Task 1:

```
-----------------------------------------------------

 Number of users: 182
 Number of activities: 16048
 Number of trackpoints: 9677032


-----------------------------------------------------
```

Task 2:

```
-----------------------------------------------------

 Average number of activities per user: 88.17582417582418


-----------------------------------------------------
```

Task3:

```
-----------------------------------------------------

Top 20 users with most activities:
   User ID    Activity count
 ---------   ------------------
     128                 2102
     153                 1793
     025                  715
     163                  704
     062                  691
     144                  563
     041                  399
     085                  364
     004                  346
     140                  345
     167                  320
     068                  280
     017                  265
     003                  261
     014                  236
     126                  215
     030                  210
     112                  208
     011                  201
     039                  198


-----------------------------------------------------
```

Task 4:

```
————————————————————————————————————————————
Users who have taken a taxi:
010
058
062
078
080
085
098
111
128
163

————————————————————————————————————————————
```

Task 5:

```
————————————————————————————————————————————————————
Transportation modes and their activity counts (sorted by count):
walk: 480
car: 419
bike: 263
bus: 199
subway: 133
taxi: 37
airplane: 3
train: 2
run: 1
boat: 1

————————————————————————————————————————————————————
```

Task 6:

```
————————————————————————————————————————————————————
Year with most activities: 2008 (Activities: 5895)
Year with most recorded hours: 2009 (Total Hours: 9165)
No, the year with the most recorded hours is 2009.

————————————————————————————————————————————————————
```

Task 7:


```
Total distance walked by user 112 in 2008: 3316.68 km
```

Task 8:


```
Processing altitude gains: 100%|                                                    | 9677031/9677031 [00:02<00:00, 4547024.03trackpoints/s]
Top 20 Users by Altitude Gain (User ID, Total Meters Gained):
+---------+--------------------+
| User ID | Total Meters Gained |
+---------+--------------------+
|   128   |      688503        |
|   153   |      675369        |
|   004   |      357836        |
|   041   |      280459        |
|   062   |      258163        |
|   003   |      249358        |
|   163   |      246264        |
|   085   |      239369        |
|   144   |      224733        |
|   030   |      183702        |
|   039   |      161082        |
|   025   |      149772        |
|   084   |      145661        |
|   167   |      130387        |
|   000   |      130186        |
|   002   |      126000        |
|   140   |      112743        |
|   037   |      111803        |
|   126   |      105310        |
|   034   |      99287.1       |
+---------+--------------------+
```

```
Processing altitude gains: 100%|
Top 20 Users by Altitude Gain (User ID, Total Meters Gained):
+------------+----------------------+
|  User ID   |  Total Meters Gained |
+============+======================+
|        128 |               688503 |
+------------+----------------------+
|        153 |               675369 |
+------------+----------------------+
|        004 |               357836 |
+------------+----------------------+
|        041 |               280459 |
+------------+----------------------+
|        062 |               258163 |
+------------+----------------------+
|        003 |               249358 |
+------------+----------------------+
|        163 |               246264 |
+------------+----------------------+
|        085 |               239369 |
+------------+----------------------+
|        144 |               224733 |
+------------+----------------------+
|        030 |               183702 |
+------------+----------------------+
|        039 |               161082 |
+------------+----------------------+
|        025 |               149772 |
+------------+----------------------+
|        084 |               145661 |
+------------+----------------------+
|        167 |               130387 |
+------------+----------------------+
|        000 |               130186 |
+------------+----------------------+
|        002 |               126000 |
+------------+----------------------+
|        140 |               112743 |
+------------+----------------------+
|        037 |               111803 |
+------------+----------------------+
|        126 |               105310 |
+------------+----------------------+
|        034 |              99287.1 |
+------------+----------------------+
```

Task 9:

```
Users with Invalid Activities (User ID, Invalid Activity Count):
User 128: 720 invalid activities
User 153: 557 invalid activities
User 025: 263 invalid activities
User 062: 249 invalid activities
User 163: 233 invalid activities
User 004: 219 invalid activities
User 041: 201 invalid activities
User 085: 184 invalid activities
User 003: 179 invalid activities
User 144: 157 invalid activities
User 039: 147 invalid activities
User 068: 139 invalid activities
User 167: 134 invalid activities
User 017: 129 invalid activities
User 014: 118 invalid activities
User 030: 112 invalid activities
User 126: 105 invalid activities
User 000: 101 invalid activities
User 092: 101 invalid activities
User 037: 100 invalid activities
User 084: 99 invalid activities
User 002: 98 invalid activities
User 104: 97 invalid activities
User 034: 88 invalid activities
User 140: 86 invalid activities
User 112: 67 invalid activities
User 091: 63 invalid activities
User 038: 58 invalid activities
User 115: 58 invalid activities
User 022: 55 invalid activities
User 042: 55 invalid activities
User 174: 54 invalid activities
User 142: 52 invalid activities
User 015: 46 invalid activities
User 101: 46 invalid activities
User 001: 45 invalid activities
User 005: 45 invalid activities
User 010: 44 invalid activities
User 052: 44 invalid activities
User 012: 43 invalid activities
User 089: 40 invalid activities
User 028: 36 invalid activities
User 051: 36 invalid activities
User 096: 35 invalid activities
User 036: 34 invalid activities
User 067: 33 invalid activities
User 011: 32 invalid activities
User 044: 32 invalid activities
User 009: 31 invalid activities
User 019: 31 invalid activities
User 134: 31 invalid activities
User 007: 30 invalid activities
User 147: 30 invalid activities
User 155: 30 invalid activities
User 013: 29 invalid activities
User 071: 29 invalid activities
User 179: 28 invalid activities
User 018: 27 invalid activities
User 024: 27 invalid activities
User 082: 27 invalid activities
User 065: 26 invalid activities
User 111: 26 invalid activities
User 029: 25 invalid activities
User 125: 25 invalid activities
User 103: 24 invalid activities
User 035: 23 invalid activities
User 119: 22 invalid activities
User 043: 21 invalid activities
User 016: 20 invalid activities
User 020: 20 invalid activities
User 074: 19 invalid activities
User 078: 19 invalid activities
User 168: 19 invalid activities
User 026: 18 invalid activities
User 073: 18 invalid activities
User 006: 17 invalid activities
User 040: 17 invalid activities
User 110: 17 invalid activities
User 008: 16 invalid activities
User 057: 16 invalid activities
User 081: 16 invalid activities
```

```
User 181: 14 invalid activities
User 046: 13 invalid activities
User 058: 13 invalid activities
User 102: 13 invalid activities
User 032: 12 invalid activities
User 061: 12 invalid activities
User 139: 12 invalid activities
User 023: 11 invalid activities
User 088: 11 invalid activities
User 099: 11 invalid activities
User 131: 10 invalid activities
User 138: 10 invalid activities
User 105: 9 invalid activities
User 157: 9 invalid activities
User 158: 9 invalid activities
User 162: 9 invalid activities
User 169: 9 invalid activities
User 172: 9 invalid activities
User 050: 8 invalid activities
User 063: 8 invalid activities
User 076: 8 invalid activities
User 130: 8 invalid activities
User 176: 8 invalid activities
User 021: 7 invalid activities
User 045: 7 invalid activities
User 053: 7 invalid activities
User 056: 7 invalid activities
User 064: 7 invalid activities
User 146: 7 invalid activities
User 161: 7 invalid activities
User 047: 6 invalid activities
User 066: 6 invalid activities
User 069: 6 invalid activities
User 075: 6 invalid activities
User 080: 6 invalid activities
User 122: 6 invalid activities
User 129: 6 invalid activities
User 136: 6 invalid activities
User 164: 6 invalid activities
User 059: 5 invalid activities
User 070: 5 invalid activities
User 086: 5 invalid activities
User 098: 5 invalid activities
User 108: 5 invalid activities
User 135: 5 invalid activities
User 145: 5 invalid activities
User 159: 5 invalid activities
User 173: 5 invalid activities
User 093: 4 invalid activities
User 095: 4 invalid activities
User 121: 4 invalid activities
User 124: 4 invalid activities
User 127: 4 invalid activities
User 133: 4 invalid activities
User 175: 4 invalid activities
User 031: 3 invalid activities
User 077: 3 invalid activities
User 087: 3 invalid activities
User 090: 3 invalid activities
User 100: 3 invalid activities
User 106: 3 invalid activities
User 109: 3 invalid activities
User 114: 3 invalid activities
User 117: 3 invalid activities
User 118: 3 invalid activities
User 123: 3 invalid activities
User 132: 3 invalid activities
User 171: 3 invalid activities
User 027: 2 invalid activities
User 033: 2 invalid activities
User 054: 2 invalid activities
User 072: 2 invalid activities
User 079: 2 invalid activities
User 152: 2 invalid activities
User 165: 2 invalid activities
User 166: 2 invalid activities
User 170: 2 invalid activities
User 180: 2 invalid activities
User 048: 1 invalid activities
User 060: 1 invalid activities
User 107: 1 invalid activities
User 113: 1 invalid activities
User 141: 1 invalid activities
User 151: 1 invalid activities
_____
```

Task 10:

```
_____
Users who have tracked an activity in the Forbidden City (with tolerance):
User ID: 131
User ID: 018
User ID: 019
User ID: 004

_____
```

Task 11:

```
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Finding users with their most used transportation mode...

Most used transportation modes per user:
User ID: 010, Most Used Mode: taxi
User ID: 020, Most Used Mode: bike
User ID: 021, Most Used Mode: walk
User ID: 052, Most Used Mode: bus
User ID: 056, Most Used Mode: bike
User ID: 058, Most Used Mode: walk
User ID: 060, Most Used Mode: walk
User ID: 062, Most Used Mode: bus
User ID: 064, Most Used Mode: bike
User ID: 065, Most Used Mode: bike
User ID: 067, Most Used Mode: walk
User ID: 069, Most Used Mode: bike
User ID: 073, Most Used Mode: walk
User ID: 075, Most Used Mode: walk
User ID: 076, Most Used Mode: car
User ID: 078, Most Used Mode: walk
User ID: 080, Most Used Mode: taxi
User ID: 081, Most Used Mode: bike
User ID: 082, Most Used Mode: walk
User ID: 084, Most Used Mode: walk
User ID: 085, Most Used Mode: walk
User ID: 086, Most Used Mode: car
User ID: 087, Most Used Mode: walk
User ID: 089, Most Used Mode: car
User ID: 091, Most Used Mode: bus
User ID: 092, Most Used Mode: bus
User ID: 097, Most Used Mode: bike
User ID: 098, Most Used Mode: taxi
User ID: 101, Most Used Mode: car
User ID: 102, Most Used Mode: bike
User ID: 107, Most Used Mode: walk
User ID: 108, Most Used Mode: walk
User ID: 111, Most Used Mode: taxi
User ID: 112, Most Used Mode: walk
User ID: 115, Most Used Mode: car
User ID: 117, Most Used Mode: walk
User ID: 125, Most Used Mode: bike
User ID: 126, Most Used Mode: bike
User ID: 128, Most Used Mode: car
User ID: 136, Most Used Mode: walk
User ID: 138, Most Used Mode: bike
User ID: 139, Most Used Mode: bike
User ID: 144, Most Used Mode: walk
User ID: 153, Most Used Mode: walk
User ID: 161, Most Used Mode: walk
User ID: 163, Most Used Mode: bike
User ID: 167, Most Used Mode: bike
User ID: 175, Most Used Mode: bus

--------------------------------------------------
```