- S3\_ENDPOINT
- S3\_ACCESS\_KEY\_ID
- S3\_ACCESS\_KEY\_SECRET
- S3\_REGION

### KV functions

`kv_get(ns, key)` Get value by namespace and key

`kv_put(ns, key, value)` Put value by namespace and key

`kv_delete(ns, key)` Delete value by namespace and key

`kv_clear(ns)` Clear all keys

KV support by SQLite, Redis and NATS:

- SQLite: ns is normal name, such as "cluster1", "app1"
- Redis: ns is `redis://localhost:6379/0/namespace`
- NATS: ns is `nats://localhost:4222/bucket_name`

### Color

`hex2rgb("#FF0000")` Convert hex color to RGB array

`rgb2hex(r,g,b)` Convert RGB to hex

### Misc functions

`var_dump(value)` Dump and output variable to console with json format

`log_debug(msg)/log_info/log_warn/log_error` Log s and output to console

`isarray(x)` Is array or not

`typeof(x)` Type name of x: array, number, string, unassigned

### References

AWK Cheat Sheet <https://cheatsheets.zip/awk>

Awk in 20 Minutes <https://ferd.ca/awk-in-20-minutes.html>

Gawk: Effective AWK Programming <https://www.gnu.org/software/gawk/manual/>

