INVESTMENT ASSIGNMENT

SUBMISSION

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Spark Funds Investment Analysis Assignment

Project Overview:

You worked for Spark Funds, an [asset management company](). Spark Funds wants to make investments in a few companies. The CEO of Spark Funds wants to understand the global trends in investments so that she can take the investment decisions effectively.

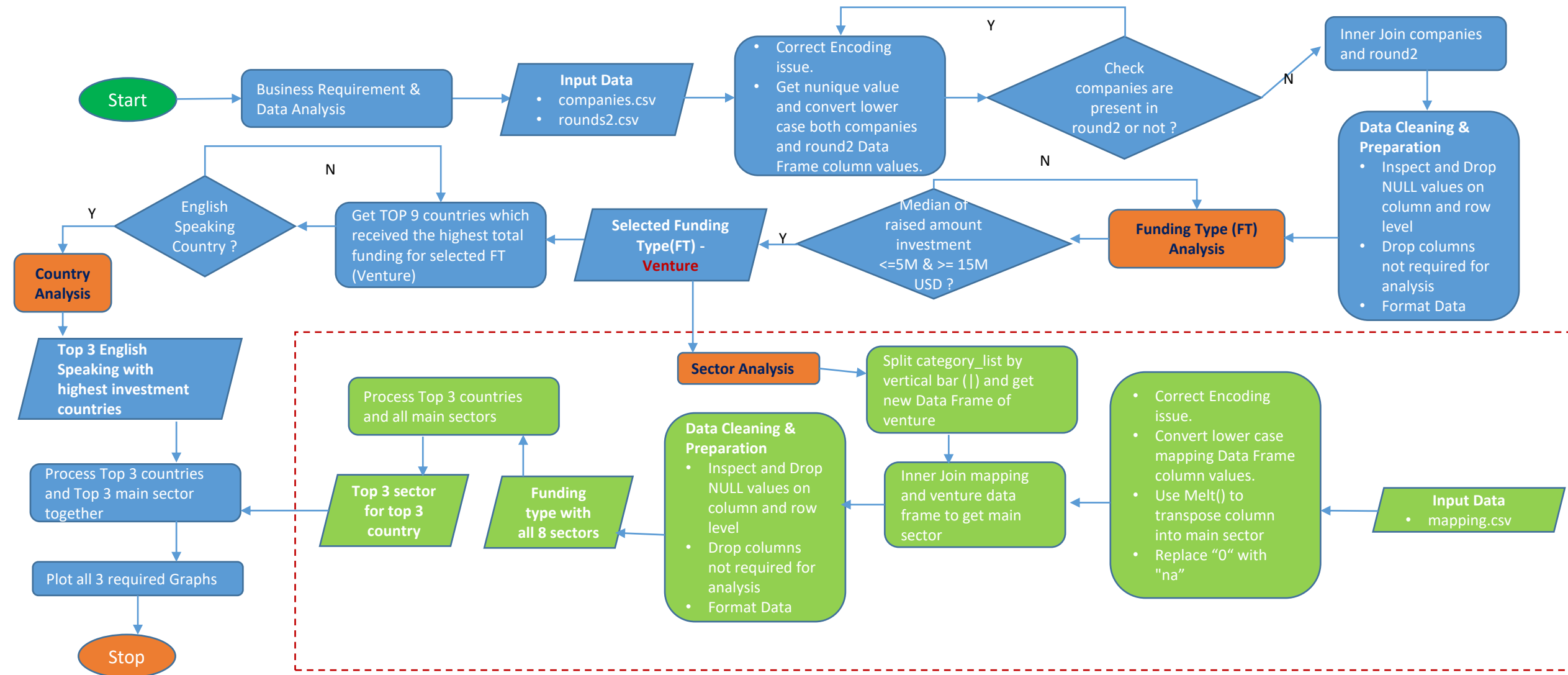**Spark Funds has two minor constraints for investments:**

- They wants to invest between 5 to 15 million USD per round of investment.
- They wants to invest only in English-speaking countries because of the ease of communication with the companies it would invest in.

Reference Links

- Real investment data taken from [link].
- List of countries where English is an official language [link].

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.

Problem solving methodology

```
Start
  ↓
Business Requirement & Data Analysis
  ↓
Input Data
  • companies.csv
  • rounds2.csv
  ↓
• Correct Encoding issue.
• Get nunique value and convert lower case both companies and round2 Data Frame column values.
  ↓
Check companies are present in round2 or not ?
  — Y → (loop back)
  — N → Inner Join companies and round2
           ↓
         Data Cleaning & Preparation
           • Inspect and Drop NULL values on column and row level
           • Drop columns not required for analysis
           • Format Data
  — N → Funding Type (FT) Analysis
           ↓
         Median of raised amount investment <=5M & >= 15M USD ?
           — Y → Selected Funding Type(FT) - Venture
                   ↓
                 Get TOP 9 countries which received the highest total funding for selected FT (Venture)
                   ↓
                 English Speaking Country ?
                   — N → (loop)
                   — Y → Country Analysis
                           ↓
                         Top 3 English Speaking with highest investment countries
                           ↓
                         Process Top 3 countries and Top 3 main sector together
                           ↓
                         Plot all 3 required Graphs
                           ↓
                         Stop
```

Selected Funding Type(FT) - **Venture**
  ↓
Sector Analysis → Split category_list by vertical bar (|) and get new Data Frame of venture
  ↓
Inner Join mapping and venture data frame to get main sector
  ↓
• Correct Encoding issue.
• Convert lower case mapping Data Frame column values.
• Use Melt() to transpose column into main sector
• Replace "0" with "na"
  ↑
Input Data
  • mapping.csv

Data Cleaning & Preparation
  • Inspect and Drop NULL values on column and row level
  • Drop columns not required for analysis
  • Format Data
  ↓
Funding type with all 8 sectors
  ↓
Top 3 sector for top 3 country
  ↓
Process Top 3 countries and Top 3 main sector together

Process Top 3 countries and all main sectors

Funding Type Analysis

❖ Spark Funds wants to choose one of these four investment types(venture, angel, seed, and private equity) for each potential investment they will make.

❖ Spark Funds wants to invest between **5 to 15 million USD** per investment round.

❖ **MEAN** gives an average of all the values.

❖ **MEDIAN** gives a typical value that could be used to represent the entire group.

Note: As a simple rule of thumb, **median** is almost always a better measure of '**representativeness**'.

❖ Figure A, shows the median of all 4 investment type on which Spark Fund is focusing.

❖ "Private equity" fund is going above the 15M USD limit while "angel" and "seed" is going below the 5M USD limit.

❖ **Based on above results "venture" is best investment type suitable for Spark Funds which is coming within their limits.**

For Graphical representation, please click [Here]

funding_round_type	raised_amount_usd
private_equity	20000000.0
venture	5000000.0
angel	400000.0
seed	275000.0

Figure A – Representative value for above 4 investment type

Country Analysis

❖ Spark Funds wants to invest in countries with the highest amount of funding for the chosen investment type (i.e. "Venture"). This is a part of its broader strategy to invest where most investments are occurring.

❖ Top nine countries which have received the highest total funding (across ALL sectors for the chosen investment type) are shown below in "Figure B".

❖ Top 3 English speaking countries from "Figure B" is **USA**, **GBR** and **IND** (as shown in "Figure C") is suitable for investment.

❖ **For Graphical representation, please click [Here]**

country_code	raised_amount_usd
USA	4.225108e+11
CHN	3.983542e+10
GBR	2.024563e+10
IND	1.439186e+10
CAN	9.583332e+09
FRA	7.259537e+09
ISR	6.907515e+09
DEU	6.346960e+09
JPN	3.363677e+09

Figure B – Top 9 Countries having highest funding

country_code	raised_amount_usd
USA	4.225108e+11
GBR	2.024563e+10
IND	1.439186e+10

Figure C – Top 3 English Speaking Countries

Sector Analysis

- ❖ Previously gathered data, provide below outcome and
  - ▪ Funding Type (FT): "Venture"
  - ▪ Country 1 (C1): USA
  - ▪ Country 2 (C2): GBR
  - ▪ Country 3 (C3): IND
  - ▪ Range of funding: 5 to 15 million USD
- ❖ Based on sector analysis, below data gives top 3 sectors for top 3 countries.
- ❖ USA
  - ❖ Others
  - ❖ Social, finance, analytics, advertising
  - ❖ Cleantech / semiconductors
- ❖ GBR
  - ❖ Others
  - ❖ Social, finance, analytics, advertising
  - ❖ Cleantech / semiconductor
- ❖ IND
  - ❖ Others
  - ❖ Social, finance, analytics, advertising
  - ❖ News, search and messaging

For Graphical representation, please click [Here]

main_sector	total_investment_count	country_code
others	2950	USA
social, finance, analytics, advertising	2714	USA
cleantech / semiconductors	2350	USA
others	147	GBR
social, finance, analytics, advertising	133	GBR
cleantech / semiconductors	130	GBR
others	110	IND
social, finance, analytics, advertising	60	IND
news, search and messaging	52	IND

Figure D – No. of Investments in the Top 3 Sectors of the Top 3 Countries

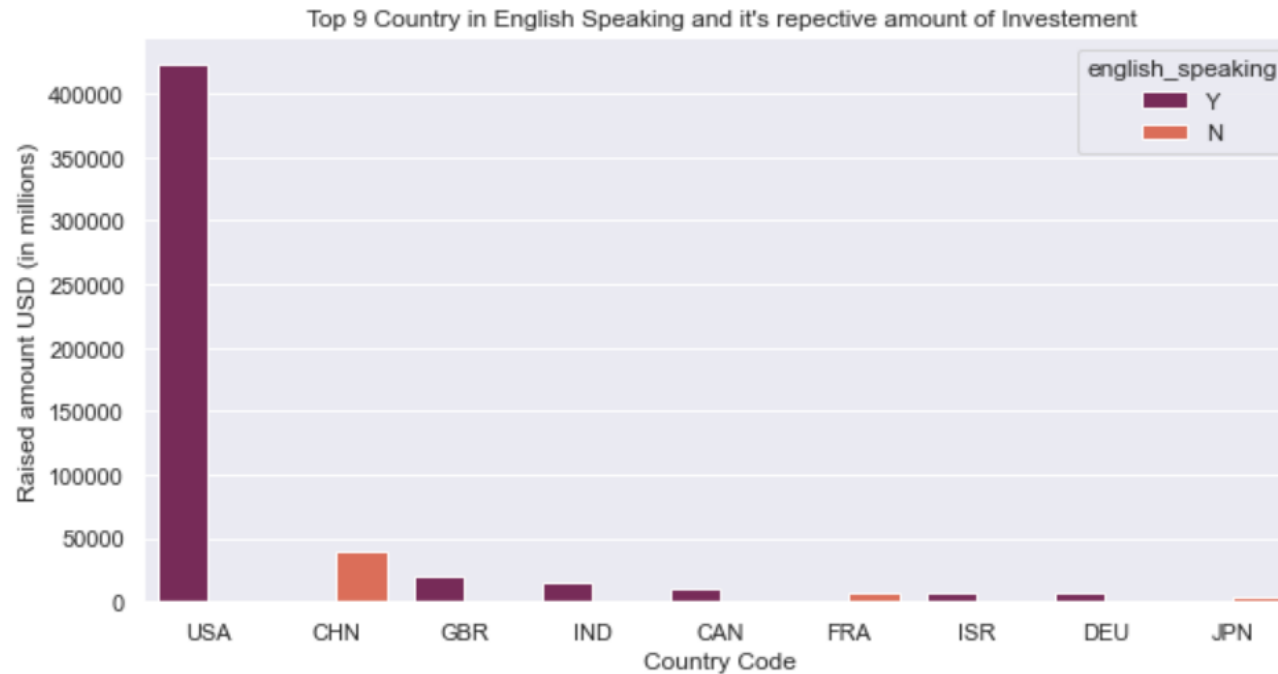# Plot 1 – Funds Type Analysis

❖ A plot showing **the representative amount of investment** in each funding type.

❖ This chart should make it clear that a certain funding type (FT) is best suited for Spark Funds.

❖ **Yellow** line on graph represent the 5M USD Limit
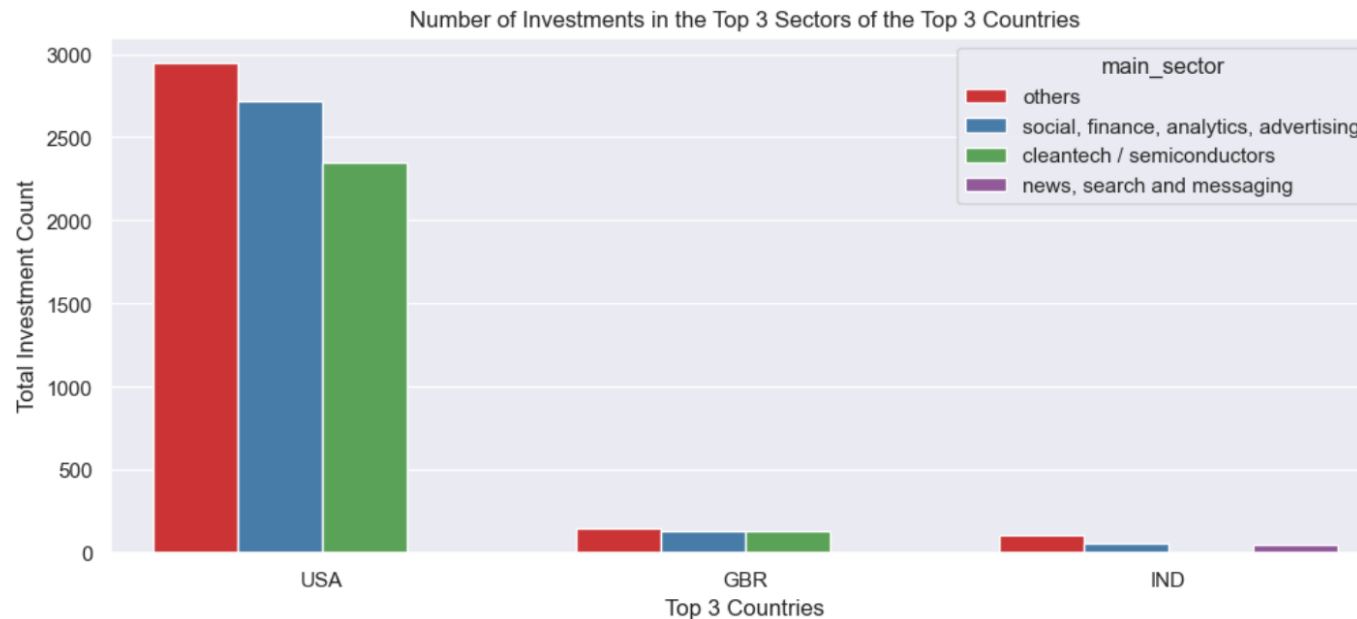
❖ **Gray** line on graph represent 15M USD Limit

Plot 2 – Country Analysis

❖ A plot showing the **top 9 countries against the total amount of investments** of funding type FT (i,e. "Venture").

❖ This chart give clear understanding about the top 3 countries.

❖ Here, country showing in **orange** are non-English speaking country while others are English speaking.

❖ Based on below, tope 3 English speaking and suitable for investment is "**USA", "GBR" and "IND"**

Plot 3 - Sector Analysis

❖ A plot showing the number of investments in the top 3 sectors of the top 3 countries on one chart (for "Venture" investment type FT).
❖ This plot should clearly display the top 3 sectors each in USA, GBR, IND.

Number of Investments in the Top 3 Sectors of the Top 3 Countries

Conclusions

Considering all constraints and Spark Funds requirements, below is the conclusion:

❖ Spark Fund should invest in investment type "**Venture**".

❖ To distribute the risk related to economy, company should invest in top 3 countries "**USA**", "**GBR**" and "**IND**" as well.

❖ Major investment made in USA as compare to other two country

❖ More on granular level, Spark Fund should investment in below sector in respective country for better results.
- USA
  - Others (Virtustream)
  - Social, finance, analytics, advertising (Shotspotter)
- GBR
  - Others (Electric-cloud)
  - Social, finance, analytics, advertising (Celltick-technologies)
- IND
  - Others (Firstcry-com)
  - Social, finance, analytics, advertising (Manthan-systems)