1. How many active monetizers were there on 2017-11-16? How many of those monetizers monetized between 2017-11-17 and 2017-11-23?

The Total Active Members on 16th Nov 2017 were 6512. And those who Monitize on that particular day is shown in table below.

AMOUNT_SPENT_USD	(Multiple Items)	
Sum of AMOUNT_SPENT_USD	**Column Labels**	
Row Labels	**11/16/2017 0:00**	**Grand Total**
71795	1.99	1.99
80525	19.98	19.98
126902	14.99	14.99
193268	24.99	24.99
235919	1.99	1.99
236963	12.99	12.99
258536	25.98	25.98
292868	12.99	12.99
312083	139.98	139.98
319742	1.99	1.99
362378	1.99	1.99
400280	12.99	12.99
402971	7.99	7.99
429833	14.99	14.99
462446	59.99	59.99
464750	5.97	5.97
466988	1.99	1.99
469136	3.98	3.98
471101	31.93	31.93
480965	7.99	7.99
484439	14.99	14.99
484868	14.99	14.99
Grand Total	**437.66**	**437.66**

And, Among those Monetizer who also monetized between 17th Nov to 23 Nov is shown in figure Below.

Jagesh Maharjan; https://github.com/jageshmaharjan; jageshmaharjan@hotmail.com; +86-13480928610

AMOUNT_SPENT_USD	(Multiple Items)								

Sum of AMOUNT_SPENT_USD	Column Labels								
Row Labels	11/16/2017 0:00	11/17/2017 0:00	11/18/2017 0:00	11/19/2017 0:00	11/20/2017 0:00	11/21/2017 0:00	11/22/2017 0:00	11/23/2017 0:00	Grand Total
71795	1.99		11.97						13.96
80525	19.98		1.99		24.98			24.98	71.93
126902	14.99	37.98	24.99	59.99			69.99		207.94
193268	24.99		59.99						84.98
235919	1.99								1.99
236963	12.99	4.99		7.99	14.99	24.99			65.95
258536	25.98	12.99	25.98	12.99	38.97	38.97	25.98	38.97	220.83
292868	12.99					12.99		12.99	38.97
312083	139.98						69.99		209.97
319742	1.99								1.99
362378	1.99	1.99			1.99				5.97
400280	12.99	49.98	22.98						85.95
402971	7.99								7.99
429833	14.99	6.98	24.97	24.99					71.93
462446	59.99		99.99						159.98
464750	5.97	13.93	5.97	11.97	11.94	5.97	5.97	5.97	67.69
466988	1.99								1.99
469136	3.98					1.99			5.97
471101	31.93			21.95	7.99				61.87
480965	7.99					4.99	7.99		20.97
484439	14.99								14.99
484868	14.99								14.99
Grand Total	437.66	128.84	278.83	139.88	100.86	89.9	179.92	82.91	1438.8
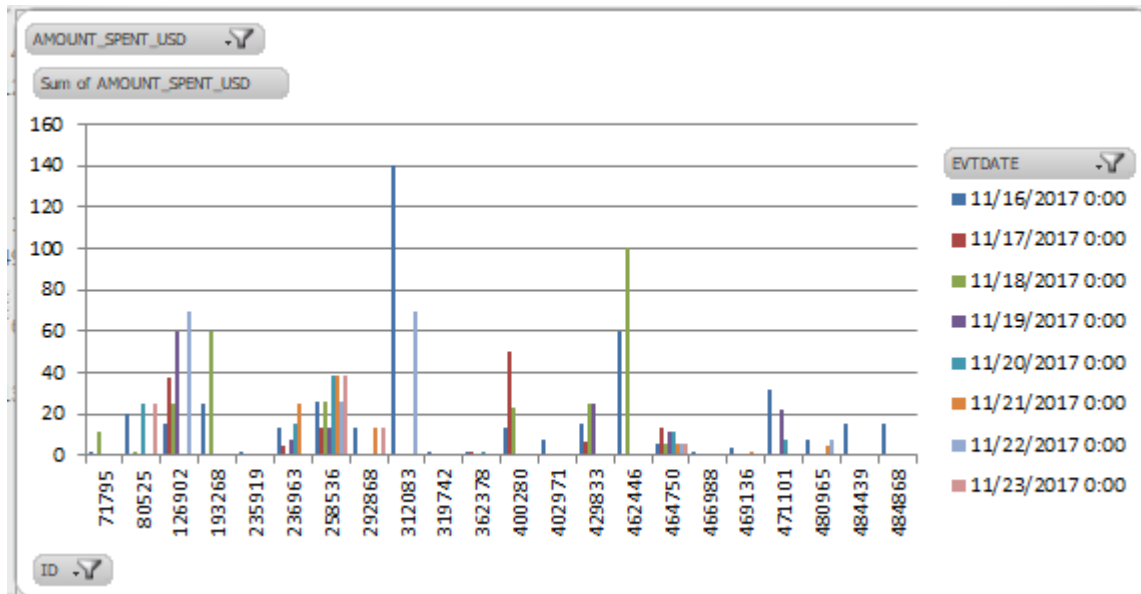
2. Between 2017-12-09 and 2017-12-19, an A/B test was conducted to test players' game preferences by making changes to certain game features of B group players.

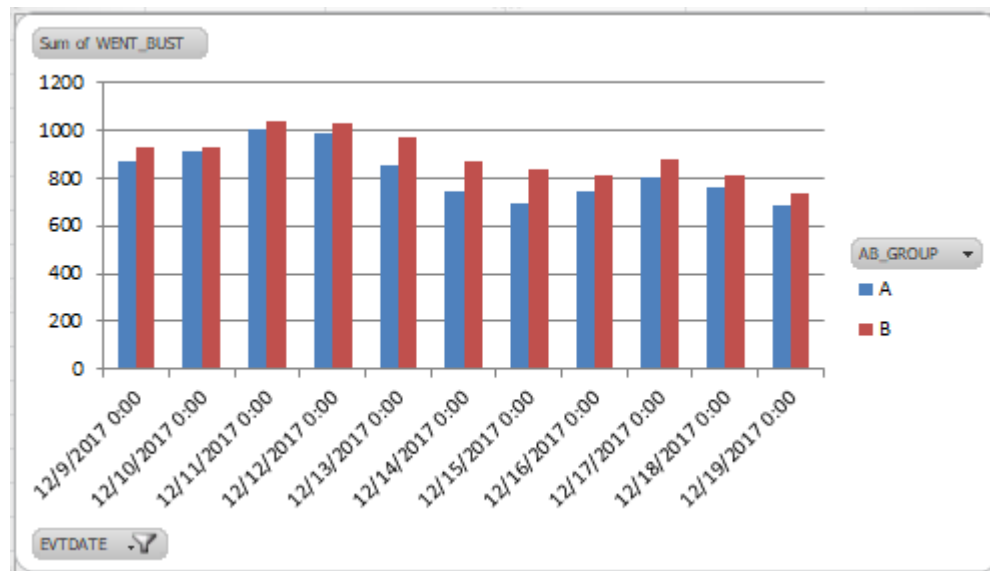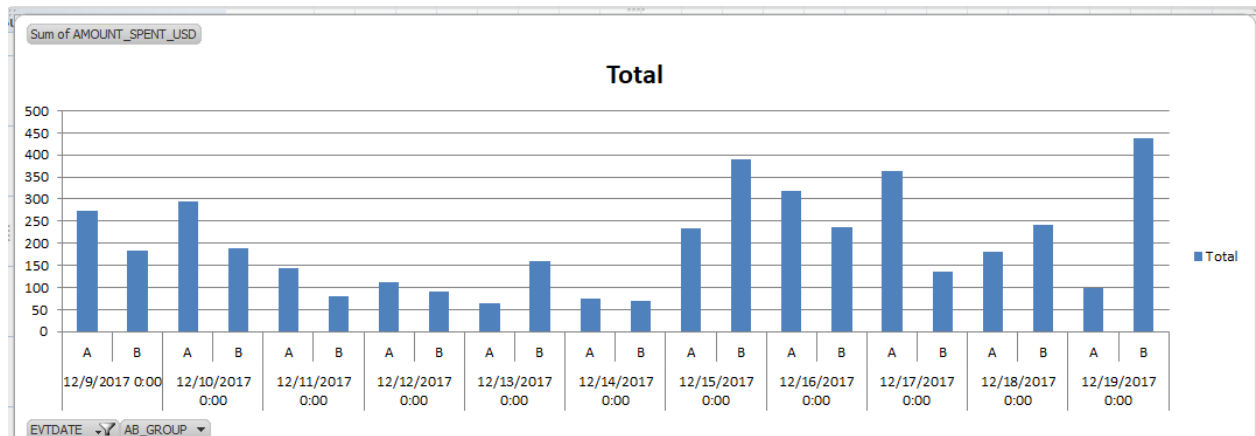   a. Evaluate the comparative performance of these two groups.

    b. Which performance do you think is favourable?

The below Figure shows the A/B test between the Date range 2017/12/09 to 2017/12/19.
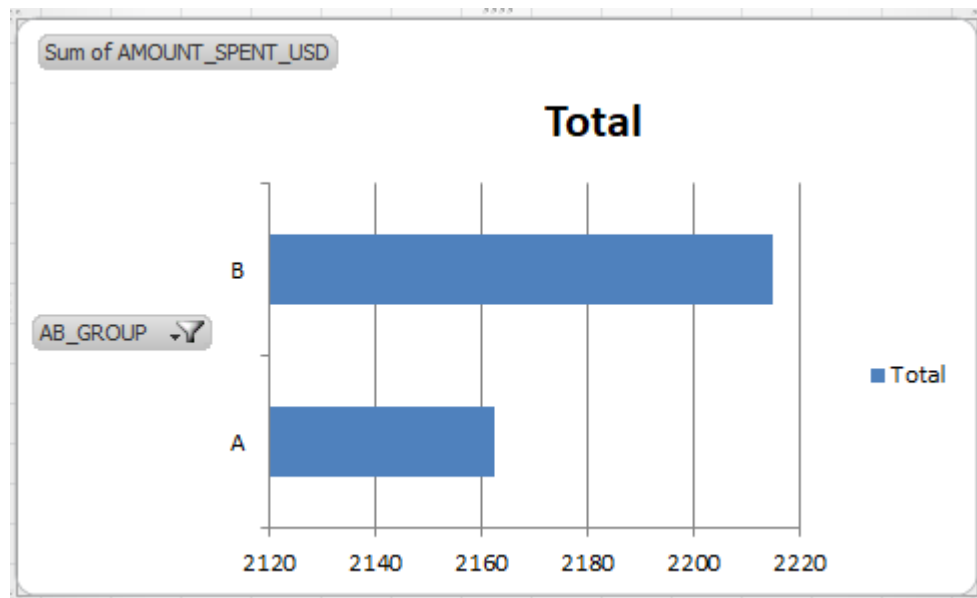
Jagesh Maharjan; https://github.com/jageshmaharjan; jageshmaharjan@hotmail.com; +86-13480928610

By Analysing the AB test in a given date range, In average test A have more chance of spending, However, in total for the given date range the Amount Spend for test B is and time spend in playing test B is longer than that of Test A.

In general I would suggest test A is favorable than Test B.

3. On 2018-01-15, a new game feature was released.

   a. Discuss the impact of this features on user behaviour, using a variety of metrics.

   b. Suggest features you think may have been implemented to cause this change in behaviour.

   c. If you could have more data to support your evaluation of the new features, what data would you like to have and why?
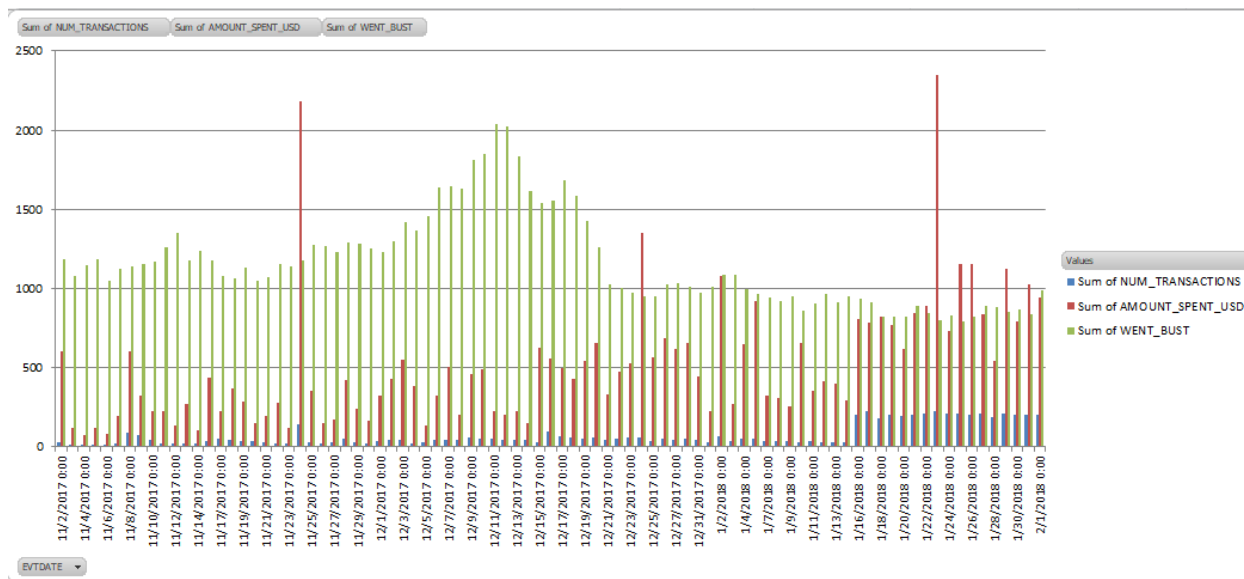
With the given analysis after the new feature were release on 15th Jan, 2018. Following figures were noticed. The number of transactions increased as much as double as compared to the before 15th Jan, 2018. While the number of Bust went decreased by some. Also the Amount spend relatively increased in average.

If the time Data were to be available, It would have been better to analysis the uses behavior based on time of a Day.

4. The live game team would like to provide a more personalised experience to its users, and would like to group users based on their in-game behaviour.

   a. Use any clustering method to segment users in a meaningful way that could be used to personalise experiences.

   b. Write a brief description characterising a 'typical' member of each cluster.

K-means clustering Algorithm is implemented and source code is available in the Github repo. And Each Cluster is separated in each file.

Jagesh Maharjan; https://github.com/jageshmaharjan; jageshmaharjan@hotmail.com; +86-13480928610