Package 'strength'

February 25, 2026

Title Operations Designed for Tidy Strength Data

Version 0.1.0

Description Mappings for estimated one rep max from commonly used formulas.
Convenience functions for turning mass/rep/set data into useful derived
quantities.

License GPL (>= 3)

Encoding UTF-8

RoxygenNote 7.3.3

Depends R (>= 4.1)

LazyData true

Imports cli, dplyr, tibble, tidyr

Suggests testthat (>= 3.0.0)

Config/testthat/edition 3

URL https://github.com/alexpaynter/strength

BugReports https://github.com/alexpaynter/strength/issues

NeedsCompilation no

Author Alex Paynter [aut, cre, cph]

Maintainer Alex Paynter <apaynter@pm.me>

Repository CRAN

Date/Publication 2026-02-25 10:40:02 UTC

Contents

---

create_map_rep_rpe_to_pct

Create a mapping from reps and rpe to pct_1rm

Description

Create a mapping from reps and rpe to pct_1rm

Usage

```
create_map_rep_rpe_to_pct(pct_lookup_tab)
```

Arguments

pct_lookup_tab   A lookup table that contains columns reps, rpe and pct_1rm.

Value

A function taking arguments reps and rpe, returning a numeric vector.

Examples

```
resulting_function <- create_map_rep_rpe_to_pct(pct_lookup_rts)
```

---

e1rm   *Estimated one rep max*

Description

Estimated one rep max

Usage

```
e1rm(weight, reps, rpe, pct1rm_func)

e1rm_rts(...)

e1rm_helms(...)

e1rm_brzycki(...)
```

Arguments

`weight`	Numeric vector of weights, one entry per set.
`reps`	Numeric vector of reps, one entry per set.
`rpe`	Numeric vector of RPEs, one entry per set.
`pct1rm_func`	A function which takes `reps,rpe` and returns an estimated percentage of one rep max.
`...`	Arguments passed to `e1rm()`.

Value

A numeric vector of estimated one rep max values for each set.

Examples

```
e1rm(c(400, 300), c(1, 10), c(9, 6), pct1rm_rts)
e1rm_rts(c(400, 300), c(1, 10), c(9, 6))
e1rm_helms(c(400, 300), c(1, 10), c(9, 6))
e1rm_brzycki(c(400, 300), c(1, 10), c(9, 6))
```

---

hard_sets   *Number of hard sets*

Description

Number of hard sets

Usage

```
hard_sets(rpe, cutoff = 7)
```

Arguments

`rpe`	A numeric vector of set RPE values.
`cutoff`	RPE cutoff for what qualifies as a hard set. The boundary is included.

Value

A numeric value counting the number of hard sets.

Examples

```
hard_sets(c(6, 7, 10, 9, NA))
```

---

pct1rm_rts   *Mapping from reps and rpe to pct_1rm.*

Description

pct1rm_rts() uses the table provided by reactive training systems. pct1rm_helms() uses the table provided in a paper by Helms and colleagues. pct1rm_brzycki() uses the table provided by Brzycki in his book.

Usage

```
pct1rm_rts(reps, rpe)

pct1rm_helms(reps, rpe)

pct1rm_brzycki(reps, rpe)
```

Arguments

reps   A vector of repetitions performed in a set.

rpe   A vector of ratings of perceived exertion.

Details

reps must be length 1 or the same length as rpe. RPE must be length 1 or the same length as reps.

Value

A numeric vector listing the percentage of one 1 rep max.

Examples

```
pct1rm_rts(reps = 10, rpe = 8)
resulting_function <- create_map_rep_rpe_to_pct(pct_lookup_rts)
pct1rm_helms(reps = 5, rpe = 8)
resulting_function <- create_map_rep_rpe_to_pct(pct_lookup_rts)
pct1rm_helms(reps = 5, rpe = 8)
resulting_function <- create_map_rep_rpe_to_pct(pct_lookup_brzycki)
```

---

pct_lookup_brzycki *Percentage lookup from Brzycki.*

Description

Percentage lookup from Brzycki.

Usage

```
pct_lookup_brzycki
```

Format

pct_lookup_brzycki:

A data frame with 135 rows and 3 columns:

reps Number of reps performed

rpe Rating of perceived exertion

pct_1rm Percentage of one-repetition maximum associated with reps at rpe.

Source

Derived from rpe_tab_brzycki.

---

pct_lookup_helms *Percentage lookup from Helms and colleagues.*

Description

Percentage lookup from Helms and colleagues.

Usage

```
pct_lookup_helms
```

Format

pct_lookup_helms:

A data frame with 90 rows and 3 columns:

reps Number of reps performed

rpe Rating of perceived exertion

pct_1rm Percentage of one-repetition maximum associated with reps at rpe.

Source

Derived from rpe_tab_helms.

---

pct_lookup_rts   *Percentage lookup from reactive training systems (RTS)*

Description

Percentage lookup from reactive training systems (RTS)

Usage

```
pct_lookup_rts
```

Format

`pct_lookup_rts`:

A data frame with 165 rows and 5 columns:

reps Number of reps performed

rpe Rating of perceived exertion

pct_1rm Percentage of one-repetition maximum associated with `reps` at `rpe`.

Source

Derived from `rpe_tab_rts`.

---

rpe_tab_brzycki   *RPE table from Brzycki.*

Description

RPE table from Brzycki.

Usage

```
rpe_tab_brzycki
```

Format

`rpe_tab_brzycki`:

A dataframe with 9 rows and 16 columns.

RPE The rating of perceived exertion

1 Estimated percentage of one rep max doing 1 rep at the RPE given by RPE.

2 Estimated percentage of one rep max doing 2 reps at the RPE given by RPE.'

... And so on...

Source

ISBN 978-1935628132, "A practical approach to strength training". This is a rep-max resource and we extended to RPE using the reps in reserve definition for RPE (see `rep_tab_helms` for a paper link that explains this.)

---

rpe_tab_helms   *RPE table Helms and colleagues.*

Description

RPE table Helms and colleagues.

Usage

```
rpe_tab_helms
```

Format

`rpe_tab_helms`:

A dataframe with 10 rows and 11 columns.

RPE The rating of perceived exertion

1 Estimated percentage of one rep max doing 1 rep at the RPE given by RPE.

2 Estimated percentage of one rep max doing 2 reps at the RPE given by RPE.'

... And so on...

Source

https://doi.org/10.1519/SSC.0000000000000218. Based on earlier work by Zourdos and Helms

---

rpe_tab_rts   *RPE table RTS*

Description

RPE table RTS

Usage

```
rpe_tab_rts
```

Format

rpe_tab_rts:

A dataframe with 11 rows and 16 columns.

RPE The rating of perceived exertion

1 Estimated percentage of one rep max doing 1 rep at the RPE given by RPE.

2 Estimated percentage of one rep max doing 2 reps at the RPE given by RPE.'

... And so on...

Source

Pulled from the TRAC system on Reactive Training Systems in Dec 2025

---

rpe_tab_to_lookup   *RPE table to lookup table*

Description

RPE table to lookup table

Usage

```
rpe_tab_to_lookup(rpe_tab)
```

Arguments

rpe_tab   A tibble with columns RPE, 1, 2, 3, ... containing the percentage of one rep max
                 associated with doing x reps at RPE rating of perceived exertion.

Value

A tibble with columns rpe, reps, pct_1rm.

Examples

```
rpe_tab_to_lookup(rpe_tab_rts)
```

Index