```python
In [ ]: import pandas as pd
```

```python
In [ ]: df = pd.read_csv('full.csv')

        from utils import data_munging, add_cumulative_stats
        df_full, df_full_nums = data_munging()
```

```
/Users/joshualambert/Desktop/repos/DadBodBombers/utils.py:106: FutureWarnin
g: Downcasting behavior in `replace` is deprecated and will be removed in a
future version. To retain the old behavior, explicitly call `result.infer_ob
jects(copy=False)`. To opt-in to the future behavior, set `pd.set_option('fu
ture.no_silent_downcasting', True)`
  recent_game.replace('', 0, inplace=True)
```

```python
In [ ]: df_agg = df_full.groupby(['id', 'name'])[['atbats', 'run', 'rbi', 'walks', '
        df = add_cumulative_stats(df_agg)
```

```python
In [ ]: df
```

Out[ ]:

	id	name	atbats	run	rbi	walks	single	double	triple	homerun	games_p
0	1	Josh	54	35.0	26.0	4	15	5	9	6	
1	3	Cody	53	25.0	16.0	5	18	5	3	1	
2	4	Ben	55	23.0	20.0	4	24	5	1	3	
3	5	Grace	59	35.0	21.0	10	26	6	3	2	
4	6	Tyler	39	20.0	14.0	3	14	5	4	2	
5	7	Sean	53	6.0	7.0	3	14	2	0	0	
6	8	Sweet	35	16.0	11.0	3	22	1	0	0	
7	9	Niko	32	11.0	17.0	0	9	0	2	3	
8	10	Renzo	22	4.0	2.0	0	10	1	0	0	
9	11	Frank	30	6.0	5.0	1	12	0	0	0	
10	12	Shack	50	9.0	6.0	12	6	3	0	0	
11	13	JR	6	1.0	0.0	0	3	0	0	0	
12	14	Connor	2	0.0	0.0	0	1	0	0	0	
13	15	James	5	3.0	1.0	1	2	0	0	0	
14	16	Dan	17	6.0	8.0	2	2	2	1	2	
15	17	Spangler	30	7.0	9.0	3	5	7	1	1	
16	18	Beep	43	15.0	23.0	5	24	3	1	0	
17	19	Forrest	25	10.0	7.0	3	8	0	0	2	
18	20	Lyndon	2	0.0	0.0	0	0	0	0	0	
19	21	Todd	15	4.0	3.0	0	2	2	0	0	
20	22	Blake	16	4.0	5.0	0	6	4	1	0	
21	23	Aroy	4	1.0	0.0	0	0	0	0	1	
22	24	Taylor	2	0.0	0.0	0	1	0	0	0	
23	25	Brett	3	0.0	0.0	0	0	0	0	0	

In [ ]:
```python
test = df_full.groupby('game')[['games_played', 'run', 'single', 'double', '
test['Number of Players'] = test['games_played']
test['Runs'] = test['run']
correlation = test.loc[test['games_played']>11][['Number of Players', 'Runs'
```
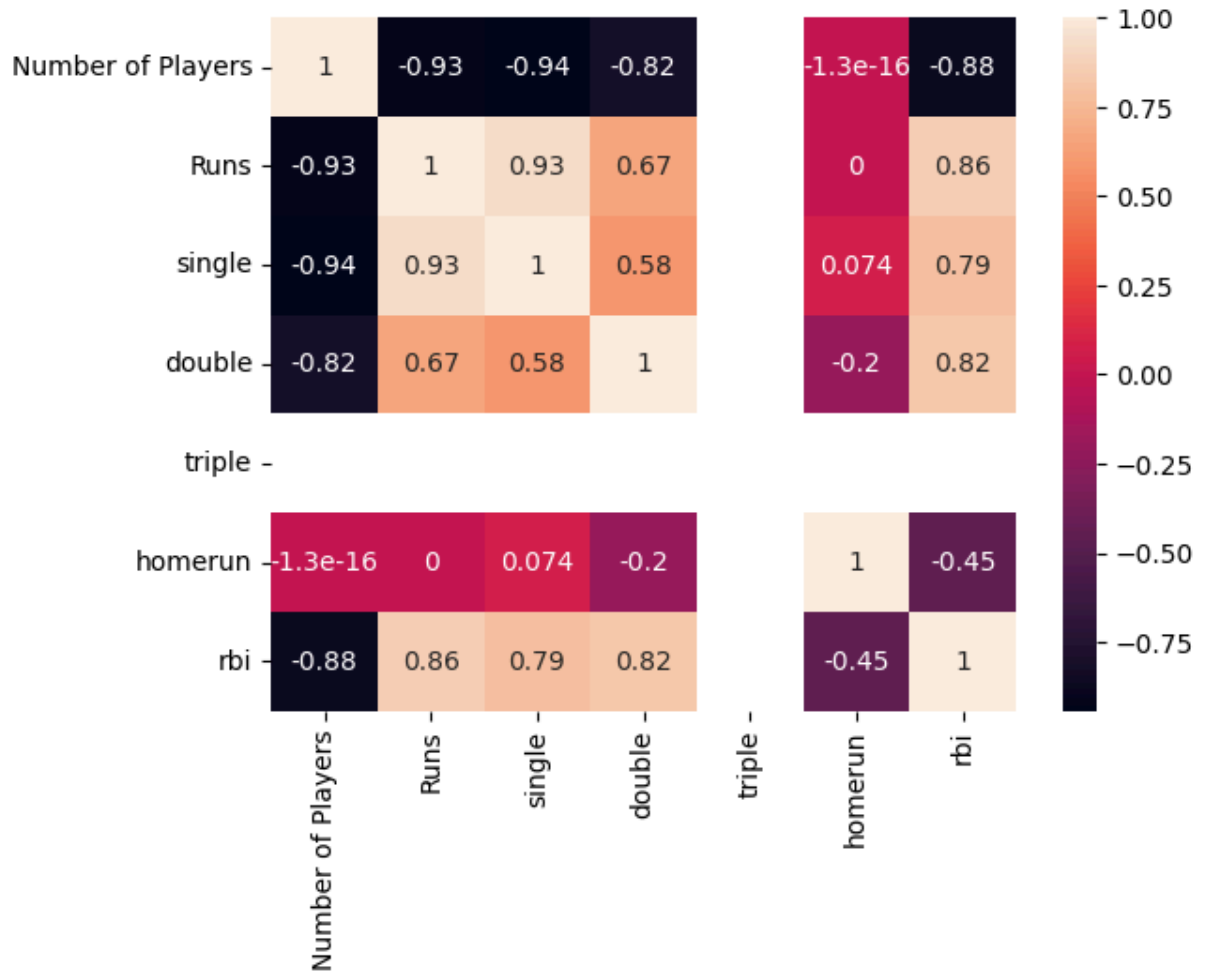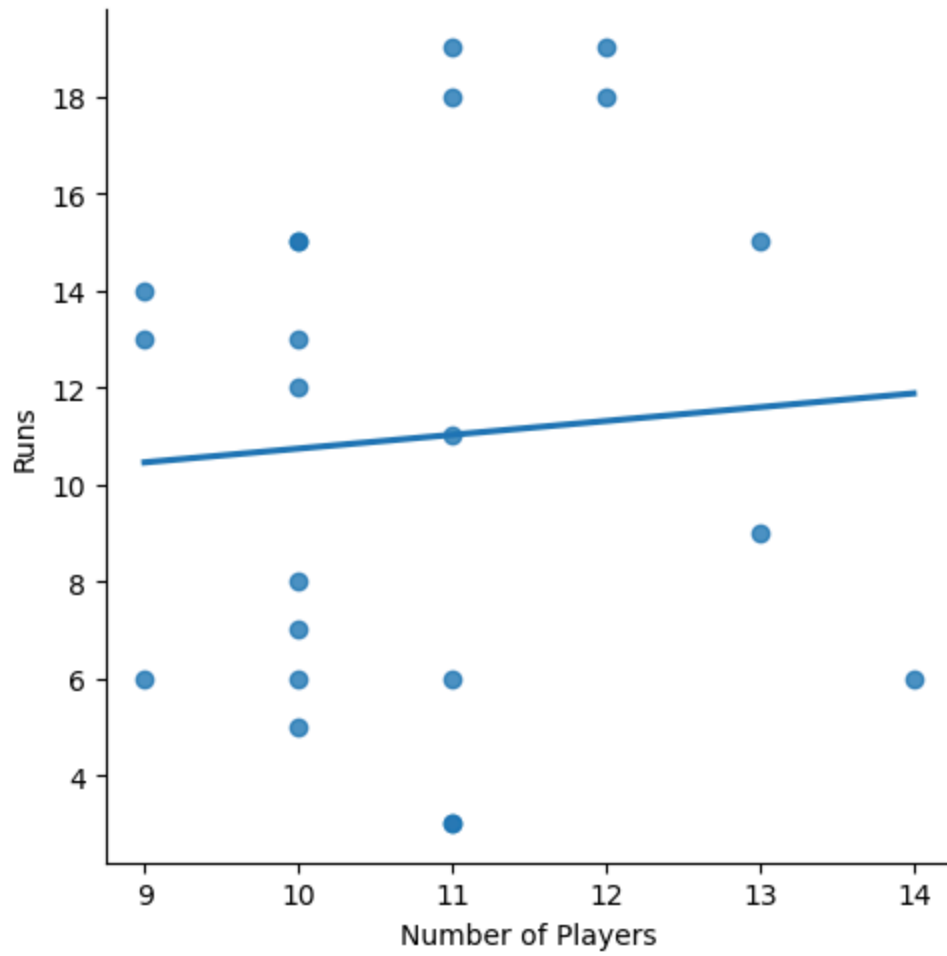
In [ ]:
```python
correlation
```

Out[ ]:

	Number of Players	Runs	single	double	triple	homerun	
Number of Players	1.000000e+00	-0.925342	-0.942232	-0.820413	NaN	-1.326970e-16	-0.88
Runs	-9.253423e-01	1.000000	0.931707	0.672894	NaN	0.000000e+00	0.864
single	-9.422315e-01	0.931707	1.000000	0.583410	NaN	7.437051e-02	0.794
double	-8.204127e-01	0.672894	0.583410	1.000000	NaN	-1.961161e-01	0.82
triple	NaN	NaN	NaN	NaN	NaN	NaN	
homerun	-1.326970e-16	0.000000	0.074371	-0.196116	NaN	1.000000e+00	-0.44
rbi	-8.809524e-01	0.864003	0.794082	0.820413	NaN	-4.482107e-01	1.00

In [ ]:
```python
import seaborn as sns

corrplot = sns.heatmap(correlation, annot=True)
```

```
In [ ]:  linplot = sns.lmplot(x='Number of Players', y='Runs', data=test, scatter=Tru
```

```
In [ ]: df_agg
```

Out[ ]:

	id	name	atbats	run	rbi	walks	single	double	triple	homerun	games_
0	1	Josh	54	35.0	26.0	4	15	5	9	6	
1	2	Clos	20	3.0	4.0	1	3	1	1	1	
2	3	Cody	53	25.0	16.0	5	18	5	3	1	
3	4	Ben	55	23.0	20.0	4	24	5	1	3	
4	5	Grace	59	35.0	21.0	10	26	6	3	2	
5	6	Tyler	39	20.0	14.0	3	14	5	4	2	
6	7	Sean	53	6.0	7.0	3	14	2	0	0	
7	8	Sweet	35	16.0	11.0	3	22	1	0	0	
8	9	Niko	32	11.0	17.0	0	9	0	2	3	
9	10	Renzo	22	4.0	2.0	0	10	1	0	0	
10	11	Frank	30	6.0	5.0	1	12	0	0	0	
11	12	Shack	50	9.0	6.0	12	6	3	0	0	
12	13	JR	6	1.0	0.0	0	3	0	0	0	
13	14	Connor	2	0.0	0.0	0	1	0	0	0	
14	15	James	5	3.0	1.0	1	2	0	0	0	
15	16	Dan	17	6.0	8.0	2	2	2	1	2	
16	17	Spangler	30	7.0	9.0	3	5	7	1	1	
17	18	Beep	43	15.0	23.0	5	24	3	1	0	
18	19	Forrest	25	10.0	7.0	3	8	0	0	2	
19	20	Lyndon	2	0.0	0.0	0	0	0	0	0	
20	21	Todd	15	4.0	3.0	0	2	2	0	0	
21	22	Blake	16	4.0	5.0	0	6	4	1	0	
22	23	Aroy	4	1.0	0.0	0	0	0	0	1	
23	24	Taylor	2	0.0	0.0	0	1	0	0	0	
24	25	Brett	3	0.0	0.0	0	0	0	0	0	

In [ ]:
```python
df_games = df_full.groupby(['game'])[['atbats', 'run', 'rbi', 'walks', 'sing
df = add_cumulative_stats(df_games)

game_list = []
for i in df_full['game'].unique():
    game_df = df_full.loc[df_full['game']==i]
    game_df_stats = add_cumulative_stats(game_df)
    game_df_stats['game'] = 'Game ' + str(i)
```

```
    game_list.append(game_df_stats)
temporal = pd.concat(game_list)
temporal['Game Number'] = temporal['game'].str.split(' ').str[1].astype(int)
temporal = temporal.sort_values(by='Game Number')
```

```
/Users/joshualambert/Desktop/repos/DadBodBombers/utils.py:118: SettingWithCo
pyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df[['atbats', 'walks', 'single', 'double', 'triple', 'homerun']] = df[['at
bats', 'walks', 'single', 'double', 'triple', 'homerun']].astype(int)
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  df['batting_average'] = (df['single'] + df['double'] + df['triple'] + df
['homerun'])  / (df['atbats'] - df['walks']) * (1000)
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See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
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  df['onbase'] = (df['hits'] + df['walks']) / df['atbats'] * (1000)
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See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df['slugging'] = (df['single'] + (2 * df['double']) + (3 * df['triple']) +
(4 * df['homerun'])) / df['atbats'] * (1000)
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See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df['onbase_plus_slugging'] = df['onbase'] + df['slugging']
/Users/joshualambert/Desktop/repos/DadBodBombers/utils.py:124: SettingWithCo
pyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
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```

See the caveats in the documentation: https://pandas.pydata.org/pandas−docs/
stable/user_guide/indexing.html#returning−a−view−versus−a−copy
  df['total_bases'] = df['single'] + (2 * df['double']) + (3 * df['triple'])
+ (4 * df['homerun'])
/var/folders/8x/qp375g154zg3h3ktpt_8tyqw0000gn/T/ipykernel_74645/1701935579.
py:9: SettingWithCopyWarning:
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See the caveats in the documentation: https://pandas.pydata.org/pandas−docs/
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  game_df_stats['game'] = 'Game ' + str(i)
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See the caveats in the documentation: https://pandas.pydata.org/pandas−docs/
stable/user_guide/indexing.html#returning−a−view−versus−a−copy
  df[['atbats', 'walks', 'single', 'double', 'triple', 'homerun']] = df[['at
bats', 'walks', 'single', 'double', 'triple', 'homerun']].astype(int)
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['homerun']) / (df['atbats'] − df['walks']) * (1000)
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  df['slugging'] = (df['single'] + (2 * df['double']) + (3 * df['triple']) +
(4 * df['homerun'])) / df['atbats'] * (1000)
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```
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  df['onbase_plus_slugging'] = df['onbase'] + df['slugging']
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  df[['atbats', 'walks', 'single', 'double', 'triple', 'homerun']] = df[['at
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```

```
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  df['onbase'] = (df['hits'] + df['walks']) / df['atbats'] * (1000)
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  df['onbase_plus_slugging'] = df['onbase'] + df['slugging']
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  df['onbase'] = (df['hits'] + df['walks']) / df['atbats'] * (1000)
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See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  df['total_bases'] = df['single'] + (2 * df['double']) + (3 * df['triple'])
+ (4 * df['homerun'])
/var/folders/8x/qp375g154zg3h3ktpt_8tyqw0000gn/T/ipykernel_74645/1701935579.
py:9: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/
stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  game_df_stats['game'] = 'Game ' + str(i)
```

```python
In [ ]: gamnumber = temporal.groupby('Game Number')['games_played'].sum().reset_inde
```

```python
In [ ]: avgs = temporal.groupby('Game Number')[['batting_average', 'onbase', 'sluggi

        merged = pd.merge(gamnumber, avgs, on='Game Number')
        merged['Number of players'] = merged['games_played']
```
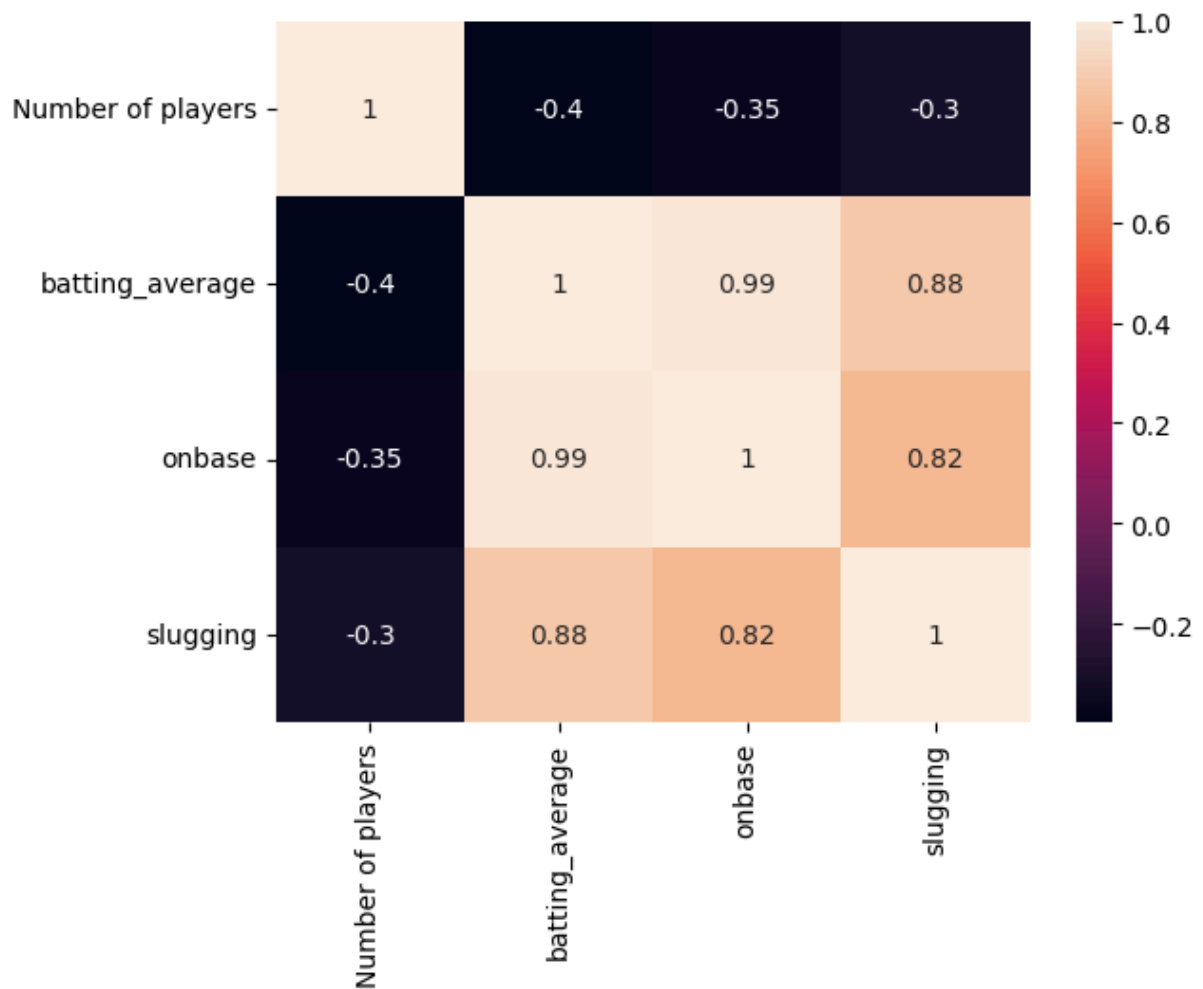
```python
In [ ]: merged
```

Out[ ]:

	Game Number	games_played	batting_average	onbase	slugging	Number of players
0	1	13	653.846154	692.307692	846.153846	13
1	2	10	700.000000	675.000000	675.000000	10
2	3	10	433.333333	450.000000	583.333333	10
3	4	11	378.787879	424.242424	515.151515	11
4	5	11	575.757576	621.212121	1151.515152	11
5	6	10	450.000000	483.333333	616.666667	10
6	7	10	716.666667	733.333333	966.666667	10
7	8	12	416.666667	416.666667	541.666667	12
8	9	10	400.000000	400.000000	800.000000	10
9	10	10	400.000000	450.000000	766.666667	10
10	11	11	469.696970	484.848485	454.545455	11
11	12	10	537.037037	633.333333	550.000000	10
12	13	13	602.564103	602.564103	961.538462	13
13	14	10	683.333333	683.333333	1300.000000	10
14	15	11	742.424242	757.575758	1030.303030	11
15	16	12	756.944444	819.444444	881.944444	12
16	17	13	602.564103	641.025641	846.153846	13
17	18	14	392.857143	428.571429	428.571429	14
18	19	11	621.212121	621.212121	909.090909	11
19	20	10	575.000000	575.000000	658.333333	10
20	21	11	492.424242	583.333333	659.090909	11
21	22	11	303.030303	409.090909	424.242424	11

In [ ]:
```python
correlation = merged.loc[merged['games_played']>11][['Number of players', 'b
correlation
```

Out[ ]:

	Number of players	batting_average	onbase	slugging
Number of players	1.000000	-0.396250	-0.353755	-0.304049
batting_average	-0.396250	1.000000	0.991384	0.877400
onbase	-0.353755	0.991384	1.000000	0.816388
slugging	-0.304049	0.877400	0.816388	1.000000

In [ ]:
```python
corrplot = sns.heatmap(correlation, annot=True)
```


In [ ]: