

Football Analytics using {worldfootballR}

1 Loading Packages

```
library(pacman)
p_load(tidyverse, readxl, worldfootballR)
```

2 Get the Team data from URLs or Country Name

```
epl_2020 <- tm_league_team_urls(country_name = "England", start_year = 2020)
league_one_2024 <- tm_league_team_urls(start_year = 2024, league_url = "https://www.transfermarkt.com")

nigeria_lg_2023 <- tm_league_team_urls(country_name = "Nigeria", start_year = 2023)
nigeria_lg_2023 |>
  head()
```

```
[1] "https://www.transfermarkt.com/kano-pillars/startseite/verein/6799/saison_id/2023"
[2] "https://www.transfermarkt.com/enyimba-aba/startseite/verein/645/saison_id/2023"
[3] "https://www.transfermarkt.com/remo-stars-fc/startseite/verein/60222/saison_id/2023"
[4] "https://www.transfermarkt.com/lobi-stars-fc/startseite/verein/6907/saison_id/2023"
[5] "https://www.transfermarkt.com/shooting-stars-sc/startseite/verein/5739/saison_id/2023"
[6] "https://www.transfermarkt.com/rivers-united-fc/startseite/verein/53321/saison_id/2023"
```

3 Get the Squad Statistics from Team URLs

```
manu_team_2020 <- tm_squad_stats(team_url = epl_2020[4])
manu_team_2020 |>
  select(!contains('url')) |>
  head()
```

	team_name	league	country	player_name	player_pos	player_age
1	Manchester United	Premier League	England	Dean Henderson	Goalkeeper	23
2	Manchester United	Premier League	England	David de Gea	Goalkeeper	29
3	Manchester United	Premier League	England	Sergio Romero	Goalkeeper	33
4	Manchester United	Premier League	England	Joel Pereira	Goalkeeper	24
5	Manchester United	Premier League	England	Nathan Bishop	Goalkeeper	20
6	Manchester United	Premier League	England	Lee Grant	Goalkeeper	37

	nationality	in_squad	appearances	goals	minutes_played
1	England	61	26	0	2325
2	Spain	51	36	0	3225
3	Argentina	0	0	0	0
4	Portugal	0	0	0	0
5	England	3	0	0	0
6	England	21	0	0	0

4 Get the Staffs of a Team

```
epl_managers <- tm_team_staff_urls(team_urls = epl_2020, staff_role = "Manager")
epl_managers |> head()
```

```
[1] "https://www.transfermarkt.com/pep-guardiola/profil/trainer/5672"
[2] "https://www.transfermarkt.com/arne-slot/profil/trainer/34822"
[3] "https://www.transfermarkt.com/enzo-maresca/profil/trainer/53749"
[4] "https://www.transfermarkt.com/ruben-amorim/profil/trainer/65202"
[5] "https://www.transfermarkt.com/ange-postecoglou/profil/trainer/11929"
[6] "https://www.transfermarkt.com/mikel-arteta/profil/trainer/47620"
```

5 League Season Level Data

```
epl_matchday_38_table <- tm_matchday_table(country_name = "England", start_year= "2023", matchday= 38)
epl_matchday_38_table |> head()
```

	country			league	matchday	rk		squad	p
1	England	Games of Matchday	38	Premier League	23/24	38	1	Man City	38
2	England	Games of Matchday	38	Premier League	23/24	38	2	Arsenal	38
3	England	Games of Matchday	38	Premier League	23/24	38	3	Liverpool	38
4	England	Games of Matchday	38	Premier League	23/24	38	4	Aston Villa	38
5	England	Games of Matchday	38	Premier League	23/24	38	5	Tottenham	38
6	England	Games of Matchday	38	Premier League	23/24	38	6	Chelsea	38

	w	d	l	gf	ga	g_diff	pts
1	28	7	3	96	34	62	91
2	28	5	5	91	29	62	89
3	24	10	4	86	41	45	82
4	20	8	10	76	61	15	68
5	20	6	12	74	61	13	66
6	18	9	11	77	63	14	63

```
laliga_matchday_38_table <- tm_matchday_table(country_name = "Spain", start_year= "2023", ma
laliga_matchday_38_table |> head()
```

	country			league	matchday	rk		squad	p	w
1	Spain	Games of Matchday	38	LaLiga	23/24	38	1	Real Madrid	38	29
2	Spain	Games of Matchday	38	LaLiga	23/24	38	2	Barcelona	38	26
3	Spain	Games of Matchday	38	LaLiga	23/24	38	3	Girona	38	25
4	Spain	Games of Matchday	38	LaLiga	23/24	38	4	Atlético Madrid	38	24
5	Spain	Games of Matchday	38	LaLiga	23/24	38	5	Athletic	38	19
6	Spain	Games of Matchday	38	LaLiga	23/24	38	6	Real Sociedad	38	16

	d	l	gf	ga	g_diff	pts
1	8	1	87	26	61	95
2	7	5	79	44	35	85
3	6	7	85	46	39	81
4	4	10	70	43	27	76
5	11	8	61	37	24	68
6	12	10	51	39	12	60

6 Expiring Contracts

```
# laliga_expiring <- tm_expiring_contracts(country_name = "Spain", contract_end_year = 2022)
# laliga_expiring
```

7 League Injuries

```
laliga_injuries <- tm_league_injuries(country_name = "Spain")
laliga_injuries |> head()
```

```
  comp_name country
1   LaLiga   Spain
2   LaLiga   Spain
3   LaLiga   Spain
4   LaLiga   Spain
5   LaLiga   Spain
6   LaLiga   Spain

                                comp_url
1 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1
2 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1
3 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1
4 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1
5 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1
6 https://www.transfermarkt.com/laliga/startseite/wettbewerb/ES1

  player_name
1   Ferland Mendy
2  Álvaro Odriozola
3  SHERALDO BECKER
4   Aitor Paredes
5   Oihan Sancet
6    Dani Vivian

                                player_url
1 https://www.transfermarkt.com/ferland-mendy/profil/spieler/291417
2 https://www.transfermarkt.com/alvaro-odriozola/profil/spieler/280730
3 https://www.transfermarkt.com/sheraldo-becker/profil/spieler/188888
4 https://www.transfermarkt.com/aitor-paredes/profil/spieler/591916
5 https://www.transfermarkt.com/oihan-sancet/profil/spieler/571020
6 https://www.transfermarkt.com/dani-vivian/profil/spieler/524000

  position  current_club age nationality second_nationality
1  Left-Back   Real Madrid  29      France              Senegal
2  Right-Back  Real Sociedad  29       Spain              <NA>
3  Left Winger  Real Sociedad  30  Suriname              Netherlands
4  Centre-Back Athletic Bilbao  24       Spain              <NA>
5 Attacking Midfield Athletic Bilbao  24       Spain              <NA>
6  Centre-Back Athletic Bilbao  25       Spain              <NA>

  injury injured_since injured_until player_market_value
```

1	Muscle injury	2025-03-13	<NA>	1.8e+07
2	Muscle injury	2025-03-29	<NA>	1.2e+06
3	Knee problems	2025-03-14	<NA>	4.0e+06
4	Hamstring injury	2025-03-14	<NA>	2.2e+07
5	Hamstring injury	2025-02-25	<NA>	6.0e+07
6	Hamstring injury	2025-03-07	<NA>	4.0e+07

```
isl_injuries <- tm_league_injuries(country_name = "India")
isl_injuries |> head()
```

	comp_name	country		comp_url		player_name		player_url		position	current_club	age	nationality	second_nationality
1	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Madih Talal		https://www.transfermarkt.com/madih-talal/profil/spieler/518860		Attacking Midfield	East Bengal FC	27	France	Morocco
2	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Hijazi Maher		https://www.transfermarkt.com/hijazi-maher/profil/spieler/949858		Centre-Back	East Bengal FC	27	Jordan	<NA>
3	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Iker Guarrotxena		https://www.transfermarkt.com/iker-guarrotxena/profil/spieler/82471		Left Winger	FC Goa	32	Spain	<NA>
4	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Akash Mishra		https://www.transfermarkt.com/akash-mishra/profil/spieler/642347						
5	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Ayush Chhikara		https://www.transfermarkt.com/ayush-chhikara/profil/spieler/761693						
6	Indian Super League	India		https://www.transfermarkt.com/indian-super-league/startseite/wettbewerb/IND1		Roy Krishna		https://www.transfermarkt.com/roy-krishna/profil/spieler/64495						

4	Left-Back	Mumbai City FC	23	India	<NA>
5	Centre-Forward	Mumbai City FC	22	India	<NA>
6	Centre-Forward	Odisha FC	37	Fiji	New Zealand

		injury	injured_since	injured_until	player_market_value
1	Knee	injury	2024-12-13	<NA>	NA
2	Cruciate ligament	injury	2025-01-29	<NA>	NA
3	Knee	injury	2024-03-09	<NA>	NA
4	Cruciate ligament	injury	2024-04-25	<NA>	NA
5	Knee	injury	2024-03-09	<NA>	NA
6	Cruciate ligament	injury	2024-11-25	<NA>	NA

8 Team Transfer Data

```
man_utd_transfer_2020 <- tm_team_transfers(team_url = epl_2020[4], transfer_window = "all")
man_utd_transfer_2020 |> head()
```

	team_name	league	country	season	transfer_type
1	Manchester United	Premier League	England	2020	Arrivals
2	Manchester United	Premier League	England	2020	Arrivals
3	Manchester United	Premier League	England	2020	Arrivals
4	Manchester United	Premier League	England	2020	Arrivals
5	Manchester United	Premier League	England	2020	Arrivals
6	Manchester United	Premier League	England	2020	Arrivals

	player_name
1	Donny van de Beek
2	Alex Telles
3	Facundo Pellistri
4	Edinson Cavani
5	Dean Henderson
6	James Garner

	player_url
1	https://www.transfermarkt.com/donny-van-de-beek/profil/spieler/288255
2	https://www.transfermarkt.com/alex-telles/profil/spieler/255755
3	https://www.transfermarkt.com/facundo-pellistri/profil/spieler/676318
4	https://www.transfermarkt.com/edinson-cavani/profil/spieler/48280
5	https://www.transfermarkt.com/dean-henderson/profil/spieler/258919
6	https://www.transfermarkt.com/james-garner/profil/spieler/505219

	player_position	player_age	player_nationality	club_2
1	Central Midfield	23	Netherlands	Ajax
2	Left-Back	27	Brazil	FC Porto

3	Right Winger	18	Uruguay	Peñarol
4	Centre-Forward	33	Uruguay	Paris SG
5	Goalkeeper	23	England	Man Utd U21
6	Defensive Midfield	19	England	Man Utd U21

	league_2	country_2	transfer_fee	is_loan	transfer_notes	window
1	Eredivisie	Netherlands	39000000	FALSE	<NA>	Summer
2	Liga Portugal	Portugal	15000000	FALSE	<NA>	Summer
3	Liga AUF Clausura	Uruguay	8650000	FALSE	<NA>	Summer
4	Ligue 1	France	0	FALSE	<NA>	Summer
5	Premier League 2	England	NA	FALSE	-	Summer
6	Premier League 2	England	NA	FALSE	-	Summer

	in_squad	appearances	goals	minutes_played
1	54	36	1	1460
2	50	24	0	1761
3	2	0	0	0
4	39	39	17	2182
5	61	26	0	2325
6	NA	NA	NA	NA

```
nigeria_lg_2023 |> head()
```

```
[1] "https://www.transfermarkt.com/kano-pillars/startseite/verein/6799/saison_id/2023"
[2] "https://www.transfermarkt.com/enyimba-aba/startseite/verein/645/saison_id/2023"
[3] "https://www.transfermarkt.com/remo-stars-fc/startseite/verein/60222/saison_id/2023"
[4] "https://www.transfermarkt.com/lobi-stars-fc/startseite/verein/6907/saison_id/2023"
[5] "https://www.transfermarkt.com/shooting-stars-sc/startseite/verein/5739/saison_id/2023"
[6] "https://www.transfermarkt.com/rivers-united-fc/startseite/verein/53321/saison_id/2023"
```

```
npfl_matchday_38_table <- tm_matchday_table(country_name = "Nigeria", start_year = "2023", m
npfl_matchday_38_table |> head()
```

	country	league
1	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24
2	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24
3	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24
4	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24
5	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24
6	Nigeria Games of Matchday 38	Nigeria Professional Football League 23/24

	matchday	rk	squad	p	w	d	l	gf	ga	g_diff	pts
1	38	1	Enugu Rangers	38	21	7	10	56	33	23	70
2	38	2	Remo Stars FC	38	20	5	13	53	39	14	65

3	38	3	Enyimba Aba	38	19	6	13	46	33	13	63
4	38	4	Shooting Stars	38	18	8	12	48	34	14	62
5	38	5	Plateau United	38	18	4	16	53	40	13	58
6	38	6	Lobi Stars	38	17	7	14	48	45	3	58

```
enugu_rangers_2023 <- tm_squad_stats(team_url = nigeria_lg_2023[13])
```

Warning in data.frame(team_name = as.character(team_name), league = as.character(league), : NAs introduced by coercion

```
enugu_rangers_2023 |> head()
```

	team_name	league	country	player_name	player_url	player_pos
1	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Detan Ogundare		
2	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Chizoba Okoh		
3	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Nana Bonsu		
4	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Emeka Nwabulu		
5	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Japhet Opubo		
6	Enugu Rangers IFC	Nigeria Professional Football League	Nigeria	Kingdom Osayi		
1					https://www.transfermarkt.com/detan-ogundare/profil/spieler/647953	Goalkeeper
2					https://www.transfermarkt.com/chizoba-okoh/profil/spieler/1108150	Goalkeeper
3					https://www.transfermarkt.com/nana-bonsu/profil/spieler/282025	Goalkeeper
4					https://www.transfermarkt.com/emeka-nwabulu/profil/spieler/869561	Goalkeeper
5					https://www.transfermarkt.com/japhet-opubo/profil/spieler/677862	Goalkeeper
6					https://www.transfermarkt.com/kingdom-osayi/profil/spieler/720747	Goalkeeper
	player_age	nationality	in_squad	appearances	goals	minutes_played
1	22	Nigeria	24	9	0	810
2	20	Nigeria	4	0	0	0
3	34	Ghana	0	0	0	0
4	26	Nigeria	0	0	0	0
5	28	Nigeria	34	29	0	2610
6	NA	Nigeria	0	0	0	0

8.1 Statistical Analysis

8.1.1 Top Scorer


```
top_scorer <- enugu_rangers_2023 |>
  filter(goals == max(goals)) |>
  pull(player_name)
top_scorer
```

```
[1] "Godwin Obaje"
```

```
most_played <- enugu_rangers_2023 |>
  filter(minutes_played == max(minutes_played)) |>
  select(player_name, player_pos, player_age)
most_played
```

```
      player_name player_pos player_age
1 Ifeanyi Onyebuchi Centre-Back      23
```

9 ISL data analysis

```
# R codes
isl_long <- read_excel("./data/isl_long.xlsx")

# Data Preparation
dat <- isl_long[, c(1, 3:6)] |>
  distinct() |>
  select(-date)

# Create the result dataset
results <- dat |>
  filter(away_team != 'M') |>
  mutate(
    winner = ifelse(home_team_score > away_team_score, home_team,
                    ifelse(away_team_score > home_team_score, away_team, "Draw")),
    opponent = ifelse(winner == home_team, away_team,
                      ifelse(winner == away_team, home_team, NA))) |>
  filter(winner != "Draw") |>
  select(winner, opponent) |>
  mutate(winner_fac = factor(winner, levels = unique(c(winner, opponent))),
         opponent_fac = factor(opponent, levels = unique(c(winner, opponent))))
```

```

# Build Bradley-Terry Model
model <- BTm(outcome = rep(1, nrow(results)), winner_fac, opponent_fac, data = results)

model2 <- update(model, refcat = "Mohun Bagan Super Giant")

# Summarize the model
summary(model)
summary(model2)

strengths <- model2$coefficients |>
  as.data.frame() |>
  rownames_to_column(var = "Team") |>
  add_row(Team = "..Mohun Bagan Super Giant", `model2$coefficients` = 0) |>
  mutate(Strength = round(exp(`model2$coefficients`), 3),
         Team = str_remove_all(Team, "\\..")) |>
  select(Team, Strength) |>
  arrange(desc(Strength))

# Define the color
col1 <- c("#005830", "#6babdc", "#29479f", "#f47b2c", "#bf3428",
          "#a6234f", "#f8ec4a", "#2b2a71", "#8769cc", "#1c4792",
          "#fddb00", "#623d94", "#db4a27", "#e12529", "#f32735")

col2 <- c("#a82d32", "#ffffff", "#ed212a", "#1c2453", "#2b3558",
          "#394a7f", "#013ca6", "#e30613", "#1e2a5c", "#fcb813",
          "#231f20", "#f6991f", "#ae2f24", "#313846", "#ff9e18")

logos <- c("mbsg", "mcfc", "bfc", "fcg", "atk", "jfc",
          "kbfc", "ddfc", "ofc", "cfc", "hfc", "pcfc",
          "pfc", "neufc", "ebfc")

team_logos <- paste0("<img src='./logos/', logos, '.png' width='30' height='30' />")

strengths <- strengths |>
  dplyr::mutate(gradient_start = col1,
               gradient_end = col2,
               orient = 'horizontal',
               logos = team_logos)

```

```

isl_plot <- ggplot(strengths, aes(x = reorder(Team, Strength), y = Strength, fill = Team)) +
  geom_bar_pattern(
    aes(pattern_fill = I(gradient_start),
        pattern_fill2 = I(gradient_end),
        pattern_orientation = I(orient)),
    stat = 'identity',
    pattern = "gradient",
    color = 'black') +
  coord_flip() +
  scale_x_discrete(name = NULL, labels = rev(strengths$logos)) +
  theme(legend.position = "none",
        text = element_text(family = "poppins"),
        # axis.text.y = element_text(size = 16, face = "bold"),
        axis.title.y = element_text(size = 18),
        axis.title.x = element_text(size = 18),
        plot.title = element_text(size = 25, hjust = 0.5, face = "bold"),
        plot.subtitle = element_text(size = 20, hjust = 0.5, face = "bold"),
        plot.caption = element_text(size = 15),
        # axis.text.x = element_text(size = 20),
        axis.text.y = element_markdown(),
        # plot.background = element_rect(fill = "#fdd3d3", color = NA),
        # panel.background = element_rect(fill = "#c7faaf", color = NA),
        panel.grid.minor = element_line(colour = "gray40")) +
  geom_text(aes(label = round(Strength, 2)), hjust = -0.1, size = 6.5) +
  geom_hline(yintercept = 0, color = "black", linewidth = 1) +
  labs(title = "ISL Teams' Strength Rankings Based on Bradley-Terry Model",
        subtitle = "Analyzing Team Performance through Statistical Ranking",
        x = "ISL Teams",
        y = "Strength",
        caption = "Data collected till ISL Season 2023-24")

```