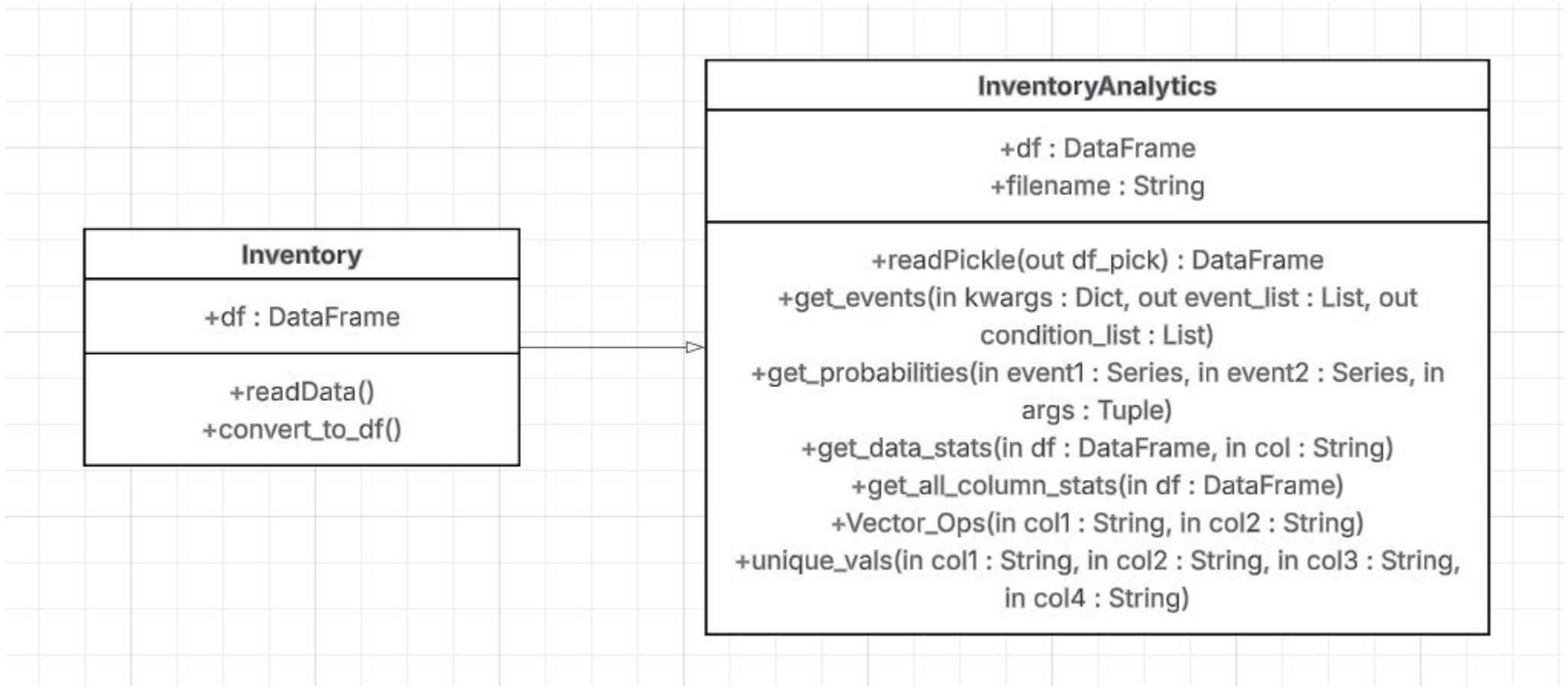
Class diagrams

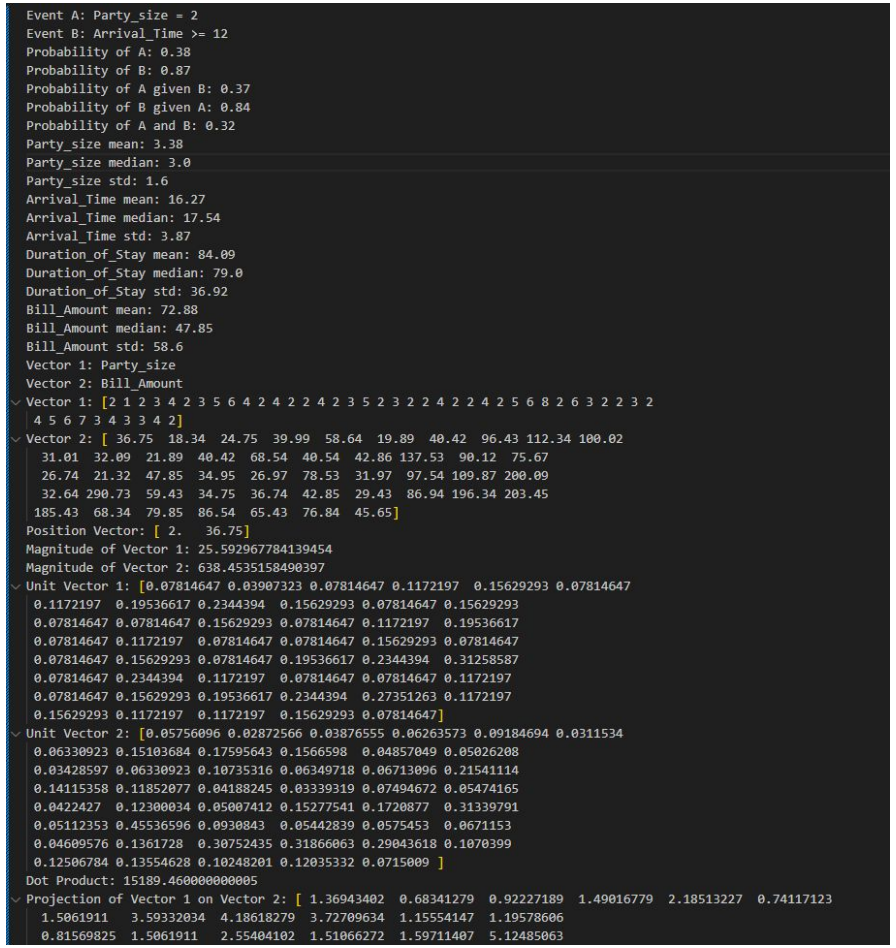


Test Data

Party size	Arrival Time	Duration of Stay	Bill Amount
2	10	90	$36.75
1	10	35	18.34
2	10.13	48	24.75
3	10.47	79	39.99
4	11	120	58.64
2	11.39	74	19.89
3	12	69	40.42
5	12	130	96.43
6	12.03	125	112.34
4	12.06	79	100.02
2	12.2	67	31.01
4	12.25	140	32.09
2	12.38	90	21.89
2	12.58	75	40.42
4	13	102	68.54
2	13.02	85	40.54
3	13.2	109	42.86
5	13.34	134	137.53
2	14.4	47	90.12
3	15.1	87	75.67
2	16.3	75	26.74
2	17	65	21.32
4	17.2	124	47.85
2	17.54	57	34.95
2	18.2	78	26.97
4	18.26	130	78.53
2	18.34	39	31.97
5	18.46	123	97.54
6	18.55	135	109.87
8	18.57	163	200.09
2	19.1	63	32.64
6	19.13	176	290.73
3	19.23	69	59.43
2	19.35	58	34.75
2	19.44	79	36.74
3	19.57	93	42.85
2	20.04	84	29.43
4	20.07	99	86.94
5	20.17	67	196.34
6	20.24	98	203.45
7	20.33	90	185.43
3	20.57	69	68.34
4	21.2	40	79.85
3	21.27	33	86.54
3	21.34	26	65.43
4	21.37	23	76.84
2	21.49	11	45.65

Output

- see full output file in Github



```
Event A: Party_size = 2
Event B: Arrival_Time >= 12
Probability of A: 0.38
Probability of B: 0.87
Probability of A given B: 0.37
Probability of B given A: 0.84
Probability of A and B: 0.32
Party_size mean: 3.38
Party_size median: 3.0
Party_size std: 1.6
Arrival_Time mean: 16.27
Arrival_Time median: 17.54
Arrival_Time std: 3.87
Duration_of_Stay mean: 84.09
Duration_of_Stay median: 79.0
Duration_of_Stay std: 36.92
Bill_Amount mean: 72.88
Bill_Amount median: 47.85
Bill_Amount std: 58.6
Vector 1: Party_size
Vector 2: Bill_Amount
Vector 1: [2 1 2 3 4 2 3 5 6 4 2 4 2 2 4 2 3 5 2 3 2 2 4 2 2 4 2 5 6 8 2 6 3 2 2 3 2
 4 5 6 7 3 4 3 3 4 2]
Vector 2: [ 36.75  18.34  24.75  39.99  58.64  19.89  40.42  96.43 112.34 100.02
  31.01  32.09  21.89  40.42  68.54  40.54  42.86 137.53  90.12  75.67
  26.74  21.32  47.85  34.95  26.97  78.53  31.97  97.54 109.87 200.09
  32.64 290.73  59.43  34.75  36.74  42.85  29.43  86.94 196.34 203.45
 185.43  68.34  79.85  86.54  65.43  76.84  45.65]
Position Vector: [ 2.   36.75]
Magnitude of Vector 1: 25.592967784139454
Magnitude of Vector 2: 638.4535158490397
Unit Vector 1: [0.07814647 0.03907323 0.07814647 0.1172197  0.15629293 0.07814647
 0.1172197  0.19536617 0.2344394  0.15629293 0.07814647 0.15629293
 0.07814647 0.07814647 0.15629293 0.07814647 0.1172197  0.19536617
 0.07814647 0.1172197  0.07814647 0.07814647 0.15629293 0.07814647
 0.07814647 0.15629293 0.07814647 0.19536617 0.2344394  0.31258587
 0.07814647 0.2344394  0.1172197  0.07814647 0.07814647 0.1172197
 0.07814647 0.15629293 0.19536617 0.2344394  0.27351263 0.1172197
 0.15629293 0.1172197  0.1172197  0.15629293 0.07814647]
Unit Vector 2: [0.05756096 0.02872566 0.03876555 0.06263573 0.09184694 0.0311534
 0.06330923 0.15103684 0.17595643 0.1566598  0.04857049 0.05026208
 0.03428597 0.06330923 0.10735316 0.06349718 0.06713096 0.21541114
 0.14115358 0.11852077 0.04188245 0.03339319 0.07494672 0.05474165
 0.0422427  0.12300034 0.05007412 0.15277541 0.1720877  0.31339791
 0.05112353 0.45536596 0.0930843  0.05442839 0.0575453  0.0671153
 0.04609576 0.1361728  0.30752435 0.31866063 0.29043618 0.1070399
 0.12506784 0.13554628 0.10248201 0.12035332 0.0715009 ]
Dot Product: 15189.460000000005
Projection of Vector 1 on Vector 2: [ 1.36943402  0.68341279  0.92227189  1.49016779  2.18513227  0.74117123
  1.5061911   3.59332034  4.18618279  3.72709634  1.15554147  1.19578606
  0.81569825  1.5061911   2.55404102  1.51066272  1.59711407  5.12485063
```

```
Dot Product: 15189.460000000005
Projection of Vector 1 on Vector 2: [ 1.36943402  0.68341279  0.92227189  1.49016779  2.18513227  0.74117123
  1.5061911   3.59332034  4.18618279  3.72709634  1.15554147  1.19578606
  0.81569825  1.5061911   2.55404102  1.51066272  1.59711407  5.12485063
  3.35818759  2.81972986  0.99642628  0.79445805  1.78305899  1.3023597
  1.00499688  2.9263035   1.19131444  3.63468284  4.09414192  7.45605586
  1.21628099 10.83362047  2.21457044  1.294907    1.36906138  1.59674143
  1.09666512  3.23968962  7.31631769  7.58126125  6.90977279  2.54658832
  2.97549133  3.22478422  2.43815151  2.86332816  1.70107926]
Projection of Vector 2 on Vector 1: [ 46.38003053  23.19001527  46.38003053  69.5700458   92.76006107
  46.38003053  69.5700458  115.95007634 139.1400916   92.76006107
  46.38003053  92.76006107  46.38003053  46.38003053  92.76006107
  46.38003053  69.5700458  115.95007634  46.38003053  69.5700458
  46.38003053  46.38003053  92.76006107  46.38003053  46.38003053
  92.76006107  46.38003053 115.95007634 139.1400916  185.52012214
  46.38003053 139.1400916   69.5700458   46.38003053  46.38003053
  69.5700458   46.38003053  92.76006107 115.95007634 139.1400916
 162.33010687  69.5700458   92.76006107  69.5700458   69.5700458
  92.76006107  46.38003053]
Angle between Vectors (degrees): 21.62868765313098
Are the vectors orthogonal? No
Categories in Party_size: [2 1 3 4 5 6 8 7]
Categories in Arrival_Time: [10.   10.13 10.47 11.   11.39 12.   12.03 12.06 12.2  12.25 12.38 12.58
 13.   13.02 13.2  13.34 14.4  15.1  16.3  17.   17.2  17.54 18.2  18.26
 18.34 18.46 18.55 18.57 19.1  19.13 19.23 19.35 19.44 19.57 20.04 20.07
 20.17 20.24 20.33 20.57 21.2  21.27 21.34 21.37 21.49]
Categories in Duration_of_Stay: [ 90  35  48  79 120  74  69 130 125  67 140  75 102  85 109 134  47  87
  65 124  57  78  39 123 135 163  63 176  58  93  84  99  98  40  33  26
  23  11]
Categories in Bill_Amount: [ 36.75  18.34  24.75  39.99  58.64  19.89  40.42  96.43 112.34 100.02
  31.01  32.09  21.89  68.54  40.54  42.86 137.53  90.12  75.67  26.74
  21.32  47.85  34.95  26.97  78.53  31.97  97.54 109.87 200.09  32.64
 290.73  59.43  34.75  36.74  42.85  29.43  86.94 196.34 203.45 185.43
  68.34  79.85  86.54  65.43  76.84  45.65]
Number of unique combinations: 47
Number of unique permutations: 258623241511168180642964355153611979969197632389120000000000
```

Log file

- see full log file in Github

```
File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-12 21:54:09.050060

File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-14 19:52:09.608877

File ..Input/data.csv not found in DataAnalysis.read_csv() function.
2025-04-14 19:57:52.429431

File ..Input/data.csv not found in DataAnalysis.read_csv() function.
2025-04-14 20:01:44.693633

File Input/data.csv not found in DataAnalysis.read_csv() function.
2025-04-14 20:01:53.920204

File ..Input/data.csv not found in DataAnalysis.read_csv() function.
2025-04-14 20:03:15.420710

File Input/data.csv not found in DataAnalysis.read_csv() function.
2025-04-14 20:03:56.777340

File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-14 20:13:01.216775

File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-14 20:13:01.217775

File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-14 20:13:48.454388

File badfile.lol not found in DataAnalysis.read_csv() function.
2025-04-14 20:13:48.454388

File test_pickle.pkl not found in InventoryAnalysis.readPickle() function.
2025-04-27 11:25:27.151471

File test_pickle.pkl not found in InventoryAnalysis.readPickle() function.
2025-04-27 11:25:27.152472

Column Price not found in DataFrame.
2025-04-27 11:28:44.795897

Column Quantity not found in DataFrame.
2025-04-27 11:28:44.795897

Eval error for column Quantity: 'Quantity'
2025-04-27 11:28:44.795897

Column Price not found in DataFrame.
2025-04-27 11:31:10.240735
```

Task Progress report

Date	Task Name	Status	Person
04/20/2025	Work on second Parent/class	In progress	Everyone
04/27/2025	Work PA 3 Report	complete	Everyone
04/27/2025	Class Diagram	complete	Henry