

HPL BOT MANUAL

1. Reading the data from a google sheet

- <https://www.twilio.com/blog/2017/02/an-easy-way-to-read-and-write-to-a-google-spreadsheet-in-python.html> shows how to get the “Path to client_secret.json” (line 8), as well as how to integrate your Google sheet into Python.

	A	B	C	D	E	F
1						
2		Man City		Liverpool		Tott
3	GK	Ederson	90	Alisson	90	Buffon
4	RB	Casemiro	89	TAA	90	Kimmich
5	LB	Laporte	91	Robertson	90	Max Aarons
6	CB	Stones	90	Van Dijk	94	D. Sanchez
7	CB	Petit	95	Holding	89	Skriniar
8	DM	Sterling	92	Frenkie De Jong	92	Torreira
9	DM	De Bruyne	91	Dalot	87	Fabinho
10	AM	Bernardo Silva	91	Salah	91	Deco
11	LW	Solskjaer	97	Nicolas Pepe	87	Son
12	RW	Memphis	89	F. Puskas	97	Coutinho
13	ST	Piatek	92	Drogba	98	Kane
14	SUB	Florentino	87	Fekir	87	Ferro
15	SUB	Bailly	88	Richarlison	87	Ben Davies (LB
16	SUB	Tsygankov	89	Mane	91	Patrick Roberts
17	No. of defenders	3		4		
18	PK taker	13		11		
19	FK taker	9		4		
20	Tactics	5		3		
21		Jorge Camacho	70	Neto	84	Tim Krul
22		Jed Steer	63	Kozlov	71	K. Schmeichel
23		Yasser Larouci	75	Rafinho	70	Godfrey
24		Chris Jones	73	Van Den Berg	73	Hoever
25		Zinchenko	86	Andre Gomes	83	Sessegnon
26		Lenglet	85	Pasalic	74	Nkunku
27		Tyler Adams	81	Claudio Gomes	79	Xhaka
28		Van Jansen	85	James Garner	77	Wesley
29		Brooks	82	Riqui Puig	72	Muto
30		Tom Davies	79	Lewis Baker	81	

This is how the sheet should look. “Workbook name” is “Hypothetical PL 2” and “Squad sheet name” is “Rosters (line 10). Notice the gaps and the format very closely, if you don’t follow it you’ll either get an error or get an issue with the teams, and you won’t want that! The colors and borders are not necessary. Every player name must be unique, team names must be unique as well.

- Formations are to be entered in a particular order to allow the scorer and assister algorithm to work most properly. It will work even if you don’t follow the order, but you could end up seeing center backs and defensive midfielders top the score charts. Starred (*) players are meant to be the most attacking player in that position (creative midfielders, out and out strikers). The order of wide players is clockwise (RB...LB...LW...RW) but can be changed anyhow.

- 4-2-3-1: GK, RB, LB, CB, CB, DM, DM, AM, LW, RW, ST
- 4-4-2: GK, RB, LB, CB, CB, CM, CM, LM, RM, ST, ST*

- 4-3-3: GK, RB, LB, CB, CB, CM, CM, CM*, LW, RW, ST
- 4-4-2 D or 4-3-1-2: GK, RB, LB, CB, CB, CM, CM, CM*, AM, ST, ST*
- 3-4-3: GK, CB, CB, CB, RM, LM, CM, CM, LW, RW, ST
- 3-5-2: GK, CB, CB, CB, RM, LM, DM, CM, CM*, ST, ST*
- 3-4-1-2: GK, CB, CB, CB, RM, LM, CM, CM, AM, ST, ST*
- 5-2-3: GK, RWB, LWB, CB, CB, CB, CM, CM, LW, RW, ST
- 5-3-2: GK, RWB, LWB, CB, CB, CB, CM, CM, CM*, ST, ST*
- 5-2-1-2: GK, RWB, LWB, CB, CB, CB, CM, CM, AM, ST, ST*

3. Tactics 1 to 6 work by a zero-sum principle (i.e. the number of strengths is equal to the number of weaknesses). Think rock-paper-scissors. Tactics 7 and 8 are special tactics. Tactic 1 would ideally be the default, most common, or most simple tactic.

- Tactics 1 to 6 have two strengths and two weaknesses each, in this format:
 - Rock: 1 and 4
 - Paper: 2 and 5
 - Scissors: 3 and 6
- Since rock is strong against scissors, there are going to be two tactics which always lose to the default or basic one. To avoid this, and to encourage dynamic participation, ask each player to give their favored tactics when they join the league. This will ensure there are less people with defaults.
- If a team plays tactic 7 or 8, all other tactics are nullified.
- Tactic 7 is bus parking which could lead to lower goals scored and conceded.
- Tactic 8 is all out attack which could lead to higher goals scored and conceded.
- The chance of scoring or conceding depends on team ratings. For example,
 - Team A is rated 30 and Team B is rated 90. Either (or both) teams park the bus. The probabilities are based on the ratio of the ratings.

	Concede Less	Score Less
Team A	25%	75%
Team B	75%	25%

- Team A is rated 30 and Team B is rated 90. Either (or both) teams chose all out attack. The probabilities are based on the ratio of the ratings.

	Concede More	Score More
Team A	75%	25%
Team B	25%	75%

4. Scorers and assisters are determined by a three step process: finding the chances of each player scoring or assisting, choosing a random number, and involving different kinds of goals. The number of goals depends on the scoreline found by the `get_scoreline()` function.

- Chances of scoring are different for different players, and are based on positions and ratings. Probability “bins” are created by adding these numbers to the sum of remaining numbers. For example, for the numbers 80, 30, and 50, the bins will be 80, 110, and 160.
 - A random number is chosen between 0 and the predecessor of the maximum number (here, 159). The index of the first bin which exceeds the number is the goal scorer. So, if the number is 134, the goal scorer is Player #3. If the number is 15, the goal scorer is Player #1. Note that Player #0 is the goalkeeper who never scores, regardless of his rating.
 - More random numbers are taken for different types of goals. A random number between 0 and 19 is drawn. If this number is 0 or 1, the goal scored is a penalty. If it is 2, the goal is a free kick. If it is 3, the goal is an own goal.
 - The limit is Player #13. Penalties count as Player #14, free kicks count as Player #15. Own goals range from Player #16 to Player #21, where #16 is the opponent's #0 and #21 is the opponent's #5.
 - Assists are drawn the same way, using probability bins and random numbers, however there are no special assists. An unassisted goal happens when the goal scorer and the assister are the same.
 - Minutes are chosen as random numbers from 1 to 97:
 - 1 to 45: Minutes 1 to 45
 - 46 to 48: Minutes 45+1 to 45+3
 - 49 to 93: Minutes 46 to 90
 - 94 to 97: Minutes 90+1 to 90+4
5. Fixtures are generally created as a double round-robin, where each team plays each other team, home and away. By removing line 532, you get only one set of matches. See 8. for how to remove home advantage
6. When points are same, there are two criteria that come into play. For the Premier League and for this sim, the first tie-breaker is goal difference, and the second is goals scored. In lines 629 to 633, you'll want to replace all instances of 8 with your first tiebreaker, and all instances of 6 with your second tiebreaker. If you want one tiebreaker, delete lines 632-634. If you don't want tiebreakers, delete lines 629-634. Tiebreaker numbers are as follows:
- Wins: 2
 - Draws: 3
 - Losses: 4
 - Goals for: 6
 - Goals against: 7
 - Goal difference: 8
7. Remove the [:5] or [:15] if you want to see all goal scorers, assisters, or player ratings.

8. In line 694, change `play_week` to `play_cup_round` if you want knockouts or finals, and `play_league` if you want an entire league. Also, remove line 78 if you want to play at a neutral venue.