CZ1003: Introduction to Computational Thinking

Assignment 1

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Muthu Currency Converter

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Introduction

In this heavily globalised environment that we live in, travelling the world is no longer a privilege only for the rich. With the emergence of budget airlines and accommodation sites like AirBnB, expenditure on flying and staying in a foreign country has been significantly reduced, allowing travelling overseas to become an accessible commodity for Singaporeans. As their travel expenses depends largely on the strength of Singapore's currency, it is necessary for Singaporeans to know the right time to change their currency prior to travelling overseas in order to make the most out of their money. This can be achieved by the frequent monitoring of exchange rates.

Problem Statement

As exchange rates fluctuate on a day-to-day basis, Singaporeans who are planning for their overseas trip have to constantly look out for the best exchange rate. This repetitive and mundane job will eventually become a hassle. In addition to their hectic lifestyle, they might give up on hoping to get the best rates by frequent monitoring. This could incur needless expenditure when they exchange currencies at the least optimal period.

Current Solution

There are currently many tools available online to help Singaporeans make informed decisions when exchanging currencies. One such tool is by utilising Google to search for the latest exchange rates. However, this solution may not be convenient enough for users as they need to deliberately enquire for the rates. As a result, the act of monitoring becomes repetitive and mundane.

There are many paid applications that offer live rates, graphical trends and even projected rates all from the convenience of a mobile phone. However, this does not improve the user experience of finding exchange rates. In addition, users still get bombarded with a barrage of pop-up advertisements that are usually bundled with these free applications.

Currency rates are subjected to change any time since they are highly volatile. For Singaporeans to obtain the best foreign currency possible, it is important for them to know when is the optimal time to exchange their money. Thus there is a need for a cost-effective and convenient platform to monitor exchange rates effortlessly.

Proposed Solution

Description of Various Functions

We devised a Telegram Bot dubbed The Muthu Currency, an interactive and multi-functional currency converter designed especially for Singaporeans. It aims to help Singaporeans make informed decisions when exchanging their currency. Users can choose from a list of 31 other currencies (Figure. 1) to convert Singapore Dollars (SGD) to. The rates will be shown first before proceeding to enter the amount of SGD they want to exchange, simply by using the number pad provided (Figure. 2).
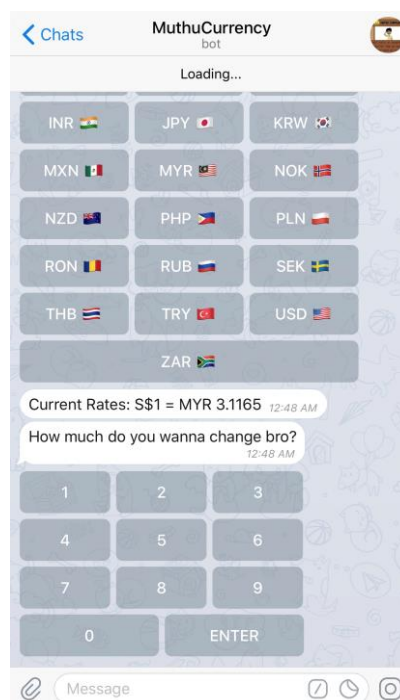

Figure. 1:
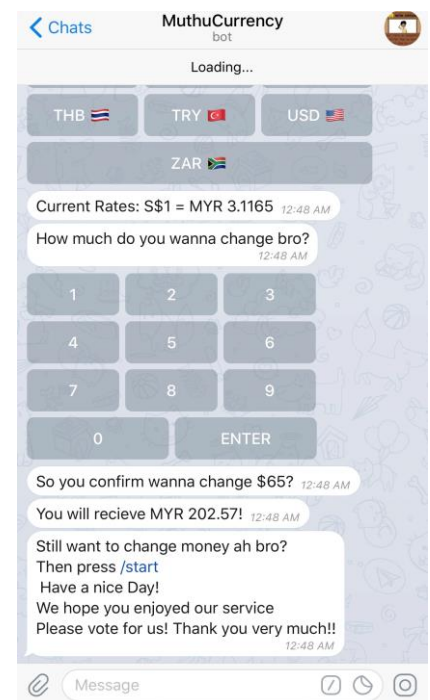List of Currencies

Figure. 2:
Number Pad

Figure. 3:
Converted Amount

Benefits

Compared to other currency converter applications Muthu Currency allows the user to do basic trend analysis of currencies. For example, if the user wants to analyse the trend for American Dollars (USD), the bot will display the rates for today, yesterday and a week ago. A comparison will be made and the percentage change will be calculated (Figure. 4).
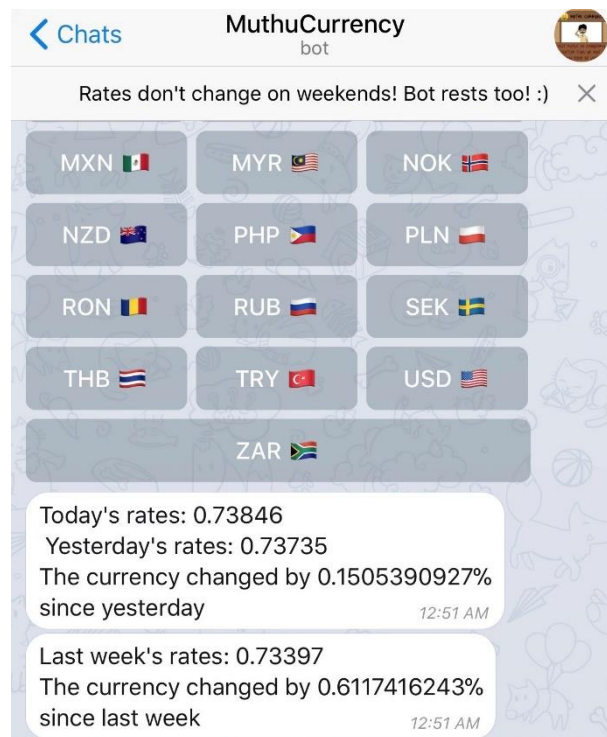

Figure. 4:
Percentage Change of Rates

This makes it more convenient for the user to check and understand the fluctuation of USD rates, aiding him or her to decide when is the best time/day to buy USD.

The bot has an alarm function (Figure. 5 and 6) whereby the user can schedule the bot to inform him or her the rates in 24 hours' time. This value adds to the bot as it eliminates the need for the user to go through the entire process to obtain the rates for the selective foreign currency, making less repetitive to use.

Figure. 5:
'Yes' to receive update

Figure. 6:
'No' to receive update

Muthu Currency has a user-friendly interface, as it uses customized inline-keyboard where every input is executed simply by tapping on the keys. This guided interface will avoid input variations and reduce confusion when navigating around the bot.

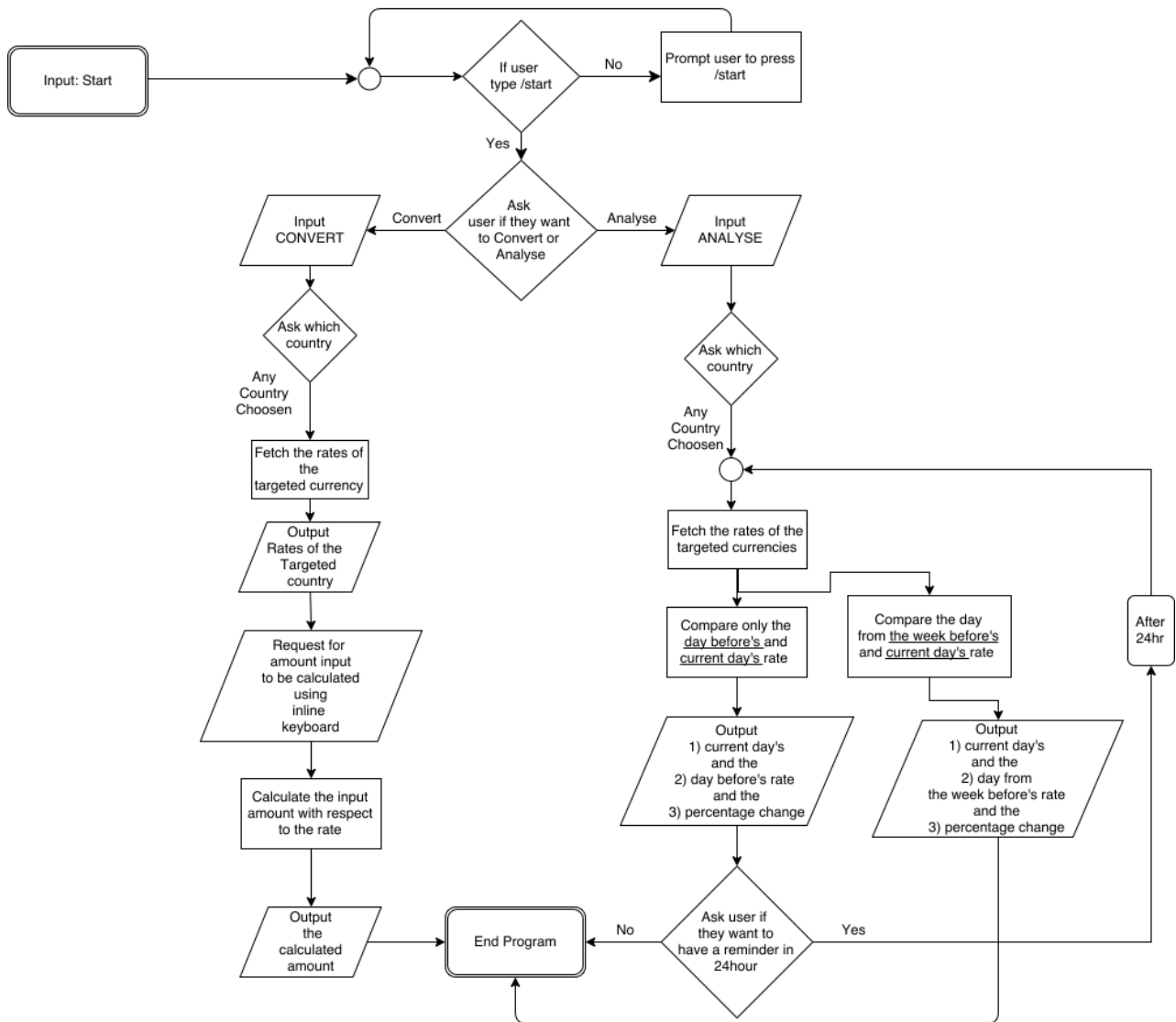## Flow Chart for the Sequence of Events of Bot

Figure 7: Flow Chart of Bot

Constraints, Limitations and Possible Future Product Development

Constraints

Muthu Currency Bot is only able to fetch the exchange rates on weekdays. This constraint arises due to the methodology used in extracting the latest exchange rates. The current methodology to extract exchange rates uses Fixer.io, a free open-source API, which updates only on weekdays at 11 P.M. (+8GMT). Alternatively, the rates could be obtained via web scrapping from websites. However, it is known to be unstable as any format changes in the website will affect the functionality of the bot. To solve the inability to fetch latest exchange rates on weekends, it is possible if our group subscribed to paid premium APIs which can support exchange rates update 24/7.

Limitations

In addition, due to the lack of experience in programming and time constraint, our team is only successful in implementing Muthu Currency Bot in private, but not in a group. With more time and upgrading of programming skill, the team would confident in upgrading the bot.

Product Development

We hope that we can further develop Muthu Currency to automatically notify users when their desired rate is achieved or the exchange rate has reached a new peak. We will also want to implement an extra function which provide the locations of nearby money changers to assist the user in buying foreign currencies readily when the currency reaches the user's desired value.

Conclusion

In conclusion, Muthu Currency Bot enables Singaporeans to save travel expenses by helping them to make informed decisions when exchanging currencies before travelling overseas. As a bonus, Muthu Currency is free to use. We believe that with its interactivity, it will be useful and serve as a handy companion for potential travelers.