SUBJECT: Machine learning and Data Science	
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EXPERIMENT NO- 02

TITLE: ANN

AIM: To recognize optical character using ANN.

SOFTWARES:

SOFTWARE	VERSION
Jupyter Notebook	V5.1

THEORY:

We, humans, read text almost every minute of our life. Wouldn't it be great if our machines or systems could also read the text just like the way we do? But the bigger question is "How do we make our machines read"? This is where Optical Character Recognition (OCR) comes into the picture.

Optical Character Recognition (OCR) is a technique of reading or grabbing text from printed or scanned photos, handwritten images and convert them into a digital format that can be editable and searchable.

Applications:

OCR has plenty of applications in today's business. A few of them are listed below:

- Passport recognition in Airports
- Automation of Data Entry
- License plates recognition
- Extracting business card information into a contact list
- Converting handwritten documents into electronic images
- Creating Searchable PDFs
- Create audible files (text to audio)

Some of the Open Source OCR tools are Tesseract, OCRopus.

Here will focus on Tesseract OCR. And to read the images we need OpenCV.

INSTALLATION:

Installation of Tesseract OCR:

Download the latest installer for windows 10 from “https://github.com/UB-Mannheim/tesseract/wiki“. Execute the .exe file once it is downloaded.

Note: Don’t forget to copy the file software installation path. We will require it later as we need to add the path of the tesseract executable in the code if the directory of installation is different from the default.

The typical installation path in Windows systems is C:Program Files.

So, in my case, it is “C: Program FilesTesseract-OCRtesseract.exe“.

Next, to install the Python wrapper for Tesseract, open the command prompt and execute the command “pip install pytesseract“.

OpenCV:

OpenCV(Open Source Computer Vision) is an open-source library for computer vision, machine learning, and image processing applications.

OpenCV-Python is the Python API for OpenCV.

To install it, open the command prompt and execute the command “pip install opencv-python“.

Build sample OCR Script:

1. Reading a sample Image

```
import cv2

Read the image using cv2.imread() method and store it in a variable “img”.
img = cv2.imread("image.jpg")

If needed, resize the image using cv2.resize() method
img = cv2.resize(img, (400, 400))

Display the image using cv2.imshow() method
cv2.imshow("Image", img)

Display the window infinitely (to prevent the kernel from crashing)
cv2.waitKey(0)
```

Close all open windows
cv2.destroyAllWindows()

2. Converting Image to String

import pytesseract

Set the tesseract path in the code
pytesseract.pytesseract.tesseract_cmd=r'C:Program FilesTesseract-OCRtesseract.exe'

The below error occurs if we do not set the path.

```
TesseractNotFoundError: tesseract is not installed or it's not in
your PATH. See README file for more information.
```

To convert an image to string use pytesseract.image_to_string(img) and store it in a variable “text”

text = pytesseract.image_to_string(img)

print the result
print(text)

Complete code:

```
import cv2
import pytesseract
pytesseract.pytesseract.tesseract_cmd=r'C:Program FilesTesseract-OCRtesseract.exe'
img = cv2.imread("image.jpg")
img = cv2.resize(img, (400, 450))
cv2.imshow("Image", img)
text = pytesseract.image_to_string(img)
print(text)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

The output for the above code:

The output of the above code

CONCLUSION:

We studied ANN algorithm and implemented it for recognizing optical character.