Orbital Mission Control

Telegram Bots

Azeem Vasanwala | Parth Gujar

NUS HACKERS

Azeem
Vasanwala
Y4 CS

Parth Gujar
Y2 CS

Simple Ground Rules

- Question? Use **the raise hand** ✋function on Zoom, or send your message in the chat

- *Stuck?* Join the breakout room. Someone will be with you shortly

- Ask as many questions as you want!

What is a "bot"?

A software application that is programmed to do certain tasks

What can I do with a bot?

Common Use Cases

How do people *usually* use bots?

- Performing simple tasks based on the input of the users such as:

  - "Get me the bus timings"

  - "Add these numbers up"

  - Solve the quadratic equation **(fun, I know)**

- to complex tasks such as:

  - "Find me the name of the object in this image"

  - "Be my friend and chat with me 😭 "

- Pre-req: You have a **telegram account** and **a gmail account**

  - If you don't, use the zoom raise hand✋function **NOW**

Why Bots?

Why Bots?

- ***"It's Like a CLI on steroids"*** - devops.com

  - (Mostly) Navigationless Interface - No menu bars to dig around to find information and hence it can be a lott..tt faster and efficient!

    - Try finding the curriculum for an older batch on the SOC website without googling 🙃

    - Try to find out the procedures of applying to a certain hall or residential college in NUS now without googling

etc…

Telegram Bots

- Chat messaging platform

  - Similar to WhatsApp, WeChat, etc

  - Cloud based, not P2P

- Bots are **natively supported** on the platform

- Texting a bot is similar to texting another person

Why Telegram Bots?

- Telegram native support for bots:

  - Vast array of SDKs and libraries to build a bot :https://core.telegram.org/bots/samples.

  - No complex integrations, device specific compatibility, etc. as most of them has been abstracted away by Telegram app.

- Familiar UI

  - We all know how to use messaging apps (Line, WhatsApp, QQ Chat, KakaoTalk, etc.)

  - Show what you have built to your friends and ask them to use it!!

Some Famous Telegram Bots

- AirTrack

  - A bot that helps to keep track of the price of selected air routes

- Productivity Bots (e.g. Gmail Bots, Trello Bots, NV Bots, etc)

  - They are made to complement the web applications. For example, with gmail bots, you can check your new emails in telegram.

- Werewolf Moderator Bot

  - As the name suggests, it is a werewolf game moderator.

Our Environment

- Google CoLaboratory

  - Python development environment on Google's servers

    - No autocompletion, very sad 🙁

  - Duplicate this notebook: https://hckr.cc/2023OTBC

    - File → Save a Copy in Drive

Creating a Bot

- Launch Telegram

- Search for the user **@BotFather**

- Create a Bot

  - Name it whatever you want

  - Give it whatever handle you want, but make sure it ends in `bot`

Back to CoLab

Getting started

- Pre-req: Your packages are installed with `!pip install python-telegram-bot` in the Google Colab notebook

- Update the token with your own token

- Run the bot once

- Text the bot and say hello to it, it should echo "hello" back to you

What's going on?

So now… Solve the quadratic equation

- Expected input: 3 numbers representing a, b and c from ax^2+bx+c

  - e.g: /quadratic 1 2 1

- Expected output: "`Your roots are {r1} and {r2}`"

- If you have no python experience, there will be a small hint to get you started

  - Googling the rest of the way will be enough

- Aim to finish in next 15 mins

Great! You can manipulate input 😄

Common Interactions

How do people *usually* use bots?

- Perform manipulation of input from user

  - "Get me the bus timings"

  - "Add these numbers up"

  - Solve a quadratic equation **(fun, I know)**

    - Let's build a bot to do this

    - Pre-req: You have a telegram account and a gmail account

Common Interactions

How do people *usually* use bots?

- Retrieve information from somewhere else

  - Get information from a database or API (e.g Bus bots)

- Lets create another command that can get a picture of a cat

  - https://cataas.com/cat

  - API you need: `update.message.reply_photo(photo=url)`

- Do you keep getting the same picture back?

  - Telegram is caching the url

    - Fix by appending a random number to the end as a query parameter

Common Interactions

How do people *usually* use bots?

- Alert user when something has happened

  - It started raining

  - Your semester results were released

- Lets make another bot that alerts the user when a webpage updates

  - How do we interact with a webpage programmatically?

Side track: HTTP Verbs

What? Verbs? This isn't English class…

- HTTP: HyperText Transfer Protocol

  - Basically how the internet communicates

- 4 Main Verbs

  - GET [Retrieve]

  - POST [Create]

  - PUT [Update]

  - DELETE [Delete]

Common Interactions
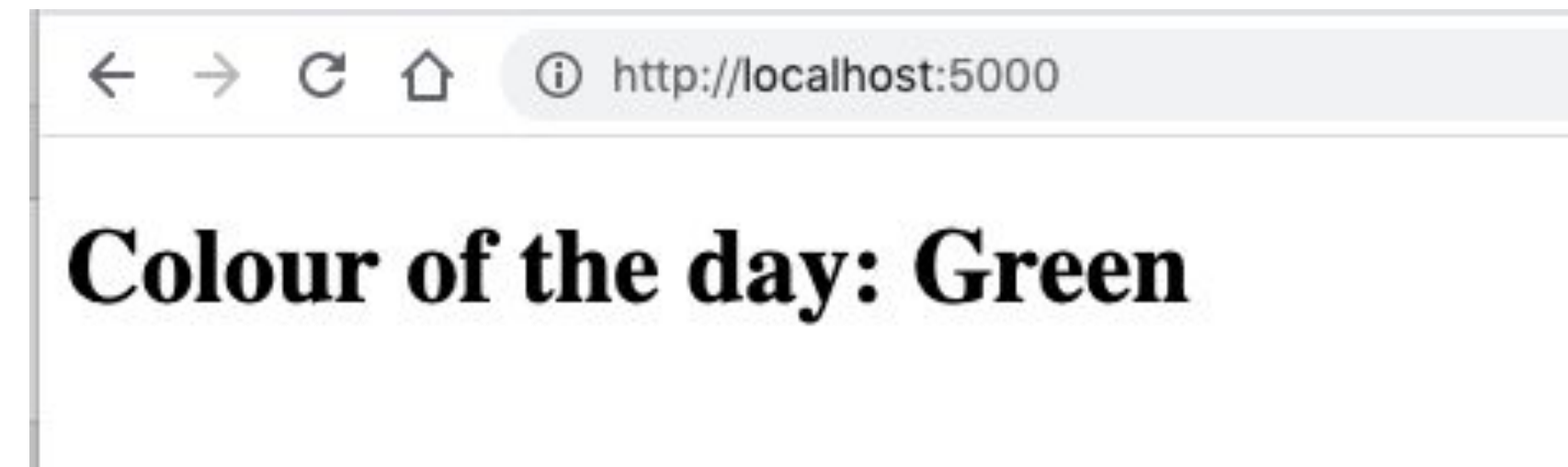
How do people *usually* use bots?

- Alert user when something has happened

  - It started raining

  - Your semester results were released

- Lets make another bot that alerts the user when a webpage updates

  - How do we interact with a webpage programmatically?

    - HTTP requests using the python `requests` library

Your second bot

- Makes the following additional import

    - `requests`

- Will attempt to listen for updates to a service or a website

- Will alert you after an update

What will your bot do?

Colour of the day: Green

- Query a webpage that looks like this =>

- When the colour changes to "Blue", send a message to yourself

  - How do you message yourself?

    - You need your `chat_id`. Send `/start` to `@userinfobot`

- Where is the website?

  - Hosted on DO - don't do anything funky, its just a simple webpage

Great! You can monitor other services 😄
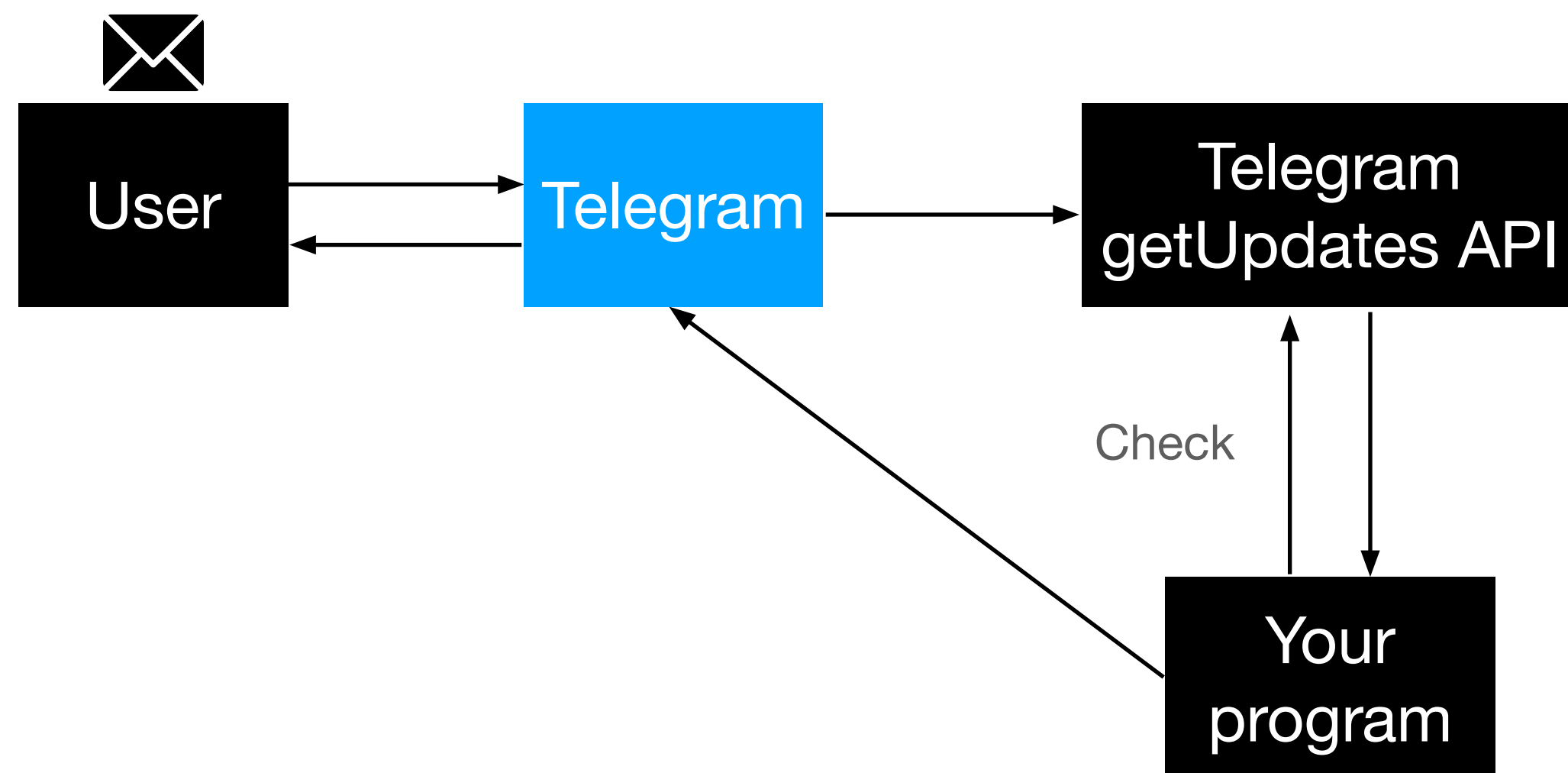
Let's Check the Code Out!

- Lets do something simple: An attendance bot

  - Follow along to understand the implementation first, then try it yourself later
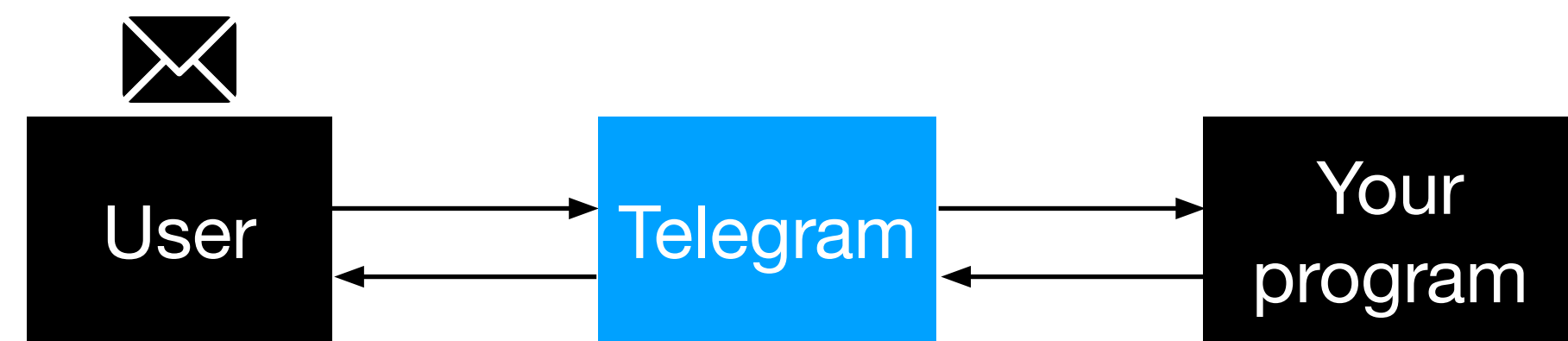
Let's take a look

Extra: Webhook vs Polling

- Remember `application.run_polling()`?

- What does that mean?

Polling

Webhook

Extra: Hosting your Telegram Bot

- To this end, all of our telegram bots codes have been hosted by Google Colab, but a Google Colab Session is only 12 hours maximum in duration for a single session and Google Colab definitely is not a hosting platform

- There are a few options if you want to host your own Telegram Bot:

    - Heroku, Digital Ocean, etc: Cloud Platform-as-a-Service

    - AWS Beanstalk: Orchestration service to deploy applications, has support for AWS RDS (Database), Load Balancer, etc.

    - Starts your own Rasperry Pi server using any web server tools such as Nginx, or alternatively can use Ngrok

Further Reading & Resources

Telegram's Bot API

- Telegram

  - https://core.telegram.org/bots/api

- Other things you can do

  - Accept payments (https://core.telegram.org/bots/payments)

    - Talk to @ShopBot

  - Log In with Telegram (https://core.telegram.org/api/passport)

  - Create Games (https://core.telegram.org/bots/games)

Further Reading & Resources

SDKs

- https://github.com/python-telegram-bot/python-telegram-bot

  - Learning By Example

  - Documentation

- Want to use nodejs?

  - https://github.com/yagop/node-telegram-bot-api

- Other SDKs for other languages: https://core.telegram.org/bots/samples

Good Practices

- Your token is precious

  - Don't commit it to Git

    - People can do nasty things with it

  - Inject it into your code via an environment variable

- Your username and user_id is precious too

- Manage your packages properly

  - Use pip, npm, maven, whatever

What we did today

- Request-Reponse:

- Server-Side Alerts:

- Group-based Interactions:

- Git Repo with everything from today:
  https://github.com/parth-io/orbital-2023-telegram-bots/blob/master/attendance-bot/bot.py