

INVESTMENT ASSIGNMENT

SUBMISSION

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Abstract

- Spark Funds is a Asset Management Company
- CEO of Spark Funds wants to understand the global trends in investments to take the effective investments decisions
- Spark Funds has two minor constraints for investments:
 - It wants to invest between 5 to 15 million USD per round of investment
 - It wants to invest only in English-speaking countries

Business objective:

The objective is to identify the best sectors, countries, and a suitable investment type for making investments. The overall strategy is to invest where others are investing, implying that the 'best' sectors and countries are the ones 'where most investors are investing'.

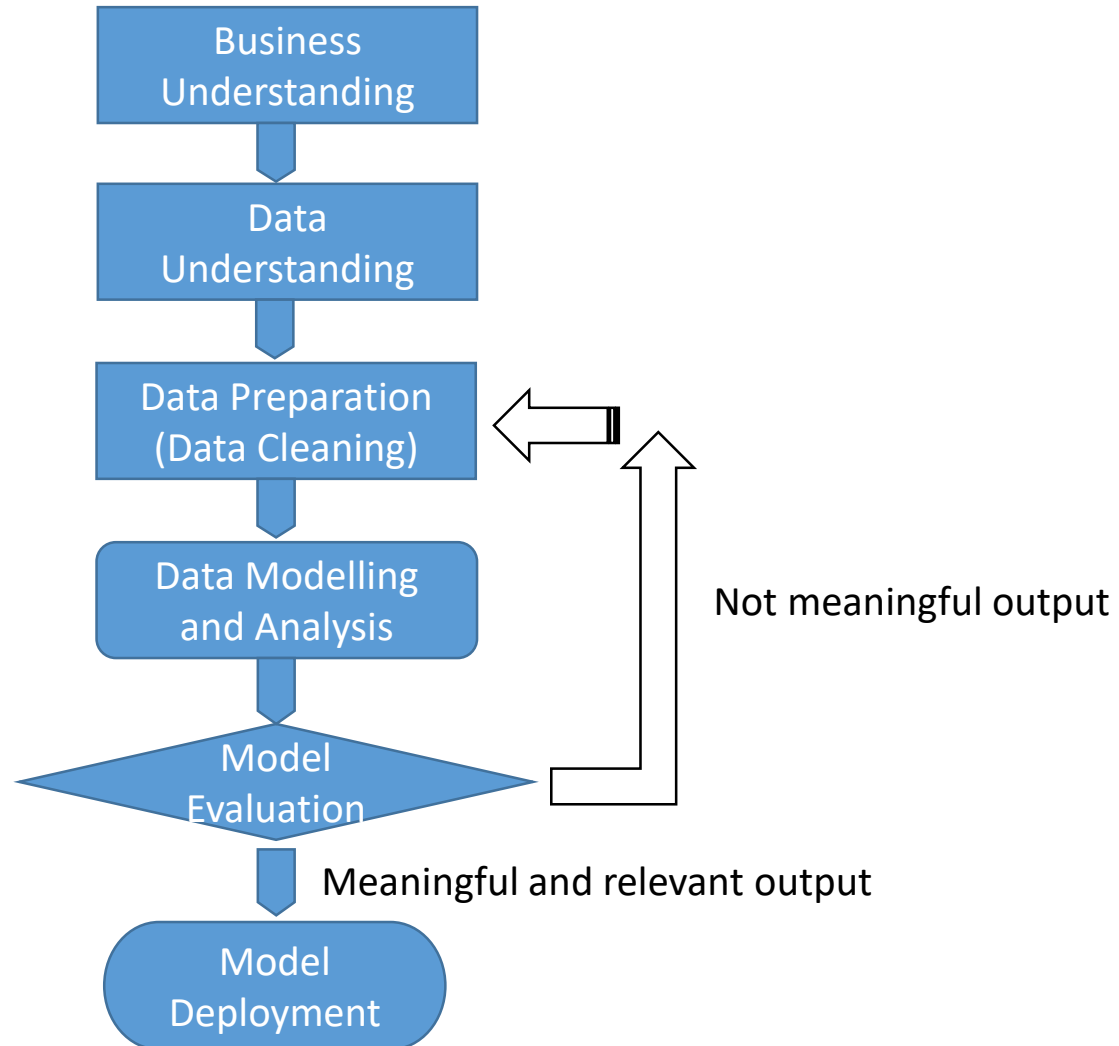
Keeping business objectives in mind, following are the three main goals of a data analyst –

Investment type analysis: To compare the typical investment amounts in the venture, seed, angel, private equity etc. and finally to select the best suited fund for the company.

Country analysis: Identifying the countries which have been the most heavily invested in the past.

Sector analysis: Understanding the distribution of investments across the eight main sectors.

Problem solving methodology



CRISP Method has been followed

Fund or Investment type of Analysis

Using two input files, 'Companies.txt' and 'rounds2.csv' and after necessary data cleanings, 1st created a master frame. With this master frame, after finding mean and median values for all fund types, the values are shown in this table here. As given input Spark Funds want to choose among the four types of funds namely, Seed, Angle, Venture and Private Equity; also considering investment limits of 5 to 15 million USD, here **Venture fund is most suitable type of fund for the company**. Here median values are more meaningful as these are more representative of the sample.

Fund Type	Mean value in Million USD	Median value in Million USD
Post_ipo_debt	168.70	19.95
Post_ipo_equity	82.18	12.26
Secondary_market	79.65	32.6
Private_equity	73.31	20.0
Undisclosed	19.24	1.02
Debt_financing	17.04	1.1
Venture	11.75	5.0
Grant	4.30	0.202
Convertible_note	1.45	0.272
Product_crowdfunding	1.36	0.184
Angel	0.96	0.4
Seed	0.72	0.275
Equity_crowdfunding	0.54	0.1
Non_equity_assistance	0.41	0.06

After identifying most suitable fund as Venture fund, narrowed down the master frame with this fund and Top 9 countries which have received highest total funding are shown in Table-1:

Country code	Raised amount in Million USD
USA	422510.84
CHN	39835.42
GBR	20245.63
IND	14391.86
CAN	9583.33
FRA	7259.54
ISR	6907.51
DEU	6346.96
JPN	3363.68
<u>Table -1</u>	

Next, using Wikipedia link for the countries where English is one of the official languages; among the top 9 countries, the top three English speaking countries are shown in Table-2:

Country code	Raised amount in Million USD
USA	422510.84
GBR	20245.63
IND	14391.86
<u>Table -2</u>	

Sector Analysis

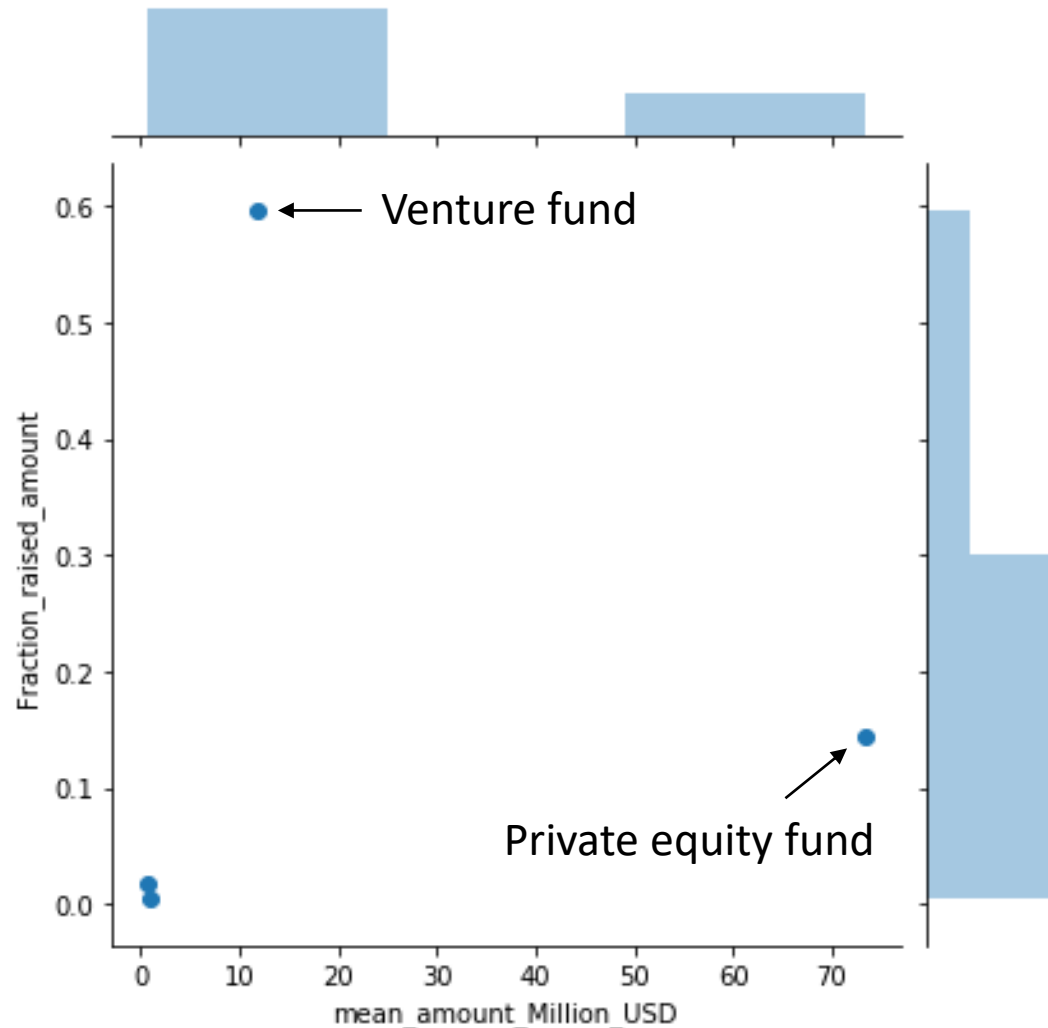
It consists of two parts:

1. Sector analysis-1: Here basically using master frame, two additional columns have been added into it. One column for the primary sector and another for main sector. Primary sector name taken from the 1st string before the vertical bar in category list column. Mapping.csv file was used to add main sector in a separate column for each primary sector. Code for this has been mentioned in the Jupyter file.
2. Sector analysis-2: Here for top three English speaking countries (USA, GBR and IND) and for funding range between 5 to 15 million USD; three data-frames D1, D2 and D3 have been created. In each of these data-frames, primary sector along with its main sectors, total number and total amount of investments for each main sector have been mentioned. Code for the same have been provided in the Jupyter file.

Sector-wise Investment Analysis				
Sl.no	Questions	C1 (for USA)	C2 (for GBR)	C3 (for IND)
1	Total number of Investments (count)	9227	524	222
2	Total amount of investment (USD)	82391.52 Million	4593.71 Million	1998.53 Million
3	Top Sector name (no. of investment-wise)	Others	Others	Others
4	Second Sector name (no. of investment-wise)	Cleantech/Semiconductors	Cleantech/Semiconductors	News, Search and Messaging
5	Third Sector name (no. of investment-wise)	Social, Finance, Analytics, Advertising	Social, Finance, Analytics, Advertising	Social, Finance, Analytics, Advertising
6	Number of investments in top sector (3)	2400	126	77
7	Number of investments in second sector (4)	1950	123	41
8	Number of investments in third sector (5)	1550	89	25
9	For point 3 (top sector count-wise), which company received the highest investment?	SOFTWARE	SOFTWARE	E-COMMERCE
10	For point 4 (second best sector count-wise), which company received the highest investment?	BIOTECHNOLOGY	BIOTECHNOLOGY	MOBILE

USA is having highest number and amount of investments. Top three sectors are 'Others', 'Cleantech/Semiconductors' and 'Social, Finance, Analytics, Advertising'. 'Software' and 'Biotechnology' are the two companies from these sectors where count-wise top and second best investments happened.

Plot 1: Fraction of total investments in angel, venture, seed and private equity; and the average amount of investment in each funding type shown here with joint plot -

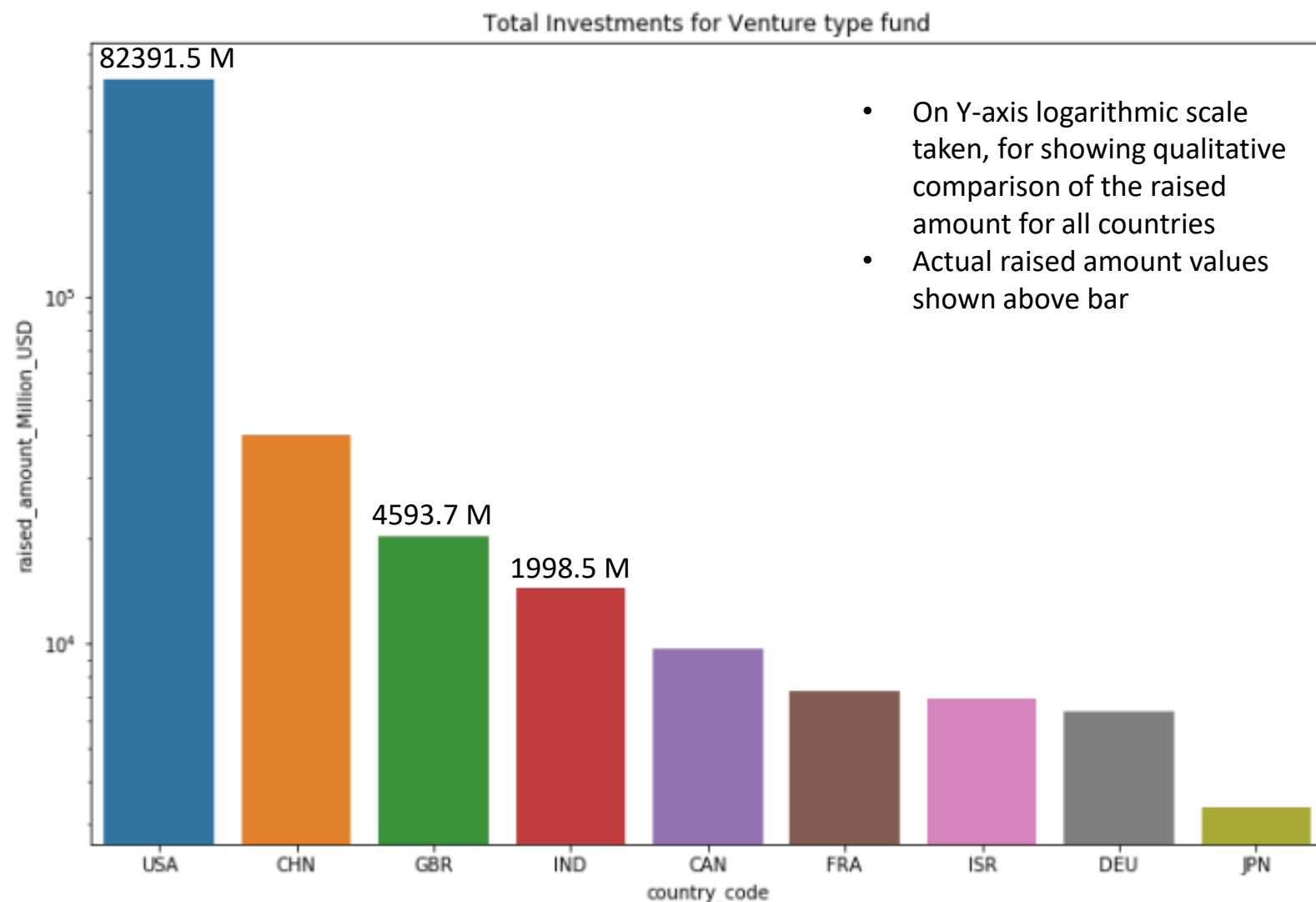


Followings are the main observations from this plot:

- Venture fund mean value is between 5 to 15 millions
- Private equity fund mean value (70 million usd) is much above than the 15 million limit
- Remaining two funds mean values are below 5 million
- Venture fund having the highest fraction among all four
- **Finally, venture fund is most suitable fund type for Spark Funds**

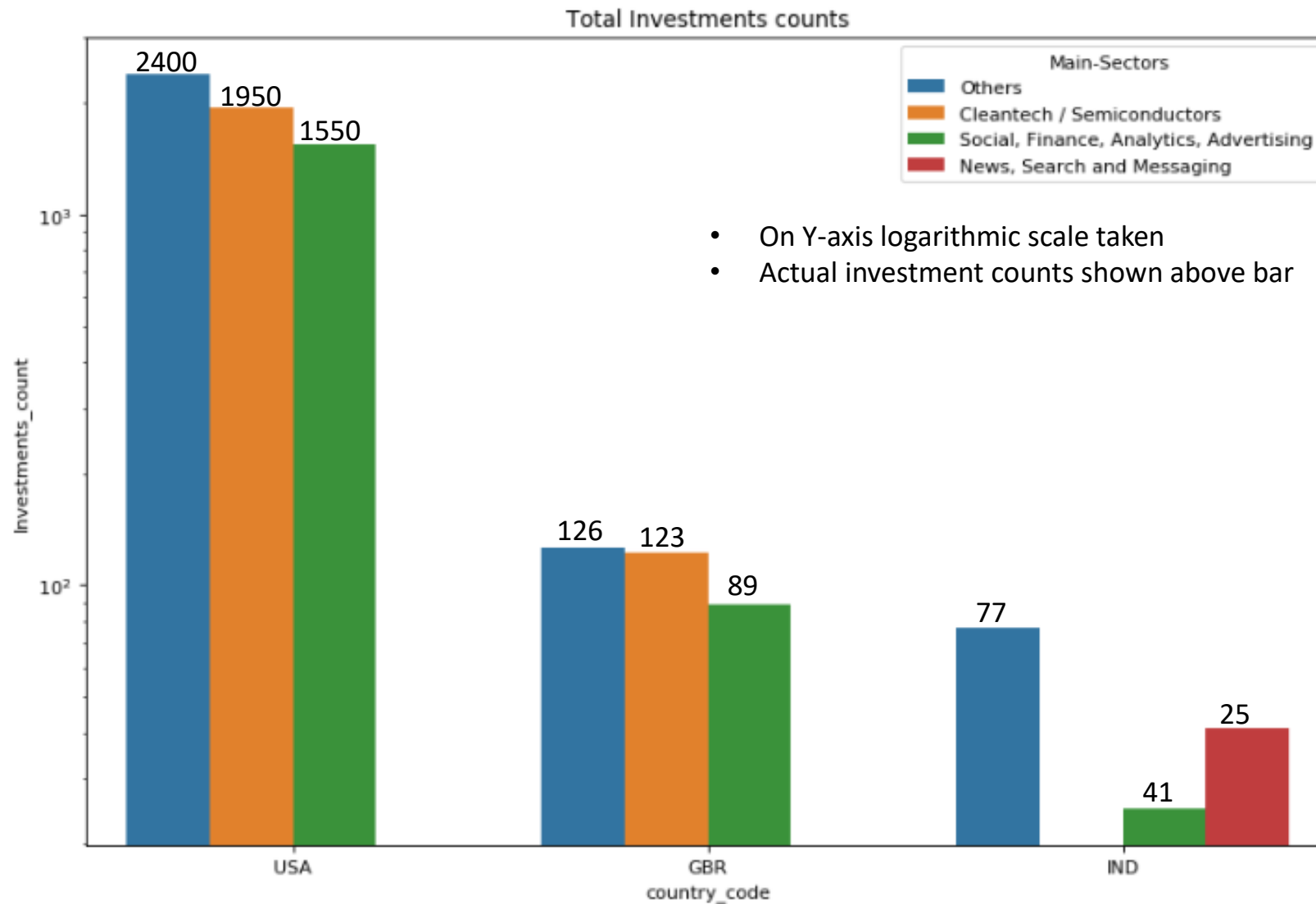
Results continued..

Plot 2: A plot showing the top 9 countries against the total amount of investments of funding type FT –



China is not an English spoken country, so dropping it gives **USA, GBR and IND** as 3 top English spoken countries where raised amounts are highest.

Plot 3: A plot showing the number of investments in the **top 3 sectors** of the **top 3 countries**



Main sectors are same for both USA and GBR. Number of investments in USA is much higher than in GBR. In India investment type and its number of are slightly different and lowest among the three countries.

Conclusions

- Venture type of fund is the best fund among Venture, Seed, angel and private equity in 5 million to 15 million range.
- USA, GBR and IND are the top three English spoken countries where highest investments are there for venture fund.
- For USA and GBR top three sectors are 'Others', 'Cleantech/Semiconductors' and 'Social, Finance, Analytics, Advertising', whereas for IND these sectors are 'Others', 'News, Search and Messaging' and 'Social, Finance, Analytics, Advertising'.