INVESTMENT ASSIGNMENT SUBMISSION

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SparkFunds Business Objective

- Understanding the global trends in Investments for making investments in a few companies.
- To make an investment where most investers are investing by identifying the best sectors, countries and suitable investment type.
- Key Constraints for making investments:
  - To invest between 5 to 15 million USD per round of investment
  - Investment in English speaking countries for ease of communication.

How to solve small analytical milestones and reach to the expected result after analysis ?

- A **flow chart** showing a blend of technical approach and concepts of analysis for achieving SparkFunds Objectives.

- The flow chart is sectioned in to 2 parts.

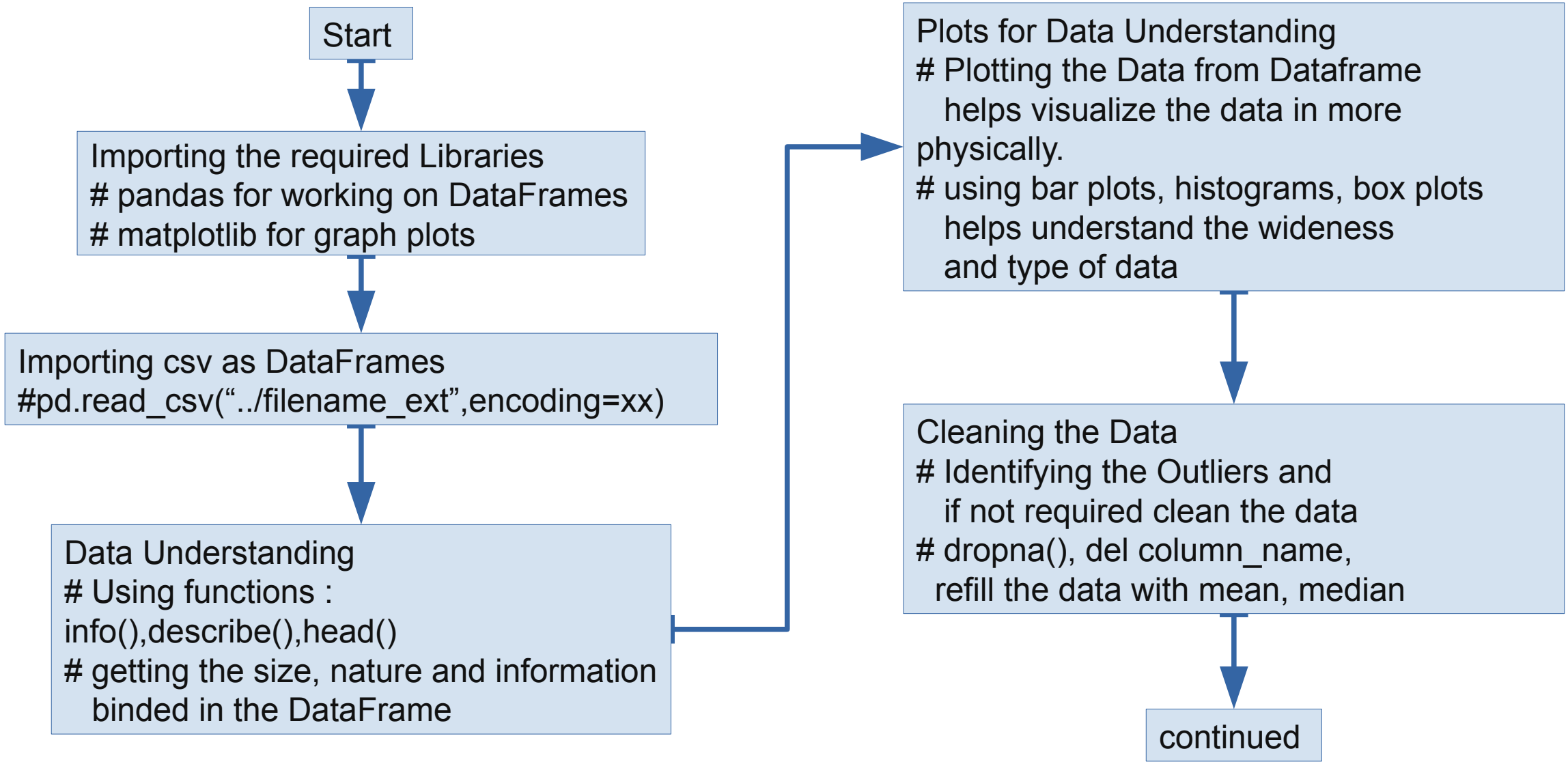
. Flow Chart part-1

- Importing required libraries for working
- Data Collection
- Data understanding
- Data visualisation
- Cleaning the data

. Flow Chart part-2

- Merging the Dataframes as per requirement
- Cleaning the dataframes
- Creating a master frame
- Goal-wise analysis
  - Investment type analysis
  - Country analysis
  - Sector analysis

Flow chart part-1



Flow chart part-2

continued

Merging the DataFrames
Identifying the primary key / unique id from the set for merging

merging the imported csv to dataframes and clubbing it to mainframe
pd.merge(df1,df2,how= ‘ ‘,on=’ ‘)

Data Understanding
# Using functions :
info(),describe(),head()
# getting the size, nature and information binded in the DataFrame

Plots for Data Understanding
Plotting the Data from Dataframe helps visualize the data in more physically.
using bar plots, histograms, box plots helps understand the wideness and type of data

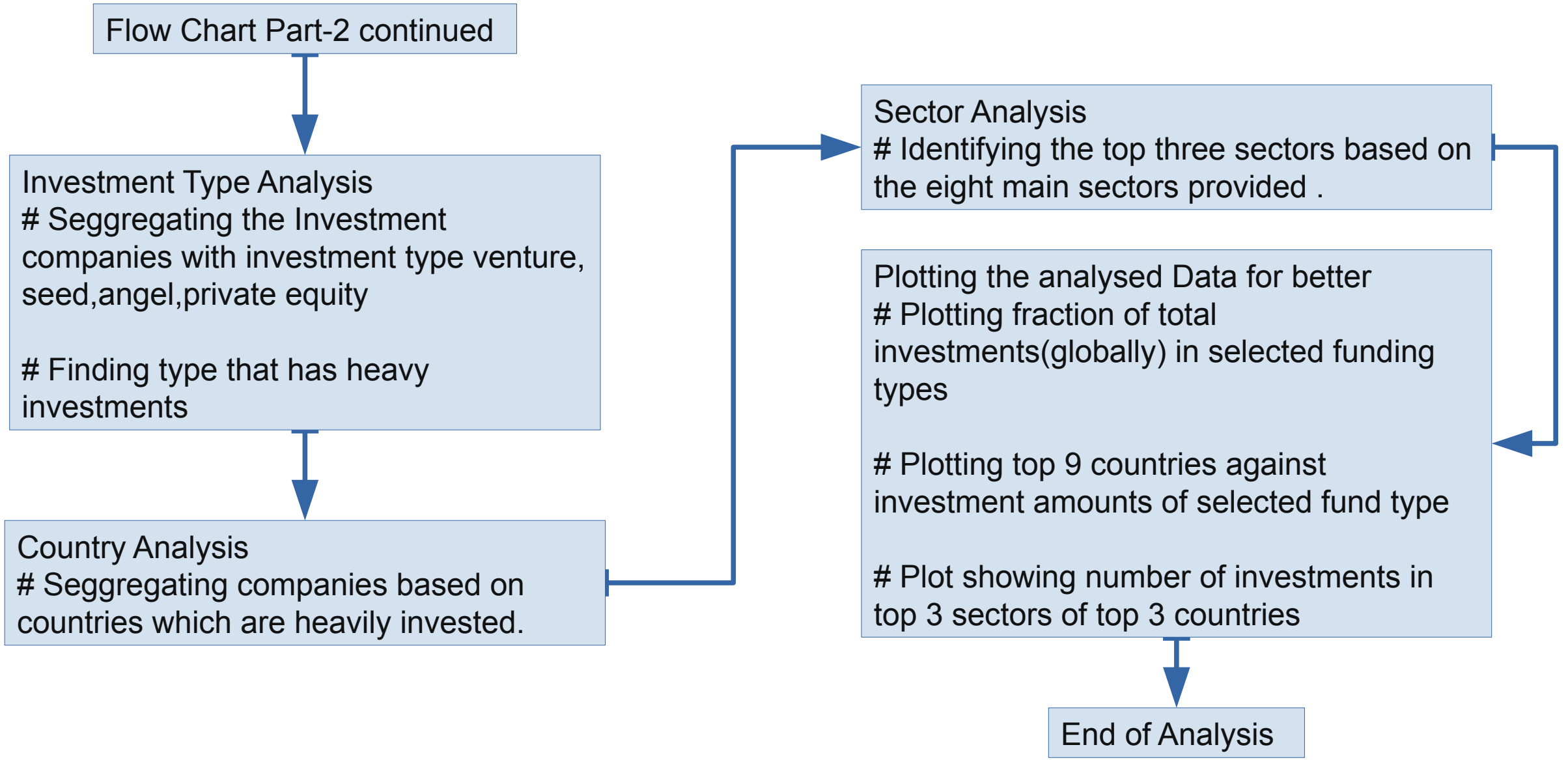
Cleaning the Data
Identifying the Outliers and if not required clean the data

dropna(), del column_name, refill the data with mean, median

Creating Master Frames for further goal oriented analysis

Flow Chart Part-2 continued

Flow chart part-2 (continued)



Investment type analysis

- Among the dataframe of companies obtained by merging and mapping the sectors we need to find the most representative value of the investment types.
- Here the funding types Venture, Angel, Seed and Private Equity is more prefered.
- Grouping the compnies based on funding types and summing the investment amount and the variation of data by calculating the average. And filtering with condition of investment amount 5-15 million USD.
- Further by sorting the values of investment amount in ascending we get a list of top to bottom investment type.
- From this we can easily select the likely funding type by most of the investors.

Investment type analysis

- We get the following Data :
  - From the below data observing the inrange column which says True based on all the filtering conditions by SparkFunds.
  - Venture is the investment funding type likely globally.

Out[11]:

funding_round_type	sum	mean	inrange
venture	5.901262e+11	1.174895e+07	True
angel	4.659255e+09	9.586945e+05	False
seed	1.698824e+10	7.197796e+05	False
private_equity	1.419254e+11	7.330859e+07	False

Country analysis

- Determining the countries of the given invested companies requires two different tasks to be performed.
- Identifying and sorting the countries that speak English language (Countries having English as primary and official language).
- And further filtering with condition of investment amount 5-15 million USD.
- Now by arranging the list of countries in higher to lower order based on the raised amount invested in each countries, we get a list of top 9 countries.

Country analysis

- We get the following Data :
  - From the below data observing the column raised_amount_usd
  - Top 3 countries comes out to be : USA , Great Britain, India

Out[13]:

country_code	raised_amount_usd
USA	4.225108e+11
GBR	2.024563e+10
IND	1.439186e+10
CAN	9.583332e+09
ISR	6.907515e+09
SGP	2.793918e+09
IRL	1.676131e+09
AUS	1.322935e+09
MYS	8.830588e+08

Sector analysis

- Sector anaysis is very important as it helps SparkFunds to invest in which sector among the top countries.
- Also it lists out companies which boom in the perticular sector in perticular selected county.
- Helps narrow down the options from a big pool of companies, countriesa and sectors.
- This can be achieved by mapping the sub-categories sector of the companies provided with the eight main categories given by SparkFunds as their investment interests.

Sector analysis

- After Sector analysis we get:
  - A list of top 3 sectors from top 3 countries

In [23]:

```
# Creating list of Top-3 sectors for each country
sectors_D1 = list(D_ca1.head(3).index) #USA
sectors_D2 = list(D_ca2.head(3).index) #GBR
sectors_D3 = list(D_ca3.head(3).index) #IND

list([sectors_D1,sectors_D2,sectors_D3])
```

Out[23]:

```
[['Others', 'Cleantech / Semiconductors', 'Health'],
 ['Cleantech / Semiconductors', 'Others', 'News, Search and Messaging'],
 ['Others', 'News, Search and Messaging', 'Entertainment']]
```

Sector analysis

- After Sector analysis we get:
  - Also we can further determine the top 3 companies of these respective sectors in respective countries.
  - Output format :
    | Companies(USA)
    | Companies(GBR)
    | Companies (IND)

In [38]:

Slide Type

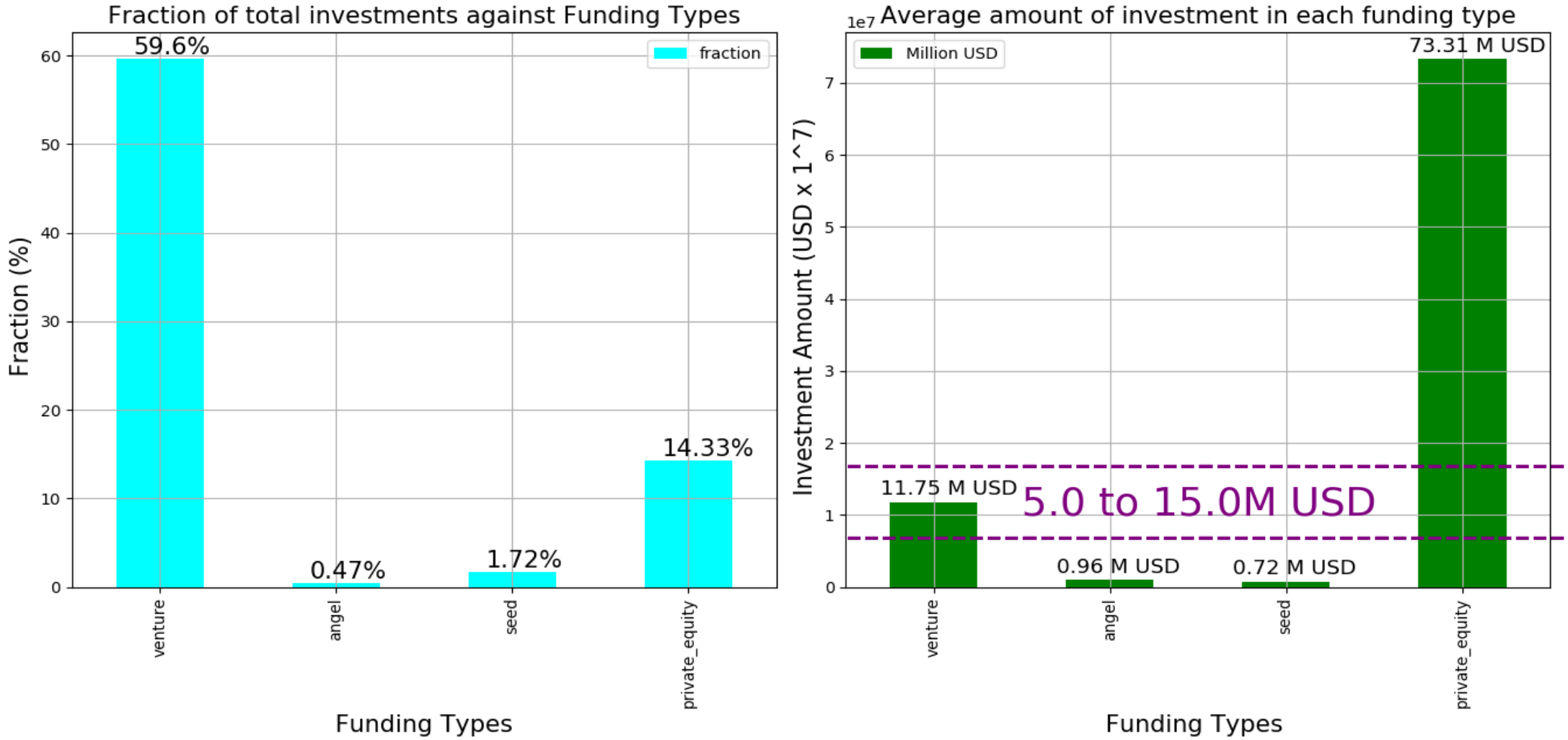
```
companies = list([D1_Table_5_df.index,D2_Table_5_df.index,D3_Table_5_df.index])
companies
```

Out[38]:

```
[Index(['Virtustream', 'Tigo Energy', 'EndoGastric Solutions'], dtype='object', name='name'),
 Index(['EUSA Pharma', 'Electric Cloud', 'Ubiquisys'], dtype='object', name='name'),
 Index(['FirstCry.com', 'GupShup', 'Yatra'], dtype='object', name='name')]
```

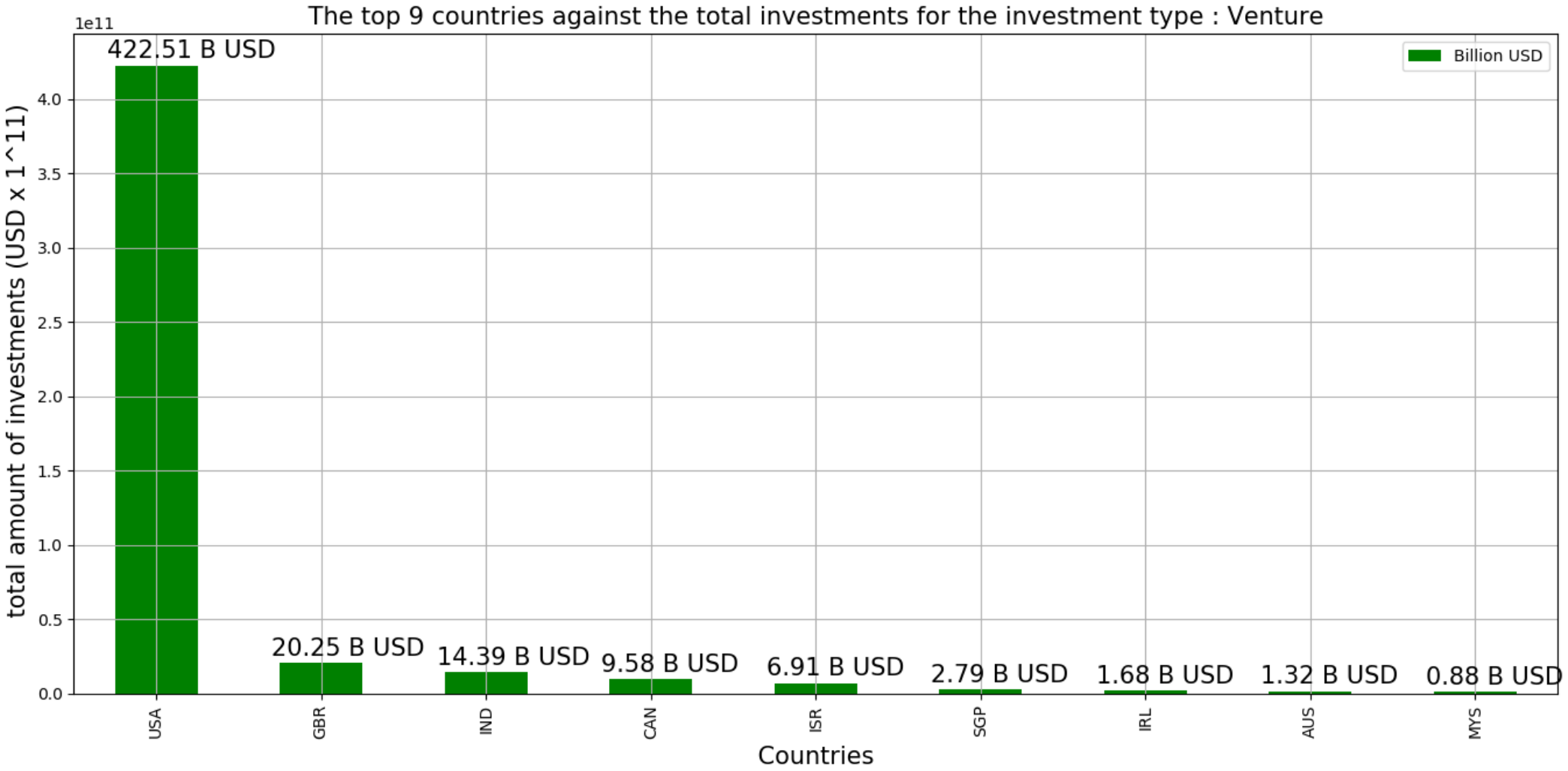
The Fraction of total investments (globally) in Angel, Venture, Seed and Private Equity, and the average of investment in each funding type.

Plot 1



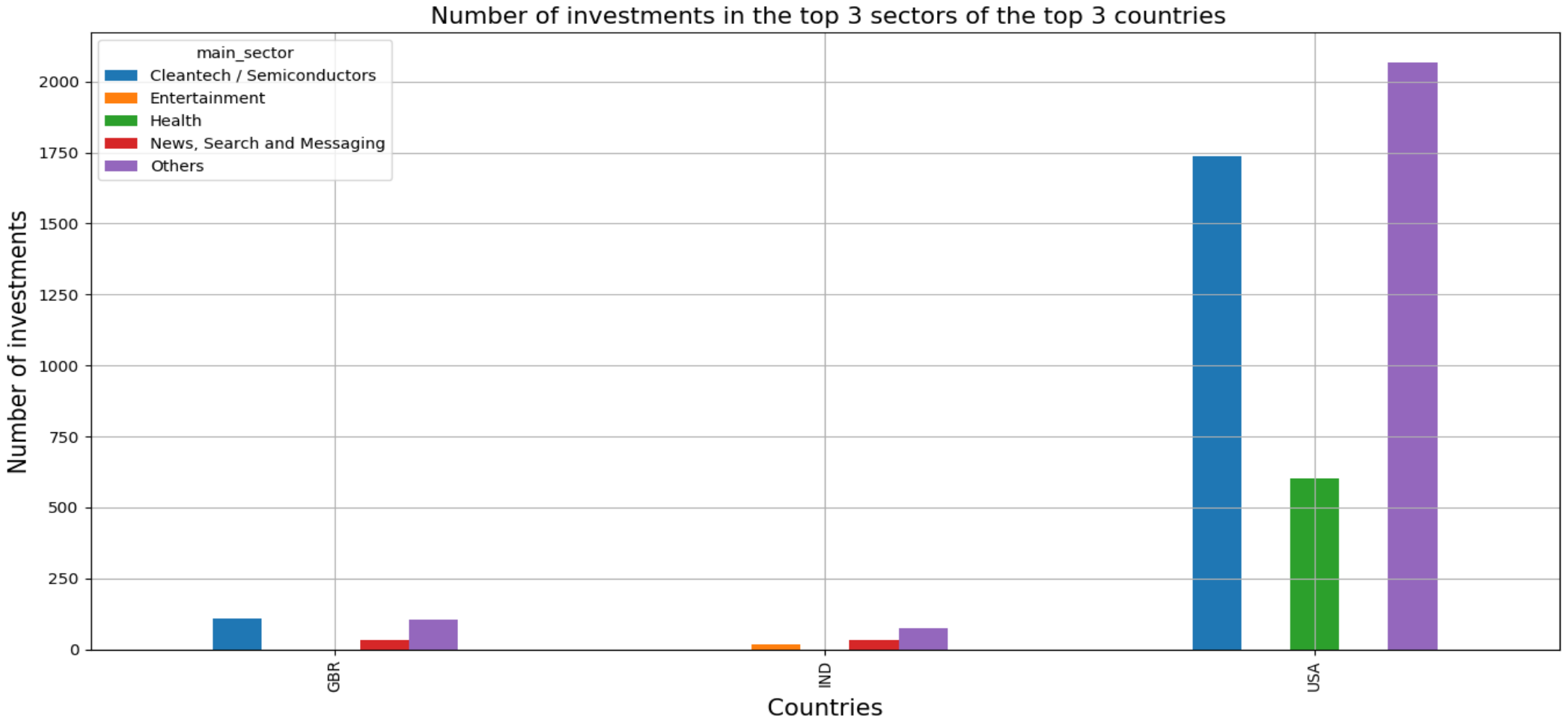
The top 9 countries against the total investments for the investment type : Venture

Plot 2



The number of investments in the top 3 sectors of the top 3 countries for the investment type : Venture

Plot 3



Proposed Conclusions

- With the analysis done on the historical data of the investments provided and with the SparkFunds constraints being considered.

- Three points can be concluded:
  - SparkFunds can go on with the Venture funding round type which is 59.6% among the given and chosen funding investment types.

  - The top 3 countries that can be invested in with ease of communication are USA , Great Britain and India

  - The common booming sectors which can be invested in respective selected countries in number of investments are:
    - Others & Cleantech/Semiconductors