Pune Institute Of Computer Technology
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A Mini Project Report On

DocVision

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INTRODUCTION

MOTIVATION

Since the Government of India has banned some of the chinese apps like Camscanner there is a gap in industry. From this project we are trying to fill this gap. The motivation behind this app is to produce an application with the functionality of scanning and modifying PDFs.

Design And Implementation

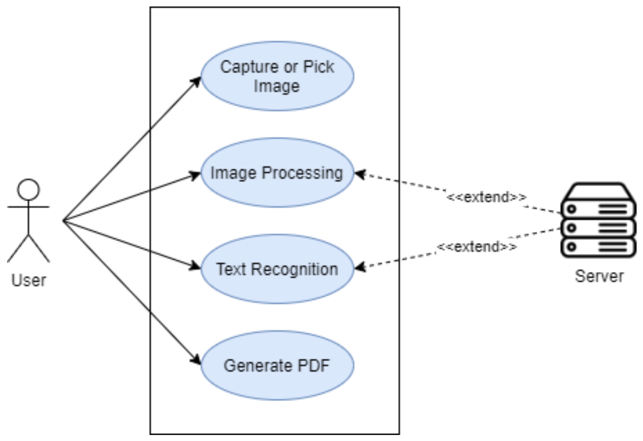
H/W AND S/W REQUIREMENTS

1. Hardware required:
    a. Computer with intel i5 and above processor
    b. 4GB system RAM or above
    c. Mobile phone with working camera
2. Software required:
    a. Android OS with API Level 24
3. APIs and Libraries:
    a. Design dependencies: ‘com.google.android.material:material:1.2.1’
    b. Networking dependencies: ‘com.squareup.retrofit2:retrofit:2.4.0’, ‘com.squareup.retrofit2:converter-gson:2.4.0’
    c. Pytesseract API, Flask API
    d. Deep Learning Libraries: Tensorflow, Keras, OpenCV
    e. Helper Libraries: Numpy, matplotlib

PROBLEM STATEMENT

To design an android app that provides the user to do some basic image processing, to let the user generate PDF from images.

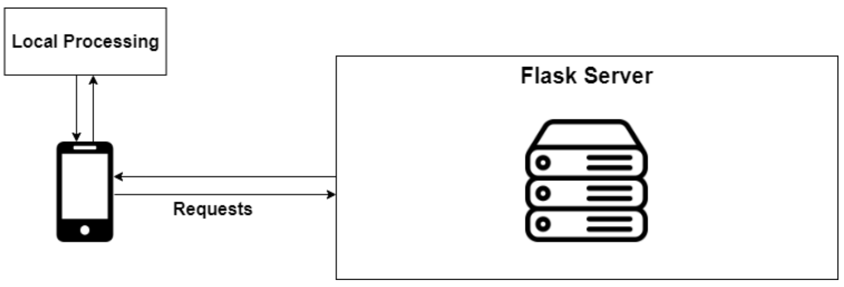
USE CASE DIAGRAM



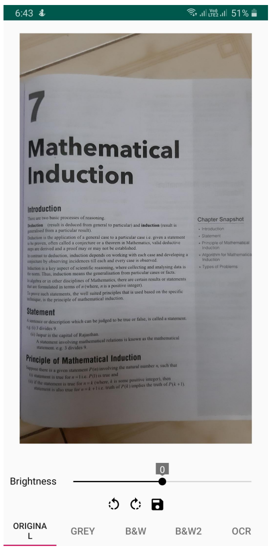
ALGORITHMS/API

1. Adaptive Thresholding [2]
2. Optical Character Recognition (OCR) [3]
3. Flask Server [4]

HIGH LEVEL DESIGN



SCREENSHOTS



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Mathematical Induction

Introduction

There are two basic processes of reasoning.

Deduction (result is deduced from general to particular) and **induction** (result is generalised from a particular result).

Deduction is the application of a general case to a particular case i.e. given a statement to be proven, often called a conjecture or a theorem in Mathematics, valid deductive steps are derived and a proof may or may not be established.

In contrast to deduction, induction depends on working with each case and developing a conjecture by observing incidences till each and every case is observed.

Induction is a key aspect of scientific reasoning, where collecting and analysing data is the norm. Thus, induction means the generalisation from particular cases or facts.

In algebra or in other disciplines of Mathematics, there are certain results or statements that are formulated in terms of n (where, n is a positive integer).

To prove such statements, the well suited principles that is used based on the specific technique, is the principle of mathematical induction.

Statement

A sentence or description which can be judged to be true or false, is called a statement.

e.g. (i) 3 divides 9.

(ii) Jaipur is the capital of Rajasthan.

A statement involving mathematical relations is known as the mathematical statement. e.g. 3 divides 9.

Principle of Mathematical Induction

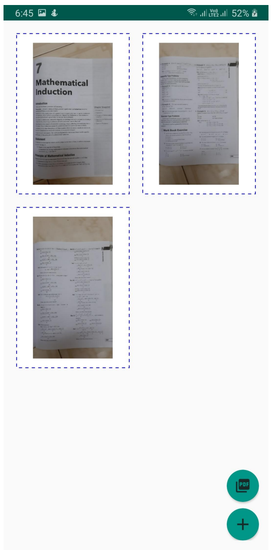
Suppose there is a given statement $P(n)$ involving the natural number n, such that

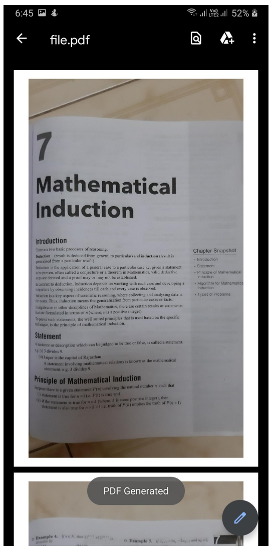
(i) statement is true for $n = 1$ i.e. $P(1)$ is true and

(ii) if the statement is true for $n = k$ (where, k is some positive integer), then statement is also true for $n = k + 1$ i.e. truth of $P(k)$ implies the truth of $P(k + 1)$.

Chapter Snapshot

- Introduction
- Statement
- Principle of Mathematical Induction
- Algorithm for Mathematica Induction
- Types of Problems





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Mathematical Induction

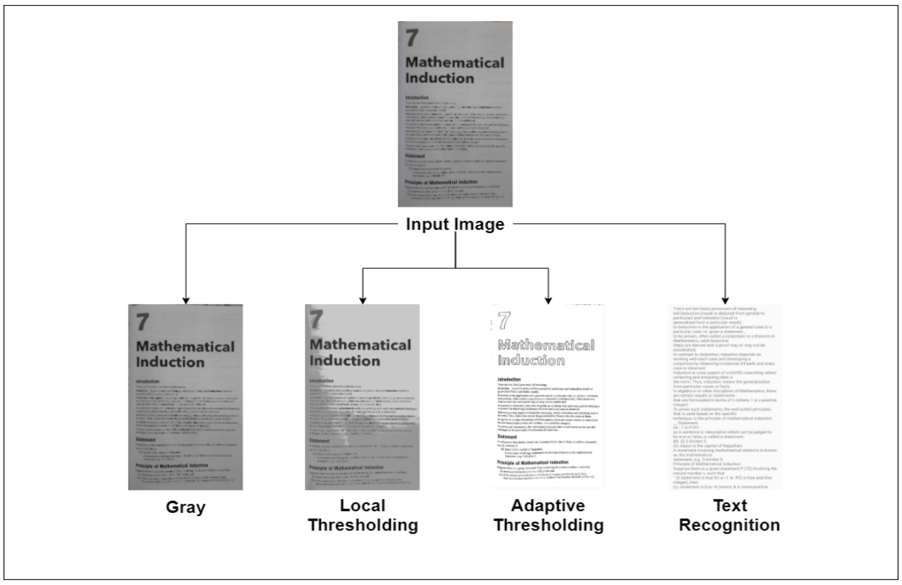
Introduction

Chapter Snapshot

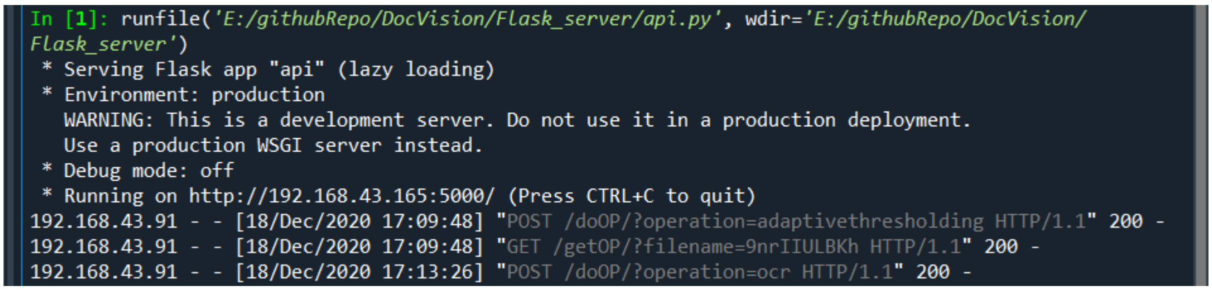
Statement

Principle of Mathematical Induction

RESULTS



API CALLS



```
In [1]: runfile('E:/githubRepo/DocVision/Flask_server/api.py', wdir='E:/githubRepo/DocVision/
Flask_server')
 * Serving Flask app "api" (lazy loading)
 * Environment: production
   WARNING: This is a development server. Do not use it in a production deployment.
   Use a production WSGI server instead.
 * Debug mode: off
 * Running on http://192.168.43.165:5000/ (Press CTRL+C to quit)
192.168.43.91 - - [18/Dec/2020 17:09:48] "POST /doOP/?operation=adaptivethresholding HTTP/1.1" 200 -
192.168.43.91 - - [18/Dec/2020 17:09:48] "GET /getOP/?filename=9nrIIULBKh HTTP/1.1" 200 -
192.168.43.91 - - [18/Dec/2020 17:13:26] "POST /doOP/?operation=ocr HTTP/1.1" 200 -
```

CONCLUSION

We have successfully implemented a DocVision app which will help to generate PDF from images. We have added some basic image processing like thresholding, color space conversions, etc. We have also added OCR(Optical Character Recognition) which will detect text from images. We have used TesseractOCR for the same. We have also built a FLASK server to do heavy work like recognizing text, dealing with larger image sizes.

FUTURE SCOPE

We will try to improve the app by more use of Machine Learning. We can add functionalities like recognizing languages, language conversion, recognizing tables and converting into csv, editing PDFs, we will try to improve accuracy of text recognition models, auto detecting documents and aligning perspective. We will try to make the server efficient to handle multiple requests at a time, we will improve privacy by adding encryption of every image going to the servers.

REFERENCES

[1] https://github.com/opencv/opencv

[2] https://github.com/tesseract-ocr/tesseract

[3] https://docs.opencv.org/master/d7/d4d/tutorial_py_thresholding.html

[4] https://flask.palletsprojects.com/en/1.1.x/