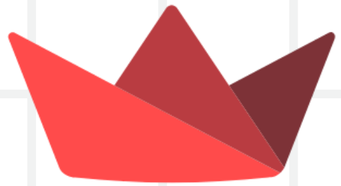
INTRODUCTION TO



Streamlit

Local Hack Week | 2024

Mohammed Moiz Pasha

ABOUT ME

Hi! I’m Mohammed Moiz Pasha

I love working on AI, ML, DS and web security.
Won 6 hackathons, including Streamlit’s LLM Hackathon
I enjoy conversations about anything and everything involving technology :) (except javascript, you’re on your own there)

CONTENT

PHASE 1

Understanding UI and the need for Streamlit

PHASE 2

The basics of working with Streamlit

PHASE 3

Use cases and Let’s build!

PROGRAMMING

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```
/tmp/lmiB1qDjTU.o
Enter the number of terms: 10
Fibonacci Series: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34,
```

```
/tmp/58lk006y7X.o
Enter coefficients a, b, and c: 3 5 7
Roots are complex and different.
Root 1 = -0.83 + 1.28i
Root 2 = -0.83 - 1.28i
```

CHARACTER USER INTERFACE (CUI)

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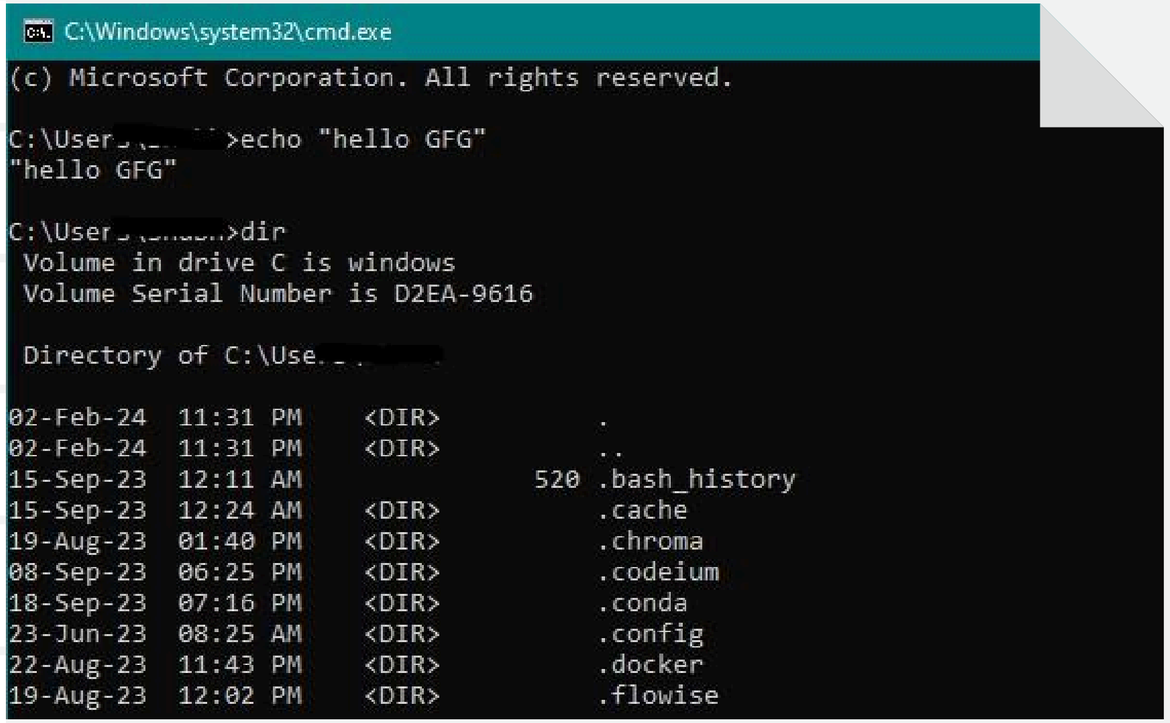
CUI



- Only text based input/output
- Use commands to get the computer to do stuff
- No Graphics or Icons
- Scrollable text windows

PROBLEM

- Not intuitive for new users
- Inefficient for complex tasks
- No visualization
- Limited Customization

GRAPHICAL USER INTERFACE (GUI)

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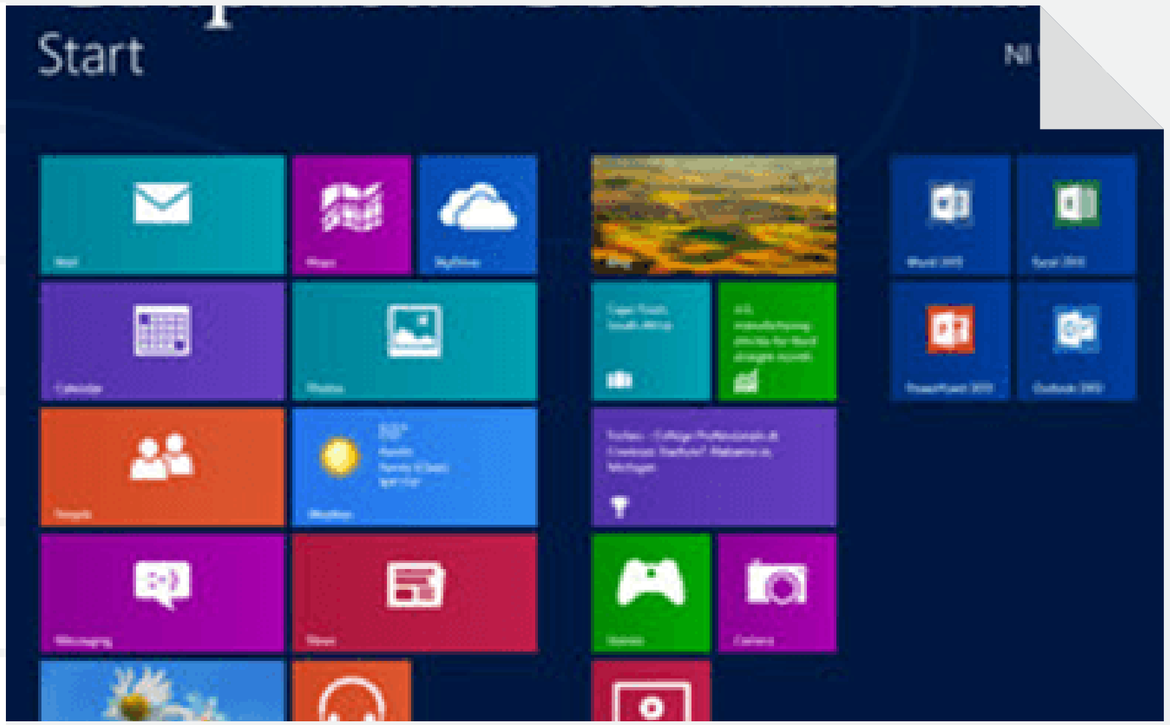
GUI



- Graphical elements (Icons, buttons, etc)
- Keyboard + Point-and-Click Interaction
- Customizable

HOW DO YOU CREATE A GUI?

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WAYS TO CREATE A GUI

WEB APPS

HTML/CSS/JS

NON-WEB APPS

- Python: Tkinter, PyQt, Kivy
- Java: Swing, JavaFX
- C#: Windows Forms, WPF (Windows Presentation Foundation)
- C++: Qt, wxWidgets

CODE FOR GUI

```
<!DOCTYPE html>
<html>
<body>
<div class="container-fluid">
    <header>
        <h1>Adding two numbers</h1>
    </header>
    <label>number 1</label>
    <input type="text" name="number1" id="number1" placeholder="enter single digit number"> <br>
    +<br>
    <label>number 2</label>
    <input type="text" name="number2" id="number2" placeholder="enter single digit number"><br>
    <button type="button" class="btn btn-info" onclick="submit1()">submit</button><br><br>
    <div class="screen" id="screen1"></div>
</div> <!-- End Container-->
<script src="https://ajax.googleapis.com/ajax/libs/jquery/1.12.2/jquery.min.js"></script>
<script>
$( document ).ready(function() {
});
function submit1(){
    var a =  document.getElementById("number1").value;
    var b =  document.getElementById("number2").value;
    var c = parseInt(a) + parseInt(b);
    document.getElementById("screen1").innerHTML=c;
  }
</script>
</body>
</html>
```

CODE FOR GUI

Adding two numbers

number 1 123

+

number 2 213

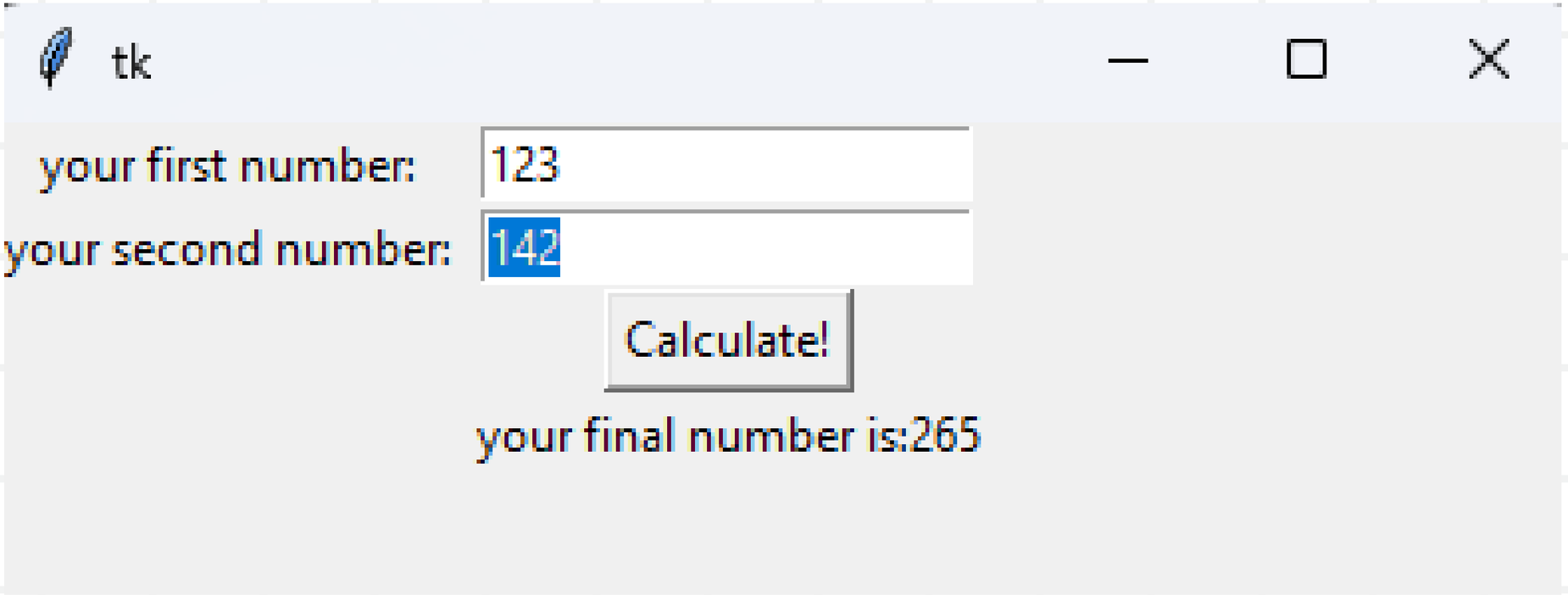
submit

336

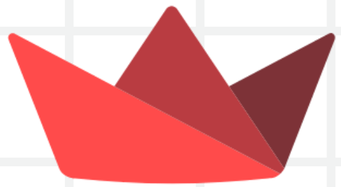
CODE FOR GUI

```
from tkinter import *
root = Tk()
root.geometry("400x400")
Label(root, text="your first number:").grid(row=0, column=0)
Label(root, text="your second number:").grid(row=1, column=0)
label3 = Label(root)
label3.grid(row=3, column=1)
first_no = IntVar()
second_no = IntVar()
entry1 = Entry(root, textvariable=first_no).grid(row=0, column=1)
entry2 = Entry(root, textvariable=second_no).grid(row=1, column=1)
def add():
    sumation = first_no.get() + second_no.get()
    label3.config(text="your final number is:" + str(sumation))
mybutton = Button(root, text=("Calculate!"), command=add).grid(row=2, column=1)
root.mainloop()
```

CODE FOR GUI


tk
your first number:
123
your second number:
142
Calculate!
your final number is:265


SEE ALL YOUR WONDERFUL DESIGNS?
LIGHTYEAR
NOT POSSIBLE TO IMPLEMENT
imgflip.com



Streamlit

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STREAMLIT

- Streamlit is an open-source Python framework for data scientists and AI/ML engineers to deliver dynamic data apps with only a few lines of code

- Streamlit turns data scripts into shareable web apps in minutes.

- All Streamlit code is written in pure Python, so no front-end experience required.

EXAMPLE

STREAMLIT

- Streamlit is completely free to install and use
- It supports almost every major widget and element required to create a fully functioning web application
- It also allows you to add custom HTML, to incorporate your own templates into the web app along with Streamlit elements
- Highly customizable

STREAMLIT

- **Best part? You can also deploy a website with your code within minutes, for FREE!**

  Example: https://interrogaite.streamlit.app/

LET'S GET STARTED!

INSTALLATION AND DEMO

1. Set up your Python development environment.

2. Run:

```
pip install streamlit
```

3. Validate the installation by running our Hello app:

```
streamlit hello
```

4. Jump to our Basic concepts.

LET'S BUILD!

https://kengik-calculator-advanced.streamlit.app/

STREAMLIT ELEMENTS

TEXT ELEMENTS

- st.write()
- st.markdown()
- st.title()
- st.header()
- st.subheader()
- st.code()

INPUT WIDGETS

- st.button()
- st.download_button()
- st.feedback()
- st.link_button()
- st.checkbox()
- st.number_input()
- st.text_input() ...

STREAMLIT ELEMENTS

MORE INPUT WIDGETS

- st.slider()
- st.date_input()
- st.camera_input()
- st.file_uploader()

STATUS ELEMENTS

- st.progress()
- st.spinner()
- st.success()

STREAMLIT ELEMENTS

DATA ELEMENTS

- st.dataframe()
- st.table()
- st.metrics()

CHART ELEMENTS

- st.area_chart()
- st.bar_chart()
- st.line_chart()
- st.pyplot()

STREAMLIT ELEMENTS

MISCELLANEOUS

- st.expander()
- st.popover()
- st.tabs()
- st.sidebar()

MEDIA ELEMENTS

- st.image()
- st.audio()
- st.video()
- st.logo()

https://docs.streamlit.io/develop/api-reference

LET'S BUILD A SIMPLE APPLICATION

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BUILDING A CHATBOT

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DEPLOYMENT

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STEPS TO DEPLOY

1. **Create App: Write your Python app (app.py).**
2. **Test Locally: Run streamlit run app.py to test it locally.**
3. **Set Up GitHub Repository: Push your app.py and other necessary files to a GitHub repository.**
4. **Sign Up/Log In to Streamlit Cloud: Go to Streamlit Cloud.**
5. **Deploy: Click "New App" on Streamlit Cloud, connect your GitHub repo, select the branch and app file, then deploy.**
6. **Manage App: Update code, and changes will auto-deploy on Streamlit Cloud.**

COOL APPS

- **Wiki Search: https://wiki-search.streamlit.app/**
- **Prettymapp: https://prettymapp.streamlit.app/**
- **Pixmatchgame: https://pixmatchgame.streamlit.app/**
- **Monte Carlo Visualization: https://mesmith027-streamlit-webapps-mc-pistreamlit-app-l4b15e.streamlit.app/**
- **H3 world: https://h3-snow.streamlit.app/**

RESOURCES

- https://docs.streamlit.io/
- https://github.com/MarcSkovMadsen/awesome-streamlit#awesome-resources
- https://github.com/tushar2704/Streamlit-Magic-Cheat-Sheets
- https://www.youtube.com/watch?v=ZZ4B0QUHuNc&list=PLtqF5YXg7GLmCvTswG32NqQypOuYkPRUE
- https://www.youtube.com/watch?v=HKoOBiAaHGg

QUESTIONS?

STUFF TO DO

1. Learn more about Streamlit from the resources provided
2. Create a Streamlit app of your own (Implement any Python code, use ML models, etc.)
3. Upload your app to a public Github repository
4. Deploy your app on Streamlit Cloud!
5. Keep experimenting with different widgets, elements and design ideas for your next project.

STUFF TO DO

Share your learnings! Create a social media post on Linkedin, Instagram or any social media platform, and tag us!

Use the hashtag “#lhwsnist24” so that we get to know what you built!

STUFF TO DO

Don’t stop learning! Use this session as an introduction to the world of GUI programming in Python, and see what other stuff you can find!

Any questions? Send a connection request on my Linkedin: https://linkedin.com/in/mopasha

THANK YOU!