**Terraform Function Reference**

Here's a categorized list of different Terraform functions along with their purposes, useful for simplifying and transforming data in your Terraform configurations:

**🔤 String Functions**

| **Function** | **Purpose** |
| --- | --- |
| join() | Joins list items into a single string using a delimiter. |
| split() | Splits a string into a list using a delimiter. |
| length() | Returns length of a string, list, or map. |
| lower() | Converts all characters in a string to lowercase. |
| upper() | Converts all characters in a string to uppercase. |
| trimspace() | Removes leading/trailing whitespace. |
| replace() | Replaces substring in a string using a regex. |
| format() | Formats strings similarly to printf. |
| formatlist() | Formats each item in a list of values. |

**🔢 Numeric Functions**

| **Function** | **Purpose** |
| --- | --- |
| abs() | Returns absolute value. |
| ceil() | Rounds up to the nearest integer. |
| floor() | Rounds down to the nearest integer. |
| max() | Returns the maximum value. |
| min() | Returns the minimum value. |
| parseint() | Converts a string to a number (with base). |
| pow() | Raises a number to a power. |

**🧮 Collection Functions (List/Map/Set)**

| **Function** | **Purpose** |
| --- | --- |
| concat() | Combines multiple lists into one. |
| flatten() | Flattens a list of lists into a single list. |
| distinct() | Removes duplicates from a list. |
| sort() | Sorts a list of strings. |
| contains() | Checks if a list contains a value. |
| lookup() | Retrieves value by key from a map. |
| merge() | Merges multiple maps into one. |
| keys() | Returns all keys from a map. |
| values() | Returns all values from a map. |
| zipmap() | Creates a map from two lists (keys and values). |

**🧠 Encoding/Decoding Functions**

| **Function** | **Purpose** |
| --- | --- |
| base64encode() | Encodes a string to Base64. |
| base64decode() | Decodes a Base64 string. |
| jsonencode() | Converts a value into a JSON string. |
| jsondecode() | Parses a JSON string into a structured value. |

**📁 File Functions**

| **Function** | **Purpose** |
| --- | --- |
| file() | Loads the content of a file as a string. |
| filebase64() | Loads a file and encodes its contents in base64. |
| templatefile() | Renders a file as a Terraform template with variables. |

**📐 Network Functions**

| **Function** | **Purpose** |
| --- | --- |
| cidrsubnet() | Calculates subnet addresses within a CIDR range. |
| cidrhost() | Finds a host IP address in a CIDR range. |
| cidrnetmask() | Returns the netmask for a CIDR range. |
| cidrbroadcast() | Returns broadcast address of a CIDR block. |

**⚙️ Type Conversion & Utility Functions**

| **Function** | **Purpose** |
| --- | --- |
| tostring() | Converts a value to a string. |
| tolist() | Converts a value to a list. |
| tomap() | Converts a value to a map. |
| toset() | Converts a value to a set. |
| type() | Returns the type of a value. |

**🔄 Conditional and Logic Functions**

| **Function** | **Purpose** |
| --- | --- |
| coalesce() | Returns the first non-null value. |
| coalescelist() | Returns the first non-empty list. |
| can() | Checks if an expression is valid (returns true or false). |
| try() | Tries expressions in order and returns the first that doesn't error. |