



MERO PDF MITRA

“PDF ANSWER RETRIEVER SYSTEM”

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PROJECT DEFENCE

OUR TEAM



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TABLE OF CONTENTS

.....

01

INTRODUCTION

04

OCR

02

METHODOLOGY

05

MOBILE APP

03

MODEL
IMPLEMENTATION

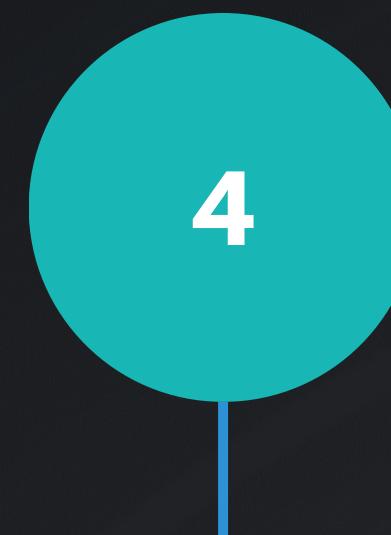
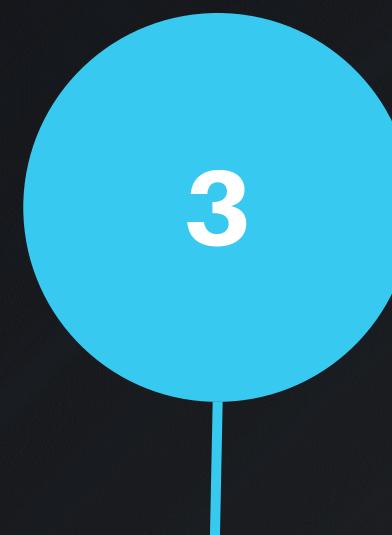
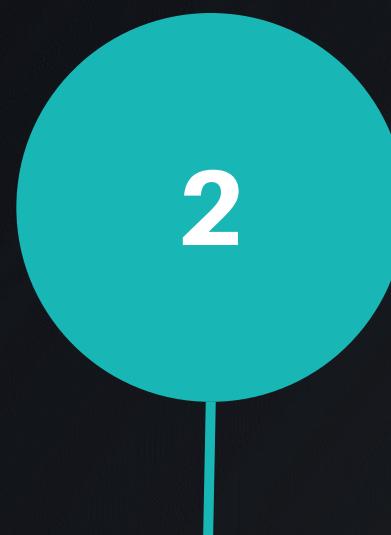
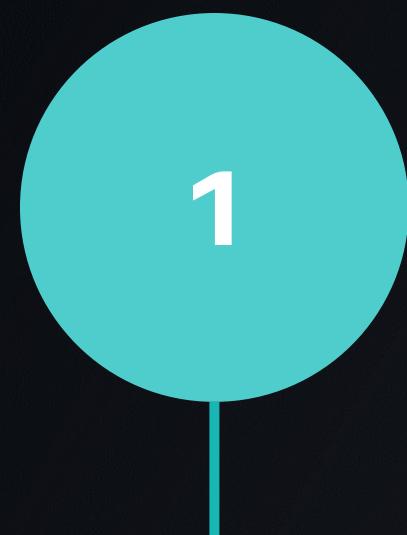
INTRODUCTION

PDF ANSWER RETRIEVER SYSTEM



- Query and answer retrieval using langchain framework
- Upload pdf from application to model using http post api





ACCESSIBILITY

PRECISEDNESS

AVAILABILITY

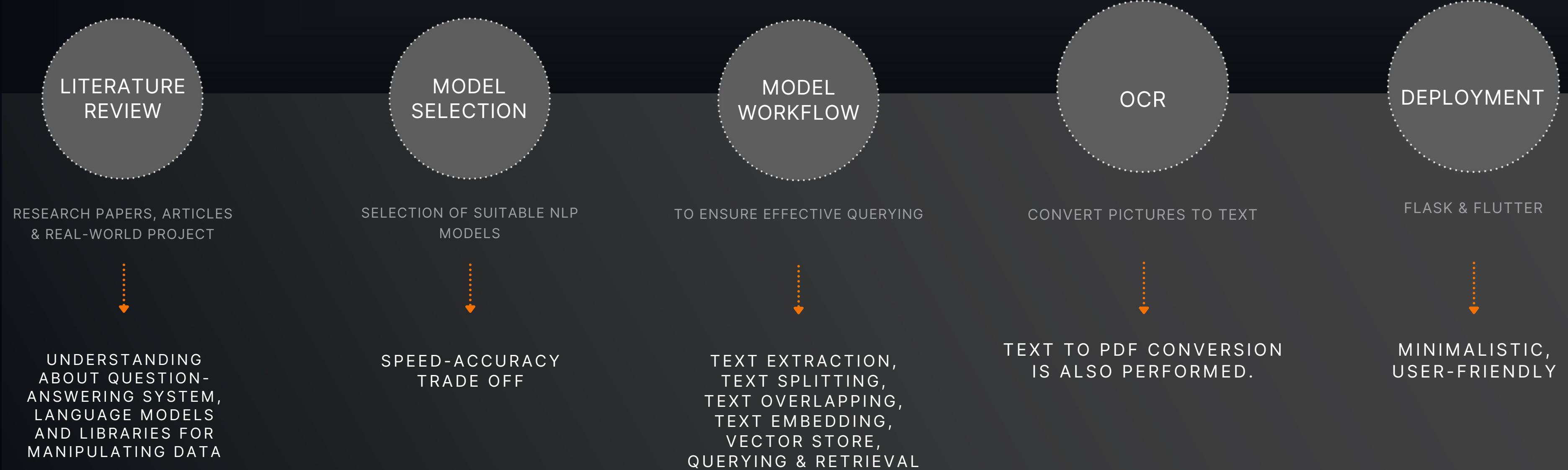
CONFIDENTIALITY

SPECIALIZED
TRAINING/TESTING



METHODOLOGIES

MODEL SELECTION & MODEL WORKFLOW EXPLAINED IN DETAIL IN NEXT SLIDES.



MODEL SELECTION & EVALUATION



1

NATURAL LANGUAGE
PROCESSING

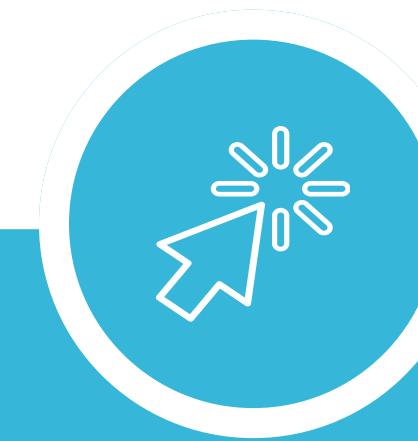
Ability to understand text and spoken words in much the same way human beings can.



2

LLMS

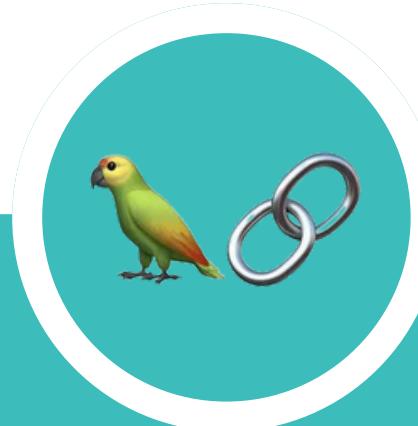
deep learning algorithm that can perform a variety of natural language processing (NLP) tasks



3

MODEL SELECTION

Tradeoff between speed, accuracy and price.

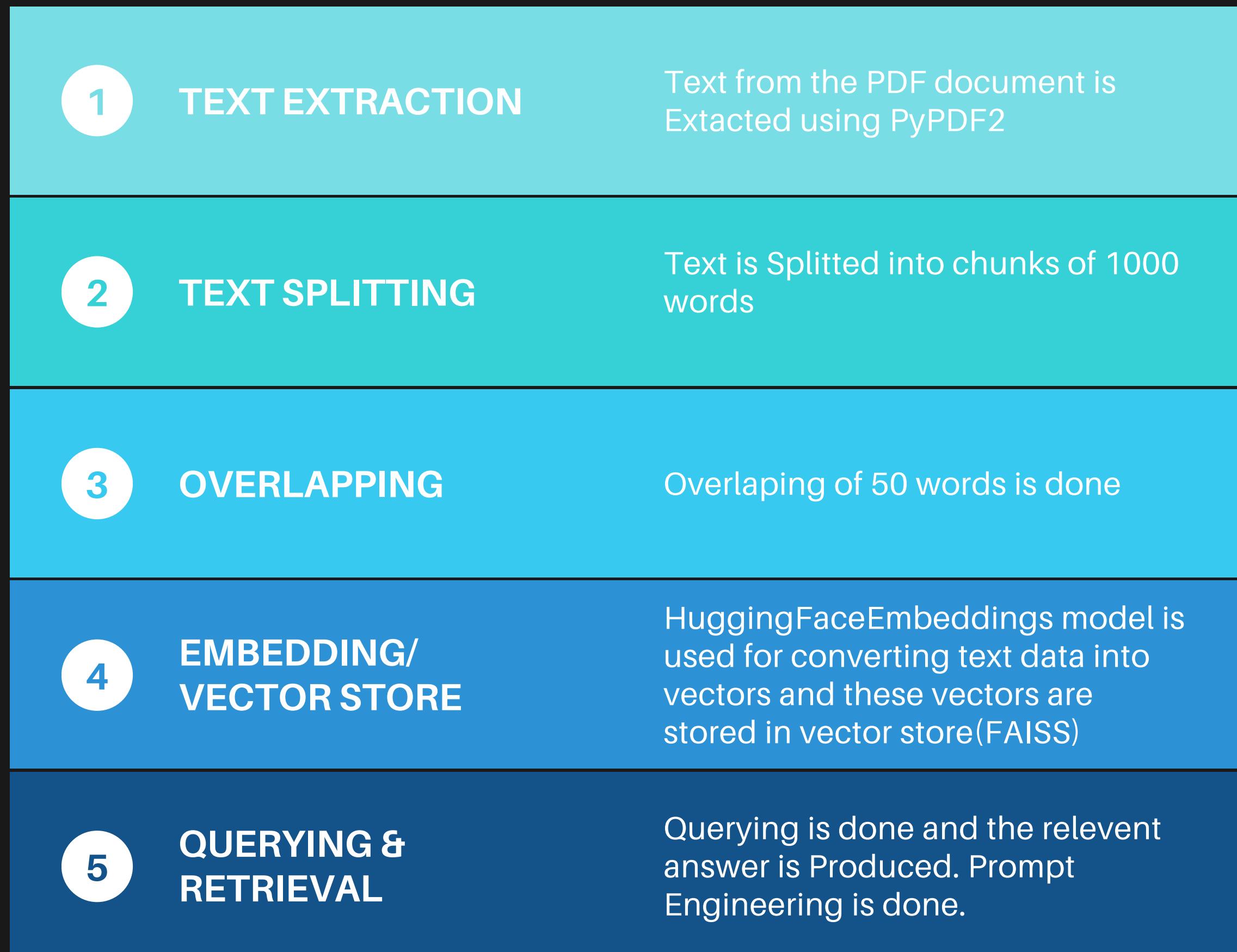


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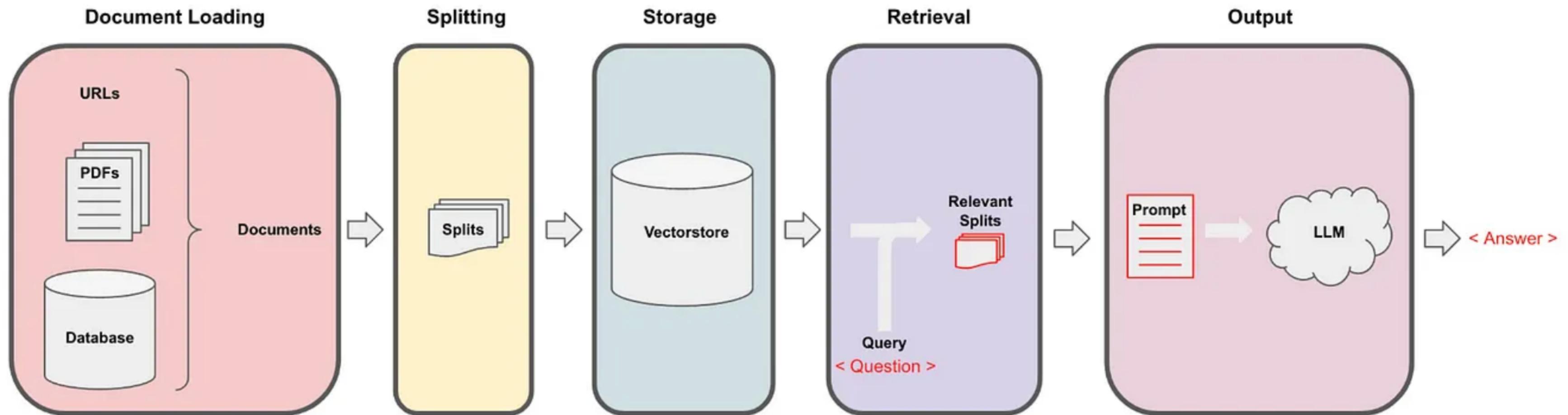
LANGCHAIN

LangChain is a framework to build application powered by language models.

Model Workflow



MODEL WORKFLOW FLOW DIAGRAM



OCR (OPTICAL CHARACTER RECOGNITION)

- Convert printed or handwritten text into a digital format.
- Use Pillow , Tesseract and OpenCV.

GRAYSCALE

KERNEL

INVERSION

DILATION

BLURRING

NOISE REMOVAL

THRESHOLD

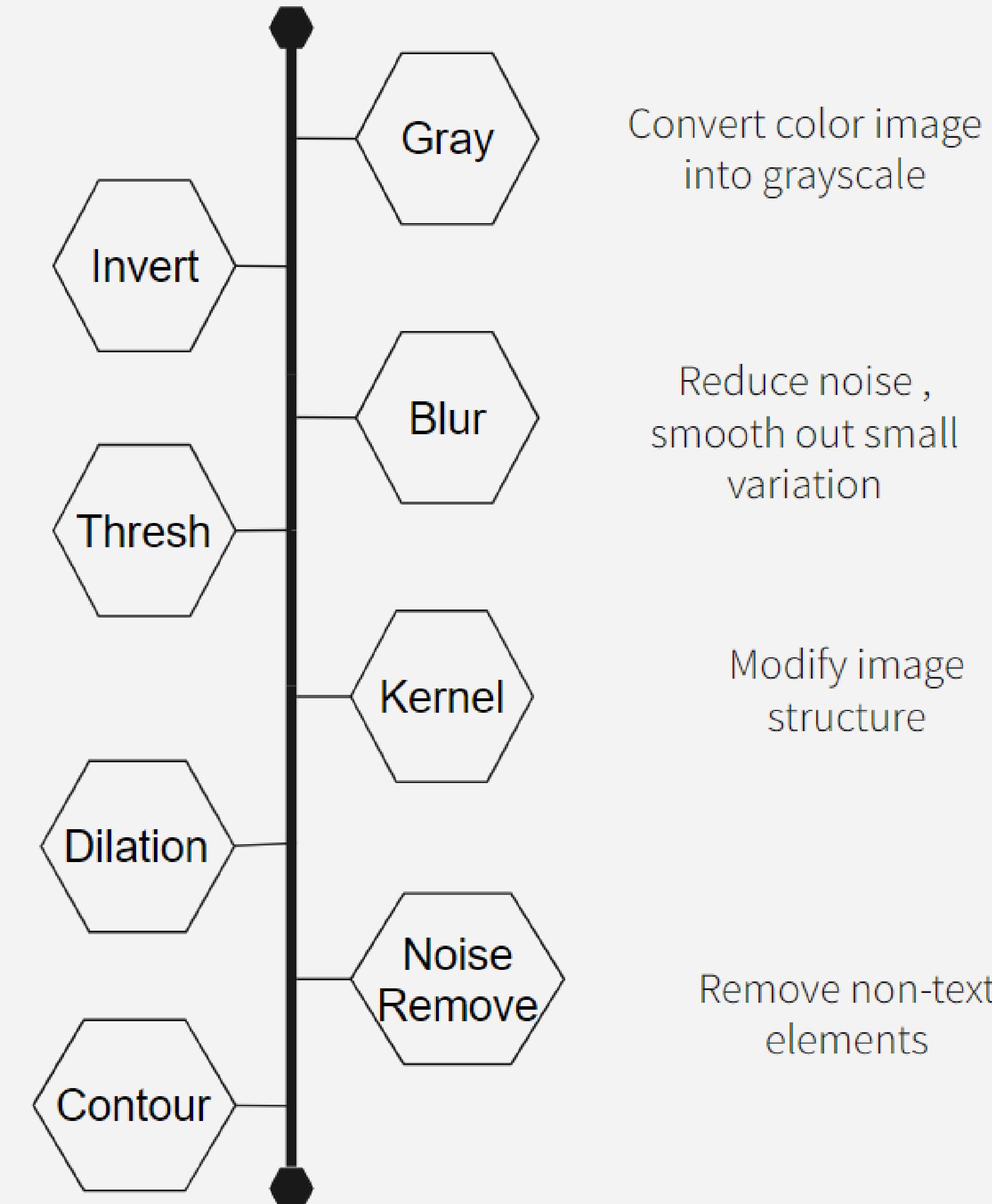
CONTOURS

Light text on a dark background.

Image into binary image

Enlarge text area , for contour detection

Find outlines of text regions, define shapes of individual text



Convert color image into grayscale

Reduce noise , smooth out small variation

Modify image structure

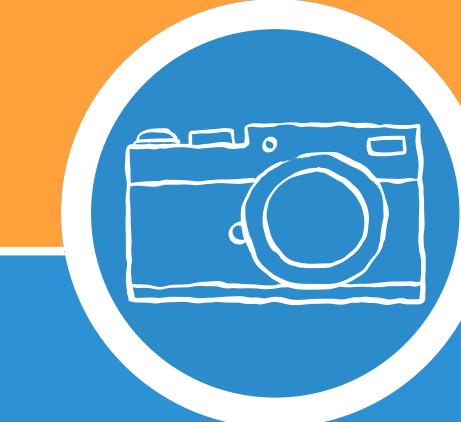
Remove non-text elements

WHY GO MOBILE?



ACCESS TO LARGER DEMOGRAPHIC

Everyone owns a mobile phone at this day and age, hence larger the reach.



INTEGRATED CAMERA

Sure you can click a picture and upload it to your desktop but why go through such a hassle



ACCESSIBLE ANYWHERE

Whip out your phone, scan for PDFs and ask questions on the go.

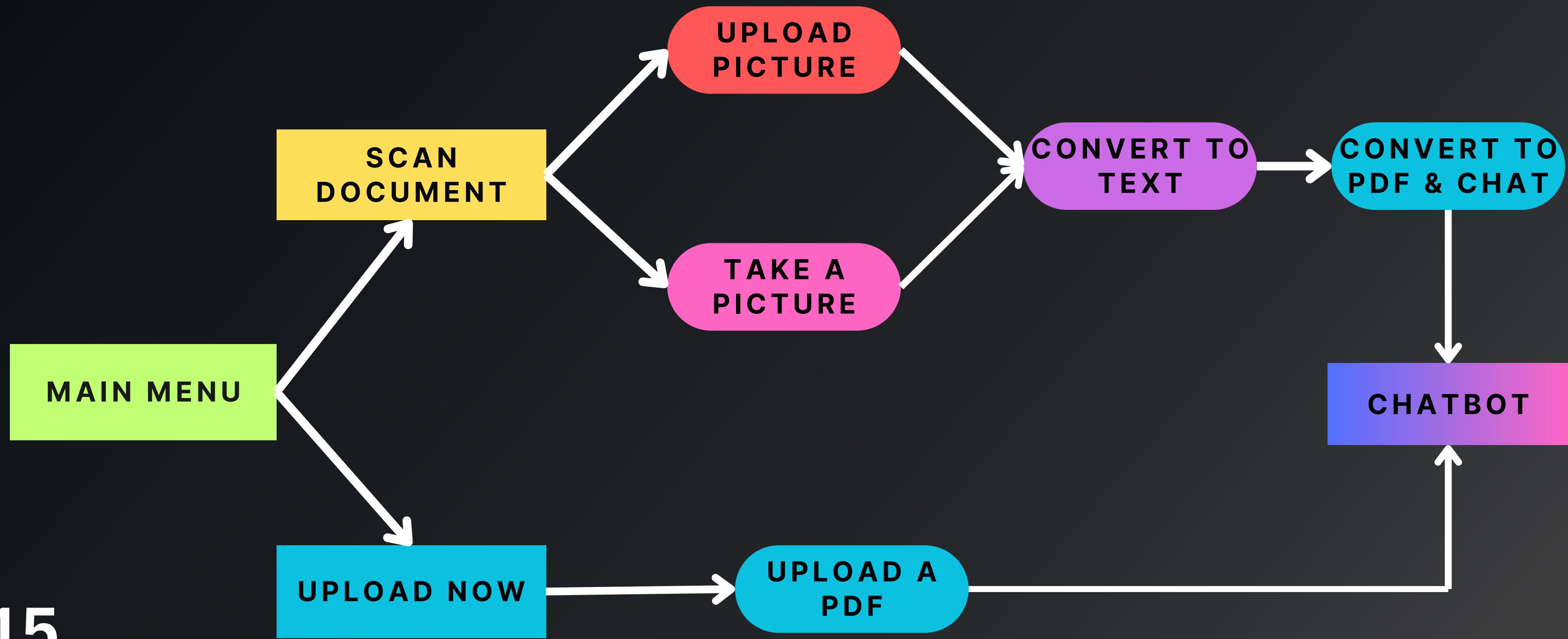
FLUTTER



- The frontend interface built using Flutter
- Provides better developer experience among alternatives
- Cross-platform: Supports web, android, iOS, and native desktop applications
- Provides out-of-the-box support for uploading PDF
- Integration of custom widget to build chatbot interface, saving a lot of time



FLUTTER APP FLOWCHART



FLASK

- It's a python module used to host python code as backend
- It provides Web Server Gateway Interface (WSGI) for connecting to a frontend
- Langchain and OCR are hosted using this interface
- Use of this module over others as it is extremely lightweight and easily integrable with flutter
- API calls are made using http calls



THANK YOU

LETS MOVE ON TO DEMO!