

For task 4, all 6 Datasets are used which are stored in **home/hadoop/input** folder.

Task 4. Writing MapReduce codes to perform the tasks using files we have downloaded on EMR instance:

- a) Which vendors have the most trips and what is the total revenue generated by that vendor?

```
[hadoop@ip-172-31-51-47 ~]$ python mrtask_a.py input > aoutput.txt
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_a.hadoop.20250317.083853.199090
Running step 1 of 2...
Running step 2 of 2...
job output is in /tmp/mrtask_a.hadoop.20250317.083853.199090/output
Streaming final output from /tmp/mrtask_a.hadoop.20250317.083853.199090/output...
Removing temp directory /tmp/mrtask_a.hadoop.20250317.083853.199090...
[hadoop@ip-172-31-51-47 ~]$ cat aoutput.txt
"2"      525037658.13737655
[hadoop@ip-172-31-51-47 ~]$
```

Vendor 2, VeriFone has most trips and revenue generated is 525037658.13

- b) Which pickup location generates the most revenue?

```
[hadoop@ip-172-31-51-47 ~]$ python mrtask_b.py input > boutput.txt
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_b.hadoop.20250317.091632.147203
Running step 1 of 2...
Running step 2 of 2...
job output is in /tmp/mrtask_b.hadoop.20250317.091632.147203/output
Streaming final output from /tmp/mrtask_b.hadoop.20250317.091632.147203/output...
Removing temp directory /tmp/mrtask_b.hadoop.20250317.091632.147203...
[hadoop@ip-172-31-51-47 ~]$ cat boutput.txt
"132"    77196812.23977433
[hadoop@ip-172-31-51-47 ~]$
```

Pickup location 132 generate most revenue, which is 77196812.23

- c) What are the different payment types used by customers and their count?
The final results should be in a sorted format.

```
[hadoop@ip-172-31-51-47 ~]$ python mrtask_c.py input > output.txt
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_c.hadoop.20250317.094145.184011
Running step 1 of 3...
Running step 2 of 3...
Running step 3 of 3...
job output is in /tmp/mrtask_c.hadoop.20250317.094145.184011/output
Streaming final output from /tmp/mrtask_c.hadoop.20250317.094145.184011/output...
Removing temp directory /tmp/mrtask_c.hadoop.20250317.094145.184011...
[hadoop@ip-172-31-51-47 ~]$ cat output.txt
"1"      39754212
"2"      18832370
"3"      306912
"4"      88794
"5"      3
```

Different payment types used by customers with their count

1= Credit card	39754212 times
2= Cash	18832370 times
3= No charge	306912 times
4= Dispute	88794 times
5= Unknown	3 times

- d) What is the average trip time for different pickup locations?

```
[hadoop@ip-172-31-49-52 ~]$ python mrtask_d.py input > output.com
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_d.hadoop.20250317.123839.422237
Running step 1 of 1...
job output is in /tmp/mrtask_d.hadoop.20250317.123839.422237/output
Streaming final output from /tmp/mrtask_d.hadoop.20250317.123839.422237/output...
Removing temp directory /tmp/mrtask_d.hadoop.20250317.123839.422237...
```

```
[hadoop@ip-172-31-49-52 ~]$ cat output.com
"1"      8.186450867972612
"10"     49.76857038591371
"100"    15.451727206090693
"101"    18.519526143790852
"102"    22.112369791666673
"104"    23.616666666666667
"105"    19.977777777777774
"106"    14.142386707811873
"107"    14.170103283247819
"108"    14.2084142394822
"109"    60.776282051282045
"11"     17.169207317073173
"110"    3.183333333333333
"111"    11.634657836644594
"112"    14.446112860892391
```

"113"	14.999849531931515
"114"	15.921296462978074
"115"	14.100138312586449
"116"	15.6378321733263
"117"	19.31763565891473
"118"	12.259841269841267
"119"	16.320988640397587
"12"	24.358713440236162
"120"	13.808120868744098
"121"	14.144444444444444
"122"	27.16283333333333
"123"	15.514665127020788
"124"	28.927140549273023
"125"	15.899441602989004
"126"	18.561778731521223
"127"	15.566097332709415
"128"	14.897942905121747
"129"	14.25869664200341
"13"	19.502000159626316
"130"	35.16673755689873
"131"	14.111753902662993
"132"	43.77028871964134
"133"	16.605919973761882
"134"	15.84854374498337
"135"	18.103793774319062
"136"	11.392984869325996
"137"	13.785309907042658
"138"	37.322487035738206
"139"	59.65673076923077
"14"	16.86699357650837
"140"	13.928656550468277
"141"	12.262026243285568
"142"	13.862745217439619
"143"	13.114742778188873
"144"	16.803778739969555
"145"	12.773806451317661
"146"	15.048244012458394
"147"	13.154071246819335
"148"	16.668522984065728
"149"	16.728644067796612
"15"	14.541896024464831
"150"	18.492307692307694
"151"	13.21462795906499
"152"	14.159447307099015
"153"	13.562989801395599
"154"	24.45357142857143
"155"	27.028838383838384
"156"	19.404368932038835
"157"	20.50430167597765

"158"	16.61986339983278
"159"	14.204843982169397
"16"	21.921666666666667
"160"	20.065231092436978
"161"	15.588043428280473
"162"	15.103685552025471
"163"	15.86274999001132
"164"	15.424552738208558
"165"	18.458268590455052
"166"	14.844402353615047
"167"	14.99343398034987
"168"	12.855600663523663
"169"	15.798503166378811
"17"	14.029984432134965
"170"	14.685756051764013
"171"	12.873132183908044
"172"	15.978240740740741
"173"	14.653036053130936
"174"	13.067625899280575
"175"	12.79583333333333
"176"	30.772619047619052
"177"	19.160660562459125
"178"	6.809167604049495
"179"	14.502859519376639
"18"	14.326474820143885
"180"	30.037775246772974
"181"	15.849550569734543
"182"	13.937760814249362
"183"	12.080208333333331
"184"	16.71470588235294
"185"	18.767688679245282
"186"	16.811887227994603
"187"	38.99130434782609
"188"	16.133771704730137
"189"	15.166321270502477
"19"	12.450746268656715
"190"	19.285945663531873
"191"	16.42855450236967
"192"	18.24926590538336
"193"	14.370130099617874
"194"	24.98838654642944
"195"	20.830252339098376
"196"	17.658003230790843
"197"	15.662662013958126
"198"	13.249704098239386
"199"	17.451587301587303
"2"	38.165942028985505
"20"	14.108603491271818
"200"	12.831729264475742
"201"	9.882394366197182
"202"	16.21168807339449
"203"	27.16499330655957
"204"	3.5511904761904773
"205"	25.105478395061727

"206"	13.60748299319728
"207"	8.466067108446406
"208"	26.57637860082305
"209"	19.135244233080936
"21"	20.498177083333335
"210"	17.948028169014087
"211"	16.76486161838833
"212"	21.123603839441536
"213"	16.38755186721992
"214"	9.997727272727277
"215"	48.54615384615384
"216"	28.418558295765926
"217"	17.58179810557684
"218"	20.67351945854484
"219"	45.45268452582797
"22"	21.920180061484412
"220"	12.07077821011673
"221"	14.373676680972823
"222"	29.712301587301585
"223"	14.933757307290472
"224"	13.71310755279811
"225"	14.926513473606498
"226"	16.553316516925022
"227"	14.551161290322582
"228"	15.833887297039162
"229"	13.281866325145364
"23"	12.765217391304347
"230"	16.930732667330425
"231"	16.844082243497862
"232"	17.1936635595549
"233"	15.269118834293323
"234"	15.002941362166164
"235"	16.92060557341908
"236"	12.747239751606452
"237"	12.36568689541058
"238"	12.907283813308903
"239"	13.12608820198439
"24"	13.555459891591275
"240"	14.076029962546816
"241"	15.209362987369579
"242"	14.231421677802524
"243"	16.346816612643956
"244"	16.83309346436308
"245"	8.677222222222222
"246"	15.718104183838523
"247"	16.078691837963362
"248"	15.71924473493101
"249"	14.940339887463725
"25"	15.483484374354518
"250"	16.76273352999017
"251"	11.8752688172043
"252"	19.827375
"253"	22.277659574468085
"254"	19.044134078212284

"255"	16.321390202360654
"256"	16.11150743129169
"257"	15.420086767895873
"258"	20.483721431651578
"259"	15.158308605341247
"26"	11.983088803088801
"260"	15.50737982706822
"261"	21.849842657463906
"262"	12.843559332956204
"263"	12.159215838037317
"264"	14.775037341482674
"265"	9.502508024311943
"27"	8.77878787878788
"28"	28.173525921869306
"29"	21.906332703213614
"3"	21.662626262626265
"30"	25.1015873015873
"31"	24.91533078880407
"32"	20.141068580542267
"33"	18.09515868157682
"34"	15.864830368906453
"35"	19.435623073535883
"36"	16.873465169270823
"37"	16.128120727549625
"38"	50.98867102396514
"39"	18.23436357593885
"4"	14.994658890266358
"40"	16.212705440212666
"41"	12.956678529226906
"42"	12.959889655721868
"43"	15.613800432104464
"44"	11.74047619047619
"45"	18.46525038820368
"46"	17.604385964912282
"47"	16.59013605442177
"48"	14.690364201807505
"49"	13.98831907671419
"5"	11.444871794871794
"50"	14.866827094724519
"51"	16.27702380952381
"52"	17.332517617264926
"53"	17.14744588744589
"54"	17.03246471226927
"55"	24.754869281045753
"56"	20.11287128712871
"57"	14.428294573643411
"58"	6.4692307692307685
"59"	16.8166666666666666
"6"	7.501923076923077
"60"	12.572296296296296
"61"	15.336157115469009
"62"	15.302549226441633
"63"	19.201780253385767
"64"	13.288849765258215

"65"	16.960852573062787
"66"	17.815385709115347
"67"	19.378268398268396
"68"	15.325824733341799
"69"	16.737164073550215
"7"	13.26416802933452
"70"	25.207598586309505
"71"	16.3141975308642
"72"	19.675488721804506
"73"	20.807931034482756
"74"	12.628689556954285
"75"	12.912284473764714
"76"	21.72324318787134
"77"	19.922931442080376
"78"	12.958470353761834
"79"	15.190480474613809
"8"	17.490176908752332
"80"	15.157747494884838
"81"	13.03324958123953
"82"	14.641168566931547
"83"	15.877727292119964
"84"	11.774166666666667
"85"	19.751419667590028
"86"	14.451282051282051
"87"	20.44241956084242
"88"	21.651543974983298
"89"	15.994494320263838
"9"	84.49022346368714
"90"	14.177380536854745
"91"	20.863813989839784
"92"	17.52318349387561
"93"	33.988380468938836
"94"	19.33594527363184
"95"	17.861217802164308
"96"	15.73273381294964
"97"	15.708167304502096
"98"	12.256024096385541
"99"	12.726666666666668

- e) Calculate the average trip to revenue ratio of the drivers for different pickup locations in sorted format.

```
[hadoop@ip-172-31-49-52 ~]$ python mrtask_e.py input > eoutput.com
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_e.hadoop.20250317.135914.522296
Running step 1 of 1...
job output is in /tmp/mrtask_e.hadoop.20250317.135914.522296/output
Streaming final output from /tmp/mrtask_e.hadoop.20250317.135914.522296/output...
Removing temp directory /tmp/mrtask_e.hadoop.20250317.135914.522296...
```

```
[hadoop@ip-172-31-49-52 ~]$ cat eoutput.com
"1"      0.11931462821703105
"10"     0.10761668826560969
"100"    0.10176112040915351
"101"    0.10391200650224516
"102"    0.09286325213174122
"104"    0.2000665778961385
"105"    0.08289275441720312
"106"    0.11182299192052364
"107"    0.11974753027359895
"108"    0.08561073480894171
"109"    0.17861970356364315
"11"     0.0661192351337736
"110"    0.0
"111"    0.10175458286569398
"112"    0.10939659242522957
"113"    0.11854772693404092
"114"    0.11737171385735727
"115"    0.09805645544907125
"116"    0.09022031542010879
"117"    0.1654611532154412
"118"    0.11728963561178402
"119"    0.06778234295101962
"12"     0.08816912666409894
"120"    0.08303252748719832
"121"    0.09104834906722979
"122"    0.1324025567728717
"123"    0.11055898094072132
"124"    0.08450445139029457
"125"    0.12389238738088933
"126"    0.07223106849013396
"127"    0.0883881479101132
"128"    0.10195419121098451
"129"    0.06331017333925708
"13"     0.12263264632350745
"130"    0.10459971957672509
"131"    0.08338783482815326
"132"    0.10404480517971455
"133"    0.09428655857404496
"134"    0.10749874267013142
"135"    0.0911299209238622
"136"    0.040904378620177866
"137"    0.11277472565909867
"138"    0.13191299589451488
"139"    0.09244706142211938
"14"     0.09044594848522661
"140"    0.11118444211882265
"141"    0.10768193607229856
"142"    0.11242578567791539
"143"    0.11408622408790879
"144"    0.11283013521681716
"145"    0.09530064643710613
"146"    0.08853658145674995
"147"    0.044604149528370954
```

"148"	0.11466547302894878
"149"	0.08233859572151557
"15"	0.11600468842514836
"150"	0.10406209924668995
"151"	0.10736778554964785
"152"	0.08319834814829094
"153"	0.06056373253577944
"154"	0.09108097210043589
"155"	0.09633375755470427
"156"	0.08792537666968166
"157"	0.10078849415880735
"158"	0.11639038989036432
"159"	0.046638005623141354
"16"	0.12347342980892902
"160"	0.0964770581925177
"161"	0.11359049234432181
"162"	0.12066632396991181
"163"	0.11222164046430201
"164"	0.11217684253877191
"165"	0.06797416237704265
"166"	0.11278675284130736
"167"	0.061222523830325365
"168"	0.04962075987818003
"169"	0.06451074143663851
"17"	0.0831753690145573
"170"	0.1180831528228667
"171"	0.08052993314534218
"172"	0.17223686242471645
"173"	0.06008145804370072
"174"	0.06278143350842437
"175"	0.1277230776008282
"176"	0.15889955267208697
"177"	0.07641696352884493
"178"	0.12194781013939295
"179"	0.08477276212069997
"18"	0.0524197165008557
"180"	0.1052369675037582
"181"	0.11303400885962861
"182"	0.04956118360347687
"183"	0.05853409985743475
"184"	0.11633468693321349
"185"	0.07530969983194845
"186"	0.10977067019800792
"187"	0.17978913134704155
"188"	0.074385311152267
"189"	0.1119751542864047
"19"	0.07943494943114217
"190"	0.1014757890937184
"191"	0.12487168062809832
"192"	0.07124383780662931
"193"	0.04602694182348739
"194"	0.12129343435403594
"195"	0.10463665842928407
"196"	0.08616922680964317

"197"	0.09057550505118174
"198"	0.08806313330584321
"199"	0.14024694882592245
"2"	0.10551996408687953
"20"	0.07539779360644343
"200"	0.10311919266153373
"201"	0.15164728494049584
"202"	0.09722093931447431
"203"	0.08922376129095638
"204"	0.06247952716655987
"205"	0.08302284089547911
"206"	0.08357280929682973
"207"	0.07416425281278778
"208"	0.07718716885014355
"209"	0.11438950713882942
"21"	0.08297404683405195
"210"	0.12696291028237974
"211"	0.11399355397886336
"212"	0.0745999161203453
"213"	0.09930916492713443
"214"	0.07745375602878149
"215"	0.10829221671091685
"216"	0.1047977854673509
"217"	0.07433903922530714
"218"	0.09787185841442562
"219"	0.10013130970242783
"22"	0.06303381261429236
"220"	0.07548055451382411
"221"	0.10296610645201132
"222"	0.09461551127943356
"223"	0.096573195119441
"224"	0.11526880032064273
"225"	0.08262074885724559
"226"	0.0855443843085769
"227"	0.08060571925596921
"228"	0.09725404075367698
"229"	0.11256386704354808
"23"	0.11893642866783644
"230"	0.10760970767466073
"231"	0.11887862152337181
"232"	0.08364178523168796
"233"	0.11587691604703067
"234"	0.12013283079550377
"235"	0.05148549299609717
"236"	0.1110819552646829
"237"	0.10990442459614658
"238"	0.11044770763082125
"239"	0.11135965083848391
"24"	0.10590891911113501
"240"	0.0710554459113096
"241"	0.06142723563688842
"242"	0.07134362315468347
"243"	0.09649751817937276
"244"	0.09413161238217022

"245"	0.0881231334711693
"246"	0.11961317882565423
"247"	0.07294934365907851
"248"	0.05406105607423326
"249"	0.11990213646701033
"25"	0.10931197115094779
"250"	0.057044008706736926
"251"	0.08299641950457239
"252"	0.11791966686185029
"253"	0.09444941923267383
"254"	0.04539094268441643
"255"	0.11685699515470246
"256"	0.10853673778737459
"257"	0.11311365670211637
"258"	0.11397415106035941
"259"	0.0871756711724033
"26"	0.06577859806429139
"260"	0.07000191673137858
"261"	0.107666192430488
"262"	0.11338221978041224
"263"	0.11388129538441702
"264"	0.11265242617782133
"265"	0.11224718082319467
"27"	0.08809887044827637
"28"	0.10225113334394068
"29"	0.0657365267570085
"3"	0.06985350809560523
"30"	0.25610758750293633
"31"	0.09122118342582712
"32"	0.06109787327761727
"33"	0.12071128564971498
"34"	0.10658808178106176
"35"	0.10022554243576683
"36"	0.10580489050473714
"37"	0.09921178378979262
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- f) How does revenue vary over time? Calculate the average trip revenue per month – analyzing it by hour of the day (day vs night) and the day of the week (weekday vs weekend).

```
[hadoop@ip-172-31-49-52 ~]$ python mrtask_f.py input > foutput.com
No configs found; falling back on auto-configuration
No configs specified for inline runner
Creating temp directory /tmp/mrtask_f.hadoop.20250317.141937.109986
Running step 1 of 1...
job output is in /tmp/mrtask_f.hadoop.20250317.141937.109986/output
Streaming final output from /tmp/mrtask_f.hadoop.20250317.141937.109986/output...
Removing temp directory /tmp/mrtask_f.hadoop.20250317.141937.109986...
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