

# repex - separating date time

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## 1 Example data

Table 1: Example data

	driver	ping_time
1	bar	2015-05-27 16:12:00
2	bar	2015-05-27 16:31:00
3	bar	2015-05-27 16:39:00
4	bar	2015-05-27 16:53:00
5	bar	2015-05-27 17:29:00
6	bar	2015-05-27 17:41:00
7	bar	2015-05-27 17:58:00
8	bar	2015-05-27 18:09:00
9	bar	2015-05-27 18:23:00
10	bar	2015-05-27 18:43:00
11	foo	2015-05-27 07:11:00
12	foo	2015-05-27 07:25:00
13	foo	2015-05-27 07:35:00
14	foo	2015-05-27 07:42:00
15	foo	2015-05-27 07:53:00
16	foo	2015-05-27 08:09:00
17	foo	2015-05-27 08:23:00
18	foo	2015-05-27 08:39:00
19	foo	2015-05-27 08:52:00
20	foo	2015-05-27 09:12:00

## 2 Solution 1: floor cumulative time

### 2.1 Separate ping using flag0

Table 2: Flagged ping data (solution 1)

	ping_id	driver	ping_time	cum_mins	flag0
1	1	bar	2015-05-27 16:12:00	0	0
2	2	bar	2015-05-27 16:31:00	19	0
3	3	bar	2015-05-27 16:39:00	27	0
4	4	bar	2015-05-27 16:53:00	41	1
5	5	bar	2015-05-27 17:29:00	77	2
6	6	bar	2015-05-27 17:41:00	89	2
7	7	bar	2015-05-27 17:58:00	106	3
8	8	bar	2015-05-27 18:09:00	117	3
9	9	bar	2015-05-27 18:23:00	131	4
10	10	bar	2015-05-27 18:43:00	151	5
11	11	foo	2015-05-27 07:11:00	0	0
12	12	foo	2015-05-27 07:25:00	14	0
13	13	foo	2015-05-27 07:35:00	24	0
14	14	foo	2015-05-27 07:42:00	31	1
15	15	foo	2015-05-27 07:53:00	42	1
16	16	foo	2015-05-27 08:09:00	58	1
17	17	foo	2015-05-27 08:23:00	72	2
18	18	foo	2015-05-27 08:39:00	88	2
19	19	foo	2015-05-27 08:52:00	101	3
20	20	foo	2015-05-27 09:12:00	121	4

### 2.2 Construct trips data

Table 3: Constructed trips data (solution 1)

	trip_id	driver	start_time	end_time	cum_mins
1	1	bar	2015-05-27 16:12:00	2015-05-27 16:39:00	0
2	2	bar	2015-05-27 16:39:00	2015-05-27 16:53:00	27
3	3	bar	2015-05-27 16:53:00	2015-05-27 17:41:00	41
4	4	bar	2015-05-27 17:41:00	2015-05-27 18:09:00	89
5	5	bar	2015-05-27 18:09:00	2015-05-27 18:23:00	117
6	6	bar	2015-05-27 18:23:00	2015-05-27 18:43:00	131
7	7	foo	2015-05-27 07:11:00	2015-05-27 07:35:00	0
8	8	foo	2015-05-27 07:35:00	2015-05-27 08:09:00	24
9	9	foo	2015-05-27 08:09:00	2015-05-27 08:39:00	58
10	10	foo	2015-05-27 08:39:00	2015-05-27 08:52:00	88
11	11	foo	2015-05-27 08:52:00	2015-05-27 09:12:00	101

## 2.3 Merge trip\_df back to ping\_df to have a common id

Table 4: Merged ping and trips data (solution 1)

	ping_id	driver	ping_time	trip_id	start_time	end_time
1	1	bar	2015-05-27 16:12:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
2	2	bar	2015-05-27 16:31:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
3	3	bar	2015-05-27 16:39:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
4	3	bar	2015-05-27 16:39:00	2	2015-05-27 16:39:00	2015-05-27 16:53:00
5	4	bar	2015-05-27 16:53:00	2	2015-05-27 16:39:00	2015-05-27 16:53:00
6	4	bar	2015-05-27 16:53:00	3	2015-05-27 16:53:00	2015-05-27 17:41:00
7	5	bar	2015-05-27 17:29:00	3	2015-05-27 16:53:00	2015-05-27 17:41:00
8	6	bar	2015-05-27 17:41:00	3	2015-05-27 16:53:00	2015-05-27 17:41:00
9	6	bar	2015-05-27 17:41:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
10	7	bar	2015-05-27 17:58:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
11	8	bar	2015-05-27 18:09:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
12	8	bar	2015-05-27 18:09:00	5	2015-05-27 18:09:00	2015-05-27 18:23:00
13	9	bar	2015-05-27 18:23:00	5	2015-05-27 18:09:00	2015-05-27 18:23:00
14	9	bar	2015-05-27 18:23:00	6	2015-05-27 18:23:00	2015-05-27 18:43:00
15	10	bar	2015-05-27 18:43:00	6	2015-05-27 18:23:00	2015-05-27 18:43:00
16	11	foo	2015-05-27 07:11:00	7	2015-05-27 07:11:00	2015-05-27 07:35:00
17	12	foo	2015-05-27 07:25:00	7	2015-05-27 07:11:00	2015-05-27 07:35:00
18	13	foo	2015-05-27 07:35:00	7	2015-05-27 07:11:00	2015-05-27 07:35:00
19	13	foo	2015-05-27 07:35:00	8	2015-05-27 07:35:00	2015-05-27 08:09:00
20	14	foo	2015-05-27 07:42:00	8	2015-05-27 07:35:00	2015-05-27 08:09:00
21	15	foo	2015-05-27 07:53:00	8	2015-05-27 07:35:00	2015-05-27 08:09:00
22	16	foo	2015-05-27 08:09:00	8	2015-05-27 07:35:00	2015-05-27 08:09:00
23	16	foo	2015-05-27 08:09:00	9	2015-05-27 08:09:00	2015-05-27 08:39:00
24	17	foo	2015-05-27 08:23:00	9	2015-05-27 08:09:00	2015-05-27 08:39:00
25	18	foo	2015-05-27 08:39:00	9	2015-05-27 08:09:00	2015-05-27 08:39:00
26	18	foo	2015-05-27 08:39:00	10	2015-05-27 08:39:00	2015-05-27 08:52:00
27	19	foo	2015-05-27 08:52:00	10	2015-05-27 08:39:00	2015-05-27 08:52:00
28	19	foo	2015-05-27 08:52:00	11	2015-05-27 08:52:00	2015-05-27 09:12:00
29	20	foo	2015-05-27 09:12:00	11	2015-05-27 08:52:00	2015-05-27 09:12:00

### 3 Solution 2: round cumulative time to nearest half hour

#### 3.1 Separate ping using flag0

Table 5: Flagged ping data (solution 2)

	ping_id	driver	ping_time	cum_mins	flag0
1	1	bar	2015-05-27 16:12:00	0	0
2	2	bar	2015-05-27 16:31:00	19	0
3	3	bar	2015-05-27 16:39:00	27	0
4	4	bar	2015-05-27 16:53:00	41	1
5	5	bar	2015-05-27 17:29:00	77	1
6	6	bar	2015-05-27 17:41:00	89	2
7	7	bar	2015-05-27 17:58:00	106	3
8	8	bar	2015-05-27 18:09:00	117	3
9	9	bar	2015-05-27 18:23:00	131	4
10	10	bar	2015-05-27 18:43:00	151	4
11	11	foo	2015-05-27 07:11:00	0	0
12	12	foo	2015-05-27 07:25:00	14	0
13	13	foo	2015-05-27 07:35:00	24	0
14	14	foo	2015-05-27 07:42:00	31	0
15	15	foo	2015-05-27 07:53:00	42	1
16	16	foo	2015-05-27 08:09:00	58	1
17	17	foo	2015-05-27 08:23:00	72	2
18	18	foo	2015-05-27 08:39:00	88	2
19	19	foo	2015-05-27 08:52:00	101	3
20	20	foo	2015-05-27 09:12:00	121	3

#### 3.2 construct trips data

Table 6: Constructed trips data (solution 2)

	trip_id	driver	start_time	end_time	cum_mins
1	1	bar	2015-05-27 16:12:00	2015-05-27 16:39:00	0
2	2	bar	2015-05-27 16:39:00	2015-05-27 17:29:00	27
3	3	bar	2015-05-27 17:29:00	2015-05-27 17:41:00	77
4	4	bar	2015-05-27 17:41:00	2015-05-27 18:09:00	89
5	5	bar	2015-05-27 18:09:00	2015-05-27 18:43:00	117
6	6	foo	2015-05-27 07:11:00	2015-05-27 07:42:00	0
7	7	foo	2015-05-27 07:42:00	2015-05-27 08:09:00	31
8	8	foo	2015-05-27 08:09:00	2015-05-27 08:39:00	58
9	9	foo	2015-05-27 08:39:00	2015-05-27 09:12:00	88

### 3.3 Merge trip\_df back to ping\_df to have a common id

Table 7: Merged ping and trips data (solution 2)

	ping_id	driver	ping_time	trip_id	start_time	end_time
1	1	bar	2015-05-27 16:12:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
2	2	bar	2015-05-27 16:31:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
3	3	bar	2015-05-27 16:39:00	1	2015-05-27 16:12:00	2015-05-27 16:39:00
4	3	bar	2015-05-27 16:39:00	2	2015-05-27 16:39:00	2015-05-27 17:29:00
5	4	bar	2015-05-27 16:53:00	2	2015-05-27 16:39:00	2015-05-27 17:29:00
6	5	bar	2015-05-27 17:29:00	2	2015-05-27 16:39:00	2015-05-27 17:29:00
7	5	bar	2015-05-27 17:29:00	3	2015-05-27 17:29:00	2015-05-27 17:41:00
8	6	bar	2015-05-27 17:41:00	3	2015-05-27 17:29:00	2015-05-27 17:41:00
9	6	bar	2015-05-27 17:41:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
10	7	bar	2015-05-27 17:58:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
11	8	bar	2015-05-27 18:09:00	4	2015-05-27 17:41:00	2015-05-27 18:09:00
12	8	bar	2015-05-27 18:09:00	5	2015-05-27 18:09:00	2015-05-27 18:43:00
13	9	bar	2015-05-27 18:23:00	5	2015-05-27 18:09:00	2015-05-27 18:43:00
14	10	bar	2015-05-27 18:43:00	5	2015-05-27 18:09:00	2015-05-27 18:43:00
15	11	foo	2015-05-27 07:11:00	6	2015-05-27 07:11:00	2015-05-27 07:42:00
16	12	foo	2015-05-27 07:25:00	6	2015-05-27 07:11:00	2015-05-27 07:42:00
17	13	foo	2015-05-27 07:35:00	6	2015-05-27 07:11:00	2015-05-27 07:42:00
18	14	foo	2015-05-27 07:42:00	6	2015-05-27 07:11:00	2015-05-27 07:42:00
19	14	foo	2015-05-27 07:42:00	7	2015-05-27 07:42:00	2015-05-27 08:09:00
20	15	foo	2015-05-27 07:53:00	7	2015-05-27 07:42:00	2015-05-27 08:09:00
21	16	foo	2015-05-27 08:09:00	7	2015-05-27 07:42:00	2015-05-27 08:09:00
22	16	foo	2015-05-27 08:09:00	8	2015-05-27 08:09:00	2015-05-27 08:39:00
23	17	foo	2015-05-27 08:23:00	8	2015-05-27 08:09:00	2015-05-27 08:39:00
24	18	foo	2015-05-27 08:39:00	8	2015-05-27 08:09:00	2015-05-27 08:39:00
25	18	foo	2015-05-27 08:39:00	9	2015-05-27 08:39:00	2015-05-27 09:12:00
26	19	foo	2015-05-27 08:52:00	9	2015-05-27 08:39:00	2015-05-27 09:12:00
27	20	foo	2015-05-27 09:12:00	9	2015-05-27 08:39:00	2015-05-27 09:12:00

## 4 Solution 3: Fixed half-hour intervals

### 4.1 Separate ping using flag0

Table 8: Flagged ping data (solution 2)

	driver	ping_time	diff	cum_mins	cum_halfhour	flag0	ping_id
1	bar	2015-05-27 16:12:00	0	0	0	0	1
2	bar	2015-05-27 16:31:00	19	19	0.633	0	2
3	bar	2015-05-27 16:39:00	8	27	0.900	0	3
4	bar	2015-05-27 16:53:00	14	41	1.367	1	4
5	bar	2015-05-27 17:29:00	36	77	2.567	2	5
6	bar	2015-05-27 17:41:00	12	89	2.967	2	6
7	bar	2015-05-27 17:58:00	17	106	3.533	3	7
8	bar	2015-05-27 18:09:00	11	117	3.900	3	8
9	bar	2015-05-27 18:23:00	14	131	4.367	4	9
10	bar	2015-05-27 18:43:00	20	151	5.033	5	10
11	foo	2015-05-27 07:11:00	0	0	0	0	11
12	foo	2015-05-27 07:25:00	14	14	0.467	0	12
13	foo	2015-05-27 07:35:00	10	24	0.800	0	13
14	foo	2015-05-27 07:42:00	7	31	1.033	1	14
15	foo	2015-05-27 07:53:00	11	42	1.400	1	15
16	foo	2015-05-27 08:09:00	16	58	1.933	1	16
17	foo	2015-05-27 08:23:00	14	72	2.400	2	17
18	foo	2015-05-27 08:39:00	16	88	2.933	2	18
19	foo	2015-05-27 08:52:00	13	101	3.367	3	19
20	foo	2015-05-27 09:12:00	20	121	4.033	4	20

### 4.2 construct trips data

Table 9: Constructed trips data (solution 3)

	trip_id	driver	start_time	end_time	cum_mins
1	1	bar	2015-05-27 16:12:00	2015-05-27 16:42:00	0
2	2	bar	2015-05-27 16:42:00	2015-05-27 17:12:00	27
3	3	bar	2015-05-27 17:12:00	2015-05-27 17:42:00	41
4	4	bar	2015-05-27 17:42:00	2015-05-27 18:12:00	89
5	5	bar	2015-05-27 18:12:00	2015-05-27 18:42:00	117
6	6	bar	2015-05-27 18:42:00	2015-05-27 18:43:00	131
7	7	foo	2015-05-27 07:11:00	2015-05-27 07:41:00	0
8	8	foo	2015-05-27 07:41:00	2015-05-27 08:11:00	24
9	9	foo	2015-05-27 08:11:00	2015-05-27 08:41:00	58
10	10	foo	2015-05-27 08:41:00	2015-05-27 09:11:00	88
11	11	foo	2015-05-27 09:11:00	2015-05-27 09:12:00	101

### 4.3 Merge trip\_df back to ping\_df to have a common id

Table 10: Merged ping and trips data (solution 3)

	ping_id	driver	ping_time	trip_id	start_time	end_time
1	1	bar	2015-05-27 16:12:00	1	2015-05-27 16:12:00	2015-05-27 16:42:00
2	2	bar	2015-05-27 16:31:00	1	2015-05-27 16:12:00	2015-05-27 16:42:00
3	3	bar	2015-05-27 16:39:00	1	2015-05-27 16:12:00	2015-05-27 16:42:00
4	4	bar	2015-05-27 16:53:00	2	2015-05-27 16:42:00	2015-05-27 17:12:00
5	5	bar	2015-05-27 17:29:00	3	2015-05-27 17:12:00	2015-05-27 17:42:00
6	6	bar	2015-05-27 17:41:00	3	2015-05-27 17:12:00	2015-05-27 17:42:00
7	7	bar	2015-05-27 17:58:00	4	2015-05-27 17:42:00	2015-05-27 18:12:00
8	8	bar	2015-05-27 18:09:00	4	2015-05-27 17:42:00	2015-05-27 18:12:00
9	9	bar	2015-05-27 18:23:00	5	2015-05-27 18:12:00	2015-05-27 18:42:00
10	10	bar	2015-05-27 18:43:00	6	2015-05-27 18:42:00	2015-05-27 18:43:00
11	11	foo	2015-05-27 07:11:00	7	2015-05-27 07:11:00	2015-05-27 07:41:00
12	12	foo	2015-05-27 07:25:00	7	2015-05-27 07:11:00	2015-05-27 07:41:00
13	13	foo	2015-05-27 07:35:00	7	2015-05-27 07:11:00	2015-05-27 07:41:00
14	14	foo	2015-05-27 07:42:00	8	2015-05-27 07:41:00	2015-05-27 08:11:00
15	15	foo	2015-05-27 07:53:00	8	2015-05-27 07:41:00	2015-05-27 08:11:00
16	16	foo	2015-05-27 08:09:00	8	2015-05-27 07:41:00	2015-05-27 08:11:00
17	17	foo	2015-05-27 08:23:00	9	2015-05-27 08:11:00	2015-05-27 08:41:00
18	18	foo	2015-05-27 08:39:00	9	2015-05-27 08:11:00	2015-05-27 08:41:00
19	19	foo	2015-05-27 08:52:00	10	2015-05-27 08:41:00	2015-05-27 09:11:00
20	20	foo	2015-05-27 09:12:00	11	2015-05-27 09:11:00	2015-05-27 09:12:00