

# OBJECT ORIENTED PROGRAMMING

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# COLLEGE BASKETBALL

- Columns: 34
- Rows: 53949
- Goal: Create a player class, complete with initialization function. Use the data in your file to create player objects for each sample in your data.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI
League	Season	Stage	Player	Team	GP	MIN	FGM	FGA	3PM	3PA	FTM	FTA	TOV	PF	ORB	DRB	REB	AST	STL	BLK	PTS	birth_year	birth_mon	birth_date	height	height_cm	weight	weight_kg	nationality	high_scho	draft_roun	draft_pick	draft_team	
NBA	1999 - 200	Regular_S	Shaquille L	LAL	79	3163	956	1665	0	1	432	824	223	255	336	742	1078	299	36	239	2344	1972	Mar	6-Mar-72	1-Jul	216	325	147	United Sta Robert G.	1	1	Orlando Magic		
NBA	1999 - 200	Regular_S	Vince Carl TOR		82	3126	788	1696	95	236	436	551	178	263	150	326	476	322	110	92	2107	1977	Jan	#####	6-Jun	198	220	100	United Sta Mainland I	1	5	Golden State Warri		
NBA	1999 - 200	Regular_S	Karl Malor UTA		82	2947	752	1476	2	8	589	739	231	229	169	610	779	304	79	71	2095	1963	Jul	24-Jul-63	9-Jun	206	265	120	United Sta Summerfie	1	13	Utah Jazz		
NBA	1999 - 200	Regular_S	Allen Ivers PHI		70	2853	729	1733	89	261	442	620	230	162	71	196	267	328	144	5	1989	1975	Jun	7-Jun-75	Jun-00	183	165	75	United Sta Bethel Hig	1	1	Philadelphia Sixers		
NBA	1999 - 200	Regular_S	Gary Paytc SEA		82	3425	747	1666	177	520	311	423	224	178	100	429	529	732	153	18	1982	1968	Jul	23-Jul-68	4-Jun	193	180	82	United Sta Skyline Hij	1	2	Seattle SuperSonics		
NBA	1999 - 200	Regular_S	Jerry Stacl DET		82	3148	619	1447	83	288	618	758	311	188	118	197	315	365	103	36	1939	1974	Nov	5-Nov-74	6-Jun	198	218	99	United Sta Oak Hill Ac	1	3	Philadelphia Sixers		
NBA	1999 - 200	Regular_S	Grant Hill DET		74	2776	696	1422	34	98	480	604	240	190	97	393	490	385	103	43	1906	1972	Oct	5-Oct-72	8-Jun	203	225	102	United Sta South Lake	1	3	Detroit Pistons		
NBA	1999 - 200	Regular_S	Kevin Garr MIN		81	3243	759	1526	30	81	309	404	268	205	223	733	956	401	120	126	1857	1976	May	#####	11-Jun	211	240	109	United Sta Farragut C	1	5	Minnesota Timberwol		
NBA	1999 - 200	Regular_S	Michael Fi DAL		82	3464	748	1636	99	247	260	317	196	171	122	396	518	438	109	32	1855	1973	Mar	6-Mar-73	7-Jun	201	225	102	United Sta Proviso Ea	1	21	Phoenix Suns		
NBA	1999 - 200	Regular_S	Chris Web SAC		75	2880	748	1548	27	95	311	414	218	264	189	598	787	345	120	128	1834	1973	Mar	1-Mar-73	9-Jun	206	245	111	United Sta Detroit Co	1	1	Orlando Magic		
NBA	1999 - 200	Regular_S	Ray Allen MIL		82	3070	642	1411	172	407	353	398	183	187	83	276	359	308	110	19	1809	1975	Jul	20-Jul-75	5-Jun	196	205	93	United Sta Hillcrest H	1	5	Minnesota Timberwol		
NBA	1999 - 200	Regular_S	Alonzo Mo MIA		79	2748	652	1184	0	4	414	582	217	308	215	538	753	123	40	294	1718	1970	Feb	8-Feb-70	10-Jun	208	240	109	United Sta Indian Riv	1	2	Charlotte Hornets		
NBA	1999 - 200	Regular_S	Tim Dunc SAS		74	2875	628	1281	1	11	459	603	242	210	262	656	918	234	66	165	1716	1976	Apr	#####	11-Jun	211	250	113	United Sta St. Dunsta	1	1	San Antonio Spurs		
NBA	1999 - 200	Regular_S	Glenn Rob MIL		81	2909	690	1461	86	237	227	283	223	212	107	378	485	193	78	41	1693	1973	Jan	#####	7-Jun	201	225	102	United Sta Theodore I	1	1	Milwaukee Bucks		
NBA	1999 - 200	Regular_S	Antoine W BOS		82	3003	648	1506	73	285	311	445	259	263	199	453	652	305	117	32	1680	1976	Aug	#####	9-Jun	206	265	120	United Sta Mount Cai	1	6	Boston Celtics		
NBA	1999 - 200	Regular_S	Shareef At VAN		82	3223	594	1277	29	96	446	551	249	244	218	607	825	271	89	87	1663	1976	Dec	#####	9-Jun	206	225	102	United Sta Joseph Wh	1	3	Vancouver Grizzlies		
NBA	1999 - 200	Regular_S	Stephon M NJN		74	2881	569	1317	66	233	436	536	270	195	61	179	240	622	112	15	1640	1977	Feb	#####	2-Jun	188	180	82	United Sta Abraham L	1	4	Milwaukee Bucks		
NBA	1999 - 200	Regular_S	Elton Bran CHI		81	2999	630	1306	0	2	367	536	228	259	348	462	810	155	66	132	1627	1979	Mar	#####	9-Jun	206	254	115	United Sta Peekskill H	1	1	Chicago Bulls		
NBA	1999 - 200	Regular_S	Allan Hou NYK		82	3169	614	1271	106	243	280	334	186	219	38	233	271	224	65	14	1614	1971	Apr	#####	6-Jun	198	205	93	United Sta Ballard Hi	1	11	Detroit Pistons		
NBA	1999 - 200	Regular_S	Antonio M DEN		81	2698	614	1211	0	2	323	516	230	316	234	451	685	159	69	139	1551	1974	Sep	7-Sep-74	9-Jun	206	245	111	United Sta Quitman H	1	2	Los Angeles Clippers		
NBA	1999 - 200	Regular_S	Keith Van I NJN		80	2782	559	1257	84	228	333	393	245	258	200	476	676	158	64	60	1535	1975	Oct	#####	10-Jun	208	220	100	United Sta Diamond f	1	2	Philadelphia Sixers		
NBA	1999 - 200	Regular_S	Latrell Spr NYK		82	3276	568	1305	44	127	344	397	226	184	49	300	349	332	109	22	1524	1970	Sep	8-Sep-70	5-Jun	196	190	86	United Sta Washingtc	1	24	Golden State Warri		
NBA	1999 - 200	Regular_S	Sam Cassi MIL		81	2899	545	1170	26	90	390	445	267	255	69	232	301	729	102	8	1506	1969	Nov	#####	3-Jun	191	185	84	United Sta Dunbar Hi	1	24	Houston Rockets		
NBA	1999 - 200	Regular_S	Michael D VAN		82	3103	554	1270	119	291	269	324	165	226	78	201	279	208	116	45	1496	1975	Jun	#####	5-Jun	196	190	86	United Sta Federal W	1	14	Houston Rockets		
NBA	1999 - 200	Regular_S	Kobe Brya LAL		66	2524	554	1183	46	144	331	403	182	220	108	308	416	323	106	62	1485	1978	Aug	#####	6-Jun	198	212	96	United Sta Lower Mer	1	13	Charlotte Hornets		
NBA	1999 - 200	Regular_S	Cliff Robin PHX		80	2839	530	1142	120	324	298	381	166	239	105	254	359	224	90	61	1478	1966	Dec	#####	10-Jun	208	225	102	United Sta Riverside I	2	9	Portland Trail Blazers		
NBA	1999 - 200	Regular_S	Reggie Mil IND		81	2987	466	1041	165	404	373	406	129	126	50	189	239	187	85	25	1470	1965	Aug	#####	7-Jun	201	185	84	United Sta Riverside I	1	11	Indiana Pacers		
NBA	1999 - 200	Regular_S	Shawn Ker CLE		82	2487	484	1160	2	6	493	635	291	371	231	494	725	138	100	96	1463	1969	Nov	#####	10-Jun	208	280	127	United Sta Concord H	1	17	Seattle SuperSonics		
NBA	1999 - 200	Regular_S	Jalen Rose IND		80	2978	563	1196	77	196	254	307	188	234	42	345	387	320	84	49	1457	1973	Jan	#####	8-Jun	203	210	95	United Sta Southwest	1	13	Denver Nuggets		
NBA	1999 - 200	Regular_S	Eddie Jon CHA		72	2807	478	1119	128	341	362	419	160	176	81	262	343	305	192	49	1446	1971	Oct	#####	6-Jun	198	200	91	United Sta Blanche E	1	10	Los Angeles Lakers		
NBA	1999 - 200	Regular_S	Dirk Nowit DAL		82	2938	515	1118	116	306	289	348	141	256	102	430	532	203	63	68	1435	1978	Jun	#####	Jul-00	213	245	111	Germany	1	9	Milwaukee Bucks		
NBA	1999 - 200	Regular_S	David Rob SAS		80	2557	528	1031	0	2	371	511	164	247	193	577	770	142	97	183	1427	1965	Aug	6-Aug-65	1-Jul	216	250	113	United Sta Osbourn P	1	1	San Antonio Spurs		
NBA	1999 - 200	Regular_S	Paul Pierc BOS		73	2583	486	1099	96	280	359	450	178	237	83	313	396	221	152	62	1427	1977	Oct	#####	7-Jun	201	235	107	United Sta Inglewood	1	10	Boston Celtics		
NBA	1999 - 200	Regular_S	Steve Frar HOU		77	2776	497	1117	107	310	287	365	306	231	152	257	409	507	118	29	1388	1977	Feb	#####	3-Jun	191	195	88	United Sta Montgome	1	2	Vancouver Grizzlies		
NBA	1999 - 200	Regular_S	Darrell Arz ORL		82	2500	484	1110	127	402	225	247	248	127	65	205	270	501	169	9	1220	1968	Jun	#####	Jun-00	182	170	77	United Sta Ashbrook High School					

```
1 class Player:
2     def __init__(self, **fields):
3         # store all fields as attributes
4         for k, v in fields.items():
5             setattr(self, k, v)
6
7     def __repr__(self):
8         # show a compact but informative representation
9         name = getattr(self, 'Player', getattr(self, 'player', None))
10        team = getattr(self, 'Team', None)
11        pts = getattr(self, 'PTS', None)
12        return f"Player(name={name!r}, team={team!r}, PTS={pts!r})"
13
14
15 def split_csv_line(line):
16     """Split a CSV line into fields, handling quoted fields with commas.
17     This is a minimal parser suitable for well-formed CSV with double qu
18     """
19     fields = []
20     cur = []
21     in_quotes = False
22     i = 0
23     while i < len(line):
24         ch = line[i]
25         if ch == '"':
26             # toggle in_quotes unless this is an escaped quote
27             if in_quotes and i + 1 < len(line) and line[i + 1] == '"':
28                 cur.append('"')
29                 i += 1
30             else:
31                 in_quotes = not in_quotes
32         elif ch == ',' and not in_quotes:
33             fields.append(''.join(cur))
34             cur = []
35         else:
36             cur.append(ch)
```

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# CODE

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37         i += 1
38     # append last field (strip trailing newline)
39     if cur:
40         fields.append(''.join(cur).rstrip('\n').rstrip('\r'))
41     return fields
42
43
44 def convert_value(val):
45     """Attempt to convert to int or float, or return stripped string.
46     if val is None:
47         return None
48     s = val.strip()
49     if s == '':
50         return None
51     # try int
52     try:
53         if '.' not in s:
54             return int(s)
55     except Exception:
56         pass
57     # try float
58     try:
59         return float(s)
60     except Exception:
61         pass
62     # remove surrounding quotes if any
63     if len(s) >= 2 and s[0] == '"' and s[-1] == '"':
64         s = s[1:-1]
65     return s
66
67
68 def read_players(csv_path):
69     players = []
70     with open(csv_path, 'r', encoding='utf-8') as f:
71         header_line = f.readline()

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# CODE

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72     if not header_line:
73         return players
74     headers = [h.strip() for h in split_csv_line(header_line)]
75     for line in f:
76         # skip empty lines
77         if not line.strip():
78             continue
79         cols = split_csv_line(line)
80         # if number of columns mismatches header, keep as-is and pad
81         if len(cols) < len(headers):
82             cols += [None] * (len(headers) - len(cols))
83         elif len(cols) > len(headers):
84             # join extra columns into the last header (rare) or truncate
85             cols = cols[:len(headers)]
86         row = {}
87         for h, v in zip(headers, cols):
88             row[h] = convert_value(v)
89         players.append(Player(**row))
90     return players

```

```

91
92
93 if __name__ == '__main__':
94     csv_file = 'basketball.csv'
95     print(f"Reading '{csv_file}' and creating Player objects (no pandas)")
96     players = read_players(csv_file)
97     print(f"Total players created: {len(players)}")
98     # print first 10 players as verification
99     to_show = min(10, len(players))
100    print(f"Showing first {to_show} players:")
101    for p in players[:to_show]:
102        print(p)

```

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103
104 # optional: demonstrate access to fields of first player
105 if players:
106     first = players[0]

```

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print('\nExample of full attribute set for first player:')
attrs = sorted([a for a in dir(first) if not a.startswith('_') and not callable(getattr(first, a))])
# print name: value pairs
for a in attrs:
    print(f"{a}: {getattr(first, a)}")

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# CODE

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# OOP CONCEPTS IN THIS CODE

OOP Concept	Where It Appears	Description
<b>Class</b>	<code>class Player:</code>	Blueprint for creating player objects
<b>Object / Instance</b>	<code>Player(**row)</code>	Individual players created from the class
<b>Attributes</b>	<code>setattr(self, k, v)</code>	Store data (name, team, points) in each object
<b>Encapsulation</b>	<code>__init__, __repr__</code>	Class hides details and provides a clear interface
<b>Dynamic Initialization</b>	<code>**fields</code>	Class adapts to different datasets flexibly
<b>String Representation</b>	<code>__repr__</code>	Defines readable output for objects

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# RESULT

```
Total players created: 53949
Showing first 10 players:
Player(name="Shaquille O'Neal", team='LAL', PTS=2344)
Player(name='Vince Carter', team='TOR', PTS=2107)
Player(name='Karl Malone', team='UTA', PTS=2095)
Player(name='Allen Iverson', team='PHI', PTS=1989)
Player(name='Gary Payton', team='SEA', PTS=1982)
Player(name='Jerry Stackhouse', team='DET', PTS=1939)
Player(name='Grant Hill', team='DET', PTS=1906)
Player(name='Kevin Garnett', team='MIN', PTS=1857)
Player(name='Michael Finley', team='DAL', PTS=1855)
Player(name='Chris Webber', team='SAC', PTS=1834)
```

```
Example of full attribute set for first player:
3PA: 1
3PM: 0
AST: 299
BLK: 239
DRB: 742
FGA: 1665
FGM: 956
FTA: 824
FTM: 432
GP: 79
League: NBA
MIN: 3163.0
ORB: 336
PF: 255
PTS: 2344
Player: Shaquille O'Neal
REB: 1078
STL: 36
Season: 1999 - 2000
Stage: Regular_Season
TOV: 223
Team: LAL
birth_date: Mar 6, 1972
birth_month: Mar
birth_year: 1972
draft_pick: 1
draft_round: 1
draft_team: Orlando Magic
height: 7-1
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
Team: LAL
birth_date: Mar 6, 1972
birth_month: Mar
birth_year: 1972
draft_pick: 1
```

```
draft_round: 1
draft_team: Orlando Magic
height: 7-1
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
birth_date: Mar 6, 1972
birth_month: Mar
birth_year: 1972
draft_pick: 1
draft_round: 1
draft_team: Orlando Magic
height: 7-1
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
draft_pick: 1
draft_round: 1
draft_team: Orlando Magic
height: 7-1
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
height_cm: 216
high_school: Robert G. Cole High School
nationality: United States
weight: 325
weight_kg: 147
```