Testing Demonstration

1. Set Up

Credit-Card-Reward-Points-System is a **Spring** project. It runs depending on **Java 8**, **Spring Web Service**, **JPA**, **Thymeleaf**, and **Bootstrap**. Please ensure that the relevant environment is configured before running the program.

The project main function '**CreditCardRewardPointsSystemApplication.java**' is located at **Credit-Card-Reward-Points-System\src\main\java\com\creditcard\rewardpoints**.

Currently the program only accepts **one single month** of a customer's transaction history as input. If more than one month of transaction history is received, the program will raise error message. (I have considered implementing the function to filter input and display output by month, but there is not quite enough time for me to make it comes true)

It is suggested to use the sample csv data provided as the program input. They are located at **Credit-Card-Reward-Points-System\sample_input** folder. However, please feel free to create any input data you want only if it follows the format below:

transactionId	date	merchantCode	amountCents
#	yyyy/MM/dd	XXXX	0000

When the project is running properly locally, please visit http://localhost:8080/reward/ to see the **home page**.

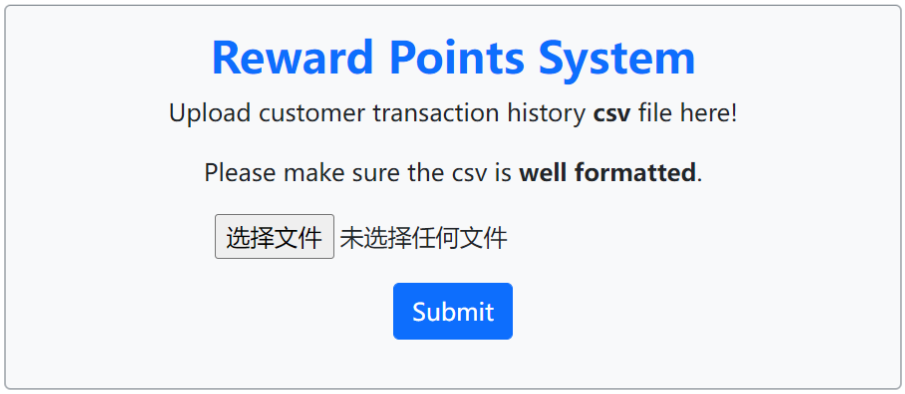
2. Demo Testing

2.1 Get Started

As a easy start, we take transactions_input_1.csv as the first input. It contains data like this:

transactionId	date	merchantCode	amountCents
1	2021/5/1	sportcheck	5000
2	2021/5/2	sportcheck	3000
3	2021/5/3	sportcheck	2000
4	2021/5/4	tim_hortons	2500
5	2021/5/5	subway	500
6	2021/5/6	costco	10000
7	2021/5/7	walmart	1500

Open the home page http://localhost:8080/reward/, we could see:



Using the '**choose file**' button to upload the csv input file. (Choose file button will always display in browser's native language)

After choosing the file properly, click '**submit**' button to move forward to the **Monthly Reward Points Details page**.

Your Monthly Reward Points Details

Month: 2021/5

Total Reward Points: **500**

Reward Contribution

Sports Check: 305.0 Tim Hortons: 75.0 Subway: 5.0 Other: 115.0

Promotion Applied

Rule	Description	No. Applied
2	300 points for every $75 spend at Sport Check and $25 spend at Tim Hortons	**1**
6	75 point for every $20 spend at Sport Check	**1**
7	1 points for every $1 spend for all other purchases (including leftover amount)	**125**

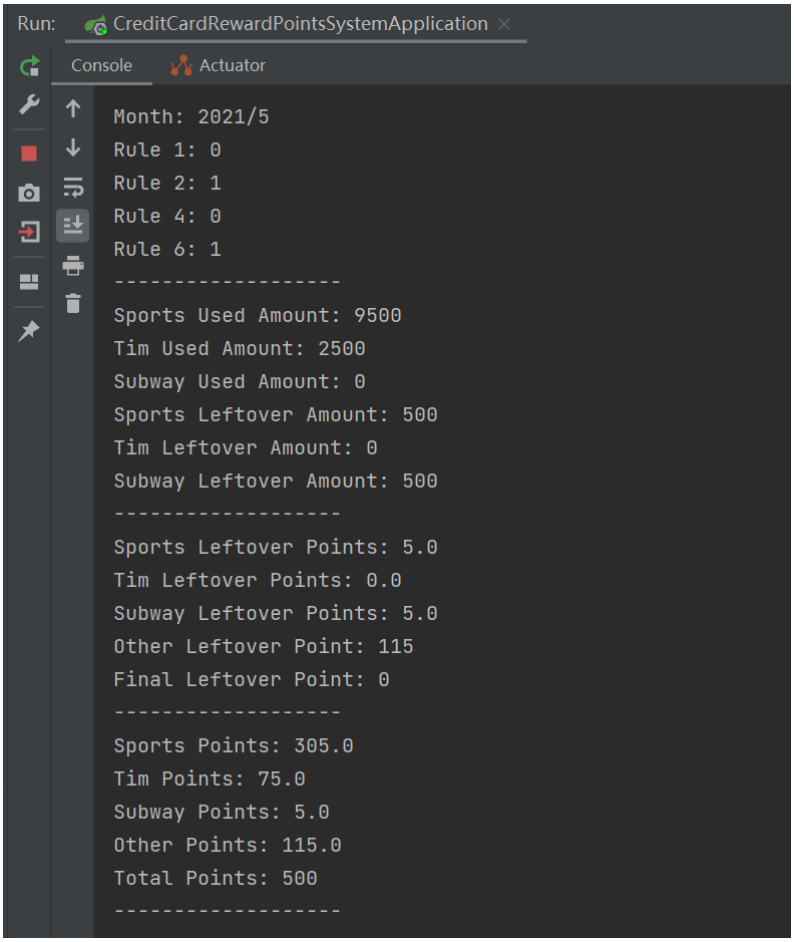
Transaction Details

Transaction ID	Date	Merchant Code	Amount Cents	Reward Points
1	2021/5/1	sportcheck	5000	**152.5**
2	2021/5/2	sportcheck	3000	**91.5**
3	2021/5/3	sportcheck	2000	**61.0**
4	2021/5/4	tim_hortons	2500	**75.0**
5	2021/5/5	subway	500	**5.0**
6	2021/5/6	costco	10000	**100.0**
7	2021/5/7	walmart	1500	**15.0**

The **total maximum rewards points earned** is displayed at the top of the page with **red** font. The
maximum reward points earned for each transaction could also be found in the 'Reward Points' column of the Transaction Details table. Other interesting information is also provided along in the details page.

Note that if certain rules are **not applied** at all (e.g. Rule 1 & 4), they would **not show** in the Promotion Applied table.

You could found some console output in the console terminal as well:



2.2 Standard Input

Now let us test the standard input mentioned in the Question document:

transactions = {
"T01": {"date": "2021-05-01", "merchant_code" : "sportcheck", "amount_cents": 21000},
"T02": {"date": "2021-05-02", "merchant_code" : "sportcheck", "amount_cents": 8700},
"T03": {"date": "2021-05-03", "merchant_code" : "tim_hortons", "amount_cents": 323},
"T04": {"date": "2021-05-04", "merchant_code" : "tim_hortons", "amount_cents": 1267},
"T05": {"date": "2021-05-05", "merchant_code" : "tim_hortons", "amount_cents": 2116},
"T06": {"date": "2021-05-06", "merchant_code" : "tim_hortons", "amount_cents": 2211},
"T07": {"date": "2021-05-07", "merchant_code" : "subway", "amount_cents": 1853},
"T08": {"date": "2021-05-08", "merchant_code" : "subway", "amount_cents": 2153},
"T09": {"date": "2021-05-09", "merchant_code" : "sportcheck", "amount_cents": 7326},
"T10": {"date": "2021-05-10", "merchant_code" : "tim_hortons", "amount_cents": 1321}
}

It looks like this in **transactions_input_2.csv**:

transactionId	date	merchantCode	amountCents
1	2021/5/1	sportcheck	21000
2	2021/5/2	sportcheck	8700
3	2021/5/3	tim_hortons	323
4	2021/5/4	tim_hortons	1267
5	2021/5/5	tim_hortons	2116
6	2021/5/6	tim_hortons	2211
7	2021/5/7	subway	1853
8	2021/5/8	subway	2153
9	2021/5/9	sportcheck	7326
10	2021/5/10	tim_hortons	1321

Follow a process similar to 2.1, we could get the output page:

Your Monthly Reward Points Details

Month: 2021/5

Total Reward Points: **1657**

Reward Contribution

Sports Check: 1298.33 Tim Hortons: 220.33 Subway: 138.33 Other: 0.0

Promotion Applied

Rule	Description	No. Applied
1	500 points for every $75 spend at Sport Check, $25 spend at Tim Hortons and $25 spend at Subway	1
2	300 points for every $75 spend at Sport Check and $25 spend at Tim Hortons	1
4	150 points for every $25 spend at Sport Check, $10 spend at Tim Hortons and $10 spend at Subway	1
6	75 point for every $20 spend at Sport Check	9
7	1 points for every $1 spend for all other purchases (including leftover amount)	32

Transaction Details

Transaction ID	Date	Merchant Code	Amount Cents	Reward Points
1	2021/5/1	sportcheck	21000	736.37
2	2021/5/2	sportcheck	8700	305.07
3	2021/5/3	tim_hortons	323	9.83
4	2021/5/4	tim_hortons	1267	38.57
5	2021/5/5	tim_hortons	2116	64.41
6	2021/5/6	tim_hortons	2211	67.31
7	2021/5/7	subway	1853	63.99
8	2021/5/8	subway	2153	74.35
9	2021/5/9	sportcheck	7326	256.89
10	2021/5/10	tim_hortons	1321	40.21

2.3 Massive Input

A massive input data **transactions_input_3.csv** is designed with 100 transactions and total purchase amount of 379316 cent (=3793 dollar).

```
transactionId,date,merchantCode,amountCents
1,2022/10/16,sportcheck,4960
2,2022/10/16,tim_hortons,1751
3,2022/10/16,subway,950
4,2022/10/16,costco,15368
5,2022/10/16,walmart,10000
6,2022/10/16,sportcheck,8372
```

```
7,2022/10/16,tim_hortons,731
8,2022/10/16,amazon,4870
9,2022/10/16,tim_hortons,508
10,2022/10/16,sportcheck,1979
11,2022/10/16,tim_hortons,1078
12,2022/10/16,subway,1828
13,2022/10/16,tim_hortons,1248
14,2022/10/16,sportcheck,6431
15,2022/10/16,shoppers,2166
16,2022/10/16,tim_hortons,1614
17,2022/10/16,subway,563
18,2022/10/16,sportcheck,5224
19,2022/10/16,sportcheck,3281
20,2022/10/16,amazon,3571
21,2022/10/16,tim_hortons,1666
22,2022/10/16,sportcheck,3801
23,2022/10/16,subway,1651
24,2022/10/16,costco,12364
25,2022/10/16,tim_hortons,1435
26,2022/10/16,sportcheck,4192
27,2022/10/16,sportcheck,6927
28,2022/10/16,walmart,3770
29,2022/10/16,shoppers,1819
30,2022/10/16,sportcheck,5509
31,2022/10/16,tim_hortons,1365
32,2022/10/16,subway,1102
33,2022/10/16,amazon,3321
34,2022/10/16,sportcheck,5520
35,2022/10/16,tim_hortons,1797
36,2022/10/16,subway,975
37,2022/10/17,sportcheck,1970
38,2022/10/17,tim_hortons,1205
39,2022/10/17,tim_hortons,847
40,2022/10/17,shoppers,1563
41,2022/10/17,walmart,502
42,2022/10/17,sportcheck,4702
43,2022/10/17,sportcheck,6117
44,2022/10/17,tim_hortons,1971
45,2022/10/17,subway,1548
46,2022/10/17,sportcheck,6485
47,2022/10/17,shoppers,1354
48,2022/10/17,tim_hortons,1383
49,2022/10/17,sportcheck,5381
50,2022/10/17,tim_hortons,751
51,2022/10/17,subway,1956
52,2022/10/17,tim_hortons,1879
53,2022/10/17,sportcheck,12469
54,2022/10/17,subway,1411
55,2022/10/17,tim_hortons,677
56,2022/10/17,subway,1263
57,2022/10/17,sportcheck,5048
58,2022/10/17,sportcheck,11777
59,2022/10/17,amazon,5198
60,2022/10/17,tim_hortons,479
61,2022/10/17,sportcheck,6862
62,2022/10/17,subway,1867
63,2022/10/17,costco,9403
64,2022/10/17,tim_hortons,971
```

```
65,2022/10/17,tim_hortons,1246
66,2022/10/17,sportcheck,7958
67,2022/10/17,walmart,1971
68,2022/10/17,shoppers,1135
69,2022/10/17,sportcheck,11805
70,2022/10/17,tim_hortons,527
71,2022/10/17,subway,1582
72,2022/10/17,amazon,3983
73,2022/10/17,sportcheck,12709
74,2022/10/17,tim_hortons,971
75,2022/10/17,subway,1632
76,2022/10/17,sportcheck,11621
77,2022/10/17,tim_hortons,481
78,2022/10/17,tim_hortons,1866
79,2022/10/17,shoppers,679
80,2022/10/17,walmart,1632
81,2022/10/17,sportcheck,11871
82,2022/10/17,tim_hortons,1646
83,2022/10/17,tim_hortons,1934
84,2022/10/17,subway,1634
85,2022/10/17,sportcheck,12624
86,2022/10/17,shoppers,2012
87,2022/10/17,tim_hortons,1790
88,2022/10/17,sportcheck,12265
89,2022/10/17,tim_hortons,936
90,2022/10/17,tim_hortons,1358
91,2022/10/17,subway,1925
92,2022/10/17,sportcheck,14210
93,2022/10/17,tim_hortons,1185
94,2022/10/17,tim_hortons,1585
95,2022/10/17,shoppers,1324
96,2022/10/17,walmart,2398
97,2022/10/17,sportcheck,9765
98,2022/10/17,sportcheck,4002
99,2022/10/17,tim_hortons,1105
100,2022/10/17,subway,1203
```

Here is the output we get:

Your Monthly Reward Points Details

Month: 2022/10

Total Reward Points: **11448**

Reward Contribution

Sports Check: 8265.0 Tim Hortons: 1374.0 Subway: 905.0 Other: 904.0

Promotion Applied

Rule	Description	No. Applied
1	500 points for every $75 spend at Sport Check, $25 spend at Tim Hortons and $25 spend at Subway	**9**
2	300 points for every $75 spend at Sport Check and $25 spend at Tim Hortons	**6**
6	75 point for every $20 spend at Sport Check	**56**
7	1 points for every $1 spend for all other purchases (including leftover amount)	**948**

Transaction Details

Transaction ID	Date	Merchant Code	Amount Cents	Reward Points
1	2022/10/16	sportcheck	4960	**181.52**
2	2022/10/16	tim_hortons	1751	**60.17**
3	2022/10/16	subway	950	**37.23**
4	2022/10/16	costco	15368	**153.67**
5	2022/10/16	walmart	10000	**100.0**
6	2022/10/16	sportcheck	8372	**306.39**
7	2022/10/16	tim_hortons	731	**25.12**
8	2022/10/16	amazon	4870	**48.7**
9	2022/10/16	tim_hortons	508	**17.46**
10	2022/10/16	sportcheck	1979	**72.43**
11	2022/10/16	tim_hortons	1078	**37.04**
12	2022/10/16	subway	1828	**71.65**
13	2022/10/16	tim_hortons	1248	**42.88**
14	2022/10/16	sportcheck	6431	**235.36**
15	2022/10/16	shoppers	2166	**21.66**
16	2022/10/16	tim_hortons	1614	**55.46**
17	2022/10/16	subway	563	**22.07**
18	2022/10/16	sportcheck	5224	**191.18**
19	2022/10/16	sportcheck	3281	**120.08**
20	2022/10/16	amazon	3571	**35.71**
21	2022/10/16	tim_hortons	1666	**57.25**
22	2022/10/16	sportcheck	3801	**139.11**
23	2022/10/16	subway	1651	**64.71**
24	2022/10/16	costco	12364	**123.64**
25	2022/10/16	tim_hortons	1435	**49.31**
26	2022/10/16	sportcheck	4192	**153.42**
27	2022/10/16	sportcheck	6927	**253.51**
28	2022/10/16	walmart	3770	**37.7**
29	2022/10/16	shoppers	1819	**18.19**
30	2022/10/16	sportcheck	5509	**201.61**
31	2022/10/16	tim_hortons	1365	**46.9**
32	2022/10/16	subway	1102	**43.19**
33	2022/10/16	amazon	3321	**33.21**
34	2022/10/16	sportcheck	5520	**202.02**
35	2022/10/16	tim_hortons	1797	**61.75**
36	2022/10/16	subway	975	**38.21**
37	2022/10/17	sportcheck	1970	**72.1**
38	2022/10/17	tim_hortons	1205	**41.41**
39	2022/10/17	tim_hortons	847	**29.1**
40	2022/10/17	shoppers	1563	**15.63**
41	2022/10/17	walmart	502	**5.02**
42	2022/10/17	sportcheck	4702	**172.08**
43	2022/10/17	sportcheck	6117	**223.87**
44	2022/10/17	tim_hortons	1971	**67.73**
45	2022/10/17	subway	1548	**60.67**
46	2022/10/17	sportcheck	6485	**237.33**
47	2022/10/17	shoppers	1354	**13.54**

48	2022/10/17	tim_hortons	1383	**47.52**
49	2022/10/17	sportcheck	5381	**196.93**
50	2022/10/17	tim_hortons	751	**25.81**
51	2022/10/17	subway	1956	**76.66**
52	2022/10/17	tim_hortons	1879	**64.57**
53	2022/10/17	sportcheck	12469	**456.33**
54	2022/10/17	subway	1411	**55.3**
55	2022/10/17	tim_hortons	677	**23.26**
56	2022/10/17	subway	1263	**49.5**
57	2022/10/17	sportcheck	5048	**184.74**
58	2022/10/17	sportcheck	11777	**431.01**
59	2022/10/17	amazon	5198	**51.98**
60	2022/10/17	tim_hortons	479	**16.46**
61	2022/10/17	sportcheck	6862	**251.13**
62	2022/10/17	subway	1867	**73.18**
63	2022/10/17	costco	9403	**94.03**
64	2022/10/17	tim_hortons	971	**33.37**
65	2022/10/17	tim_hortons	1246	**42.82**
66	2022/10/17	sportcheck	7958	**291.24**
67	2022/10/17	walmart	1971	**19.71**
68	2022/10/17	shoppers	1135	**11.35**
69	2022/10/17	sportcheck	11805	**432.03**
70	2022/10/17	tim_hortons	527	**18.11**
71	2022/10/17	subway	1582	**62.01**
72	2022/10/17	amazon	3983	**39.83**
73	2022/10/17	sportcheck	12709	**465.11**
74	2022/10/17	tim_hortons	971	**33.37**
75	2022/10/17	subway	1632	**63.97**
76	2022/10/17	sportcheck	11621	**425.3**
77	2022/10/17	tim_hortons	481	**16.53**
78	2022/10/17	tim_hortons	1866	**64.12**

79	2022/10/17	shoppers	679	**6.79**
80	2022/10/17	walmart	1632	**16.32**
81	2022/10/17	sportcheck	11871	**434.45**
82	2022/10/17	tim_hortons	1646	**56.56**
83	2022/10/17	tim_hortons	1934	**66.46**
84	2022/10/17	subway	1634	**64.04**
85	2022/10/17	sportcheck	12624	**462.0**
86	2022/10/17	shoppers	2012	**20.12**
87	2022/10/17	tim_hortons	1790	**61.51**
88	2022/10/17	sportcheck	12265	**448.86**
89	2022/10/17	tim_hortons	936	**32.16**
90	2022/10/17	tim_hortons	1358	**46.66**
91	2022/10/17	subway	1925	**75.45**
92	2022/10/17	sportcheck	14210	**520.05**
93	2022/10/17	tim_hortons	1185	**40.72**
94	2022/10/17	tim_hortons	1585	**54.46**
95	2022/10/17	shoppers	1324	**13.24**
96	2022/10/17	walmart	2398	**23.98**
97	2022/10/17	sportcheck	9765	**357.37**
98	2022/10/17	sportcheck	4002	**146.46**
99	2022/10/17	tim_hortons	1105	**37.97**
100	2022/10/17	subway	1203	**47.15**