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Into the World of Artificial Intelligence (AI)

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Contents

- What is AI?
- Why we use Python for AI?
- How can we use AI in python?
- Demo Project
- Home Assignments

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What is AI?

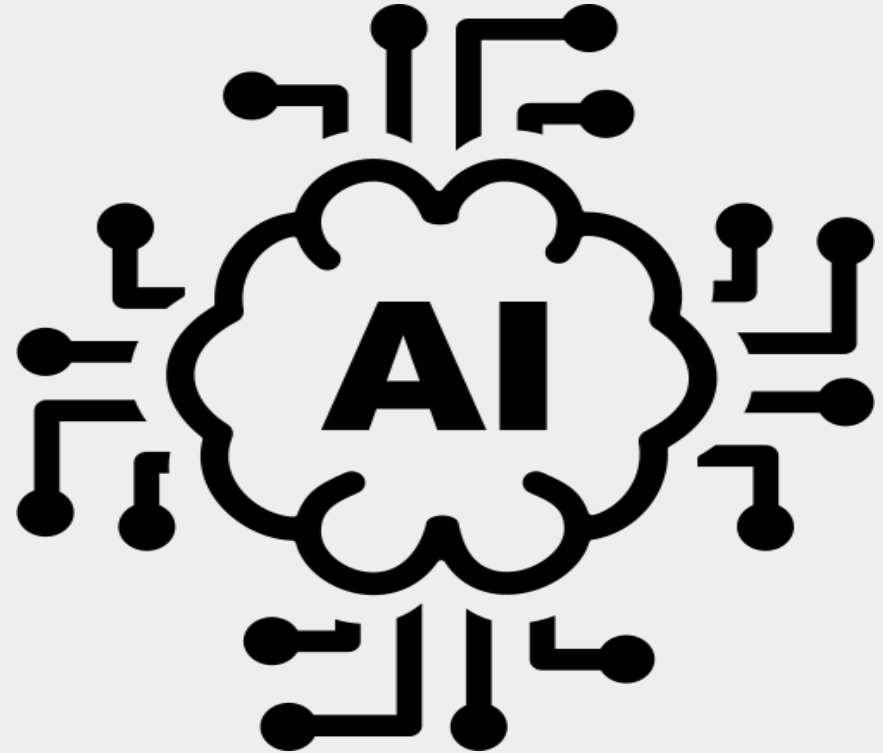


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Human



Artificial Intelligence



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Human can listen and
communicate



Speech
Recognition



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Human can read and write
in a language

read



write

Natural
Language
Processing



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Human see and learn it



Computer
Vision



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Human have neurons in
brain that help them to think



Neural Network
and Deep Learning



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**Human Learns from past
experience**



Machine Learning



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Why we use Python for AI?

There are so many inbuilt features in python that help you to reduce the line of codes



Less code

Support broad standard libraries that helps us to visualize the data



Pre-built libraries

Readable syntax of python make it easy to understand



Ease of learning

Python code can run on virtually all operating systems and **platforms**.



Platform Independent

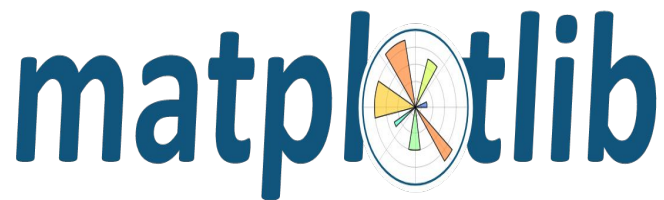
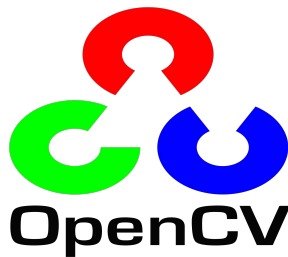


Massive Community Support

Million of developers actively work to improve it's functionality and streamline the process of python learning.

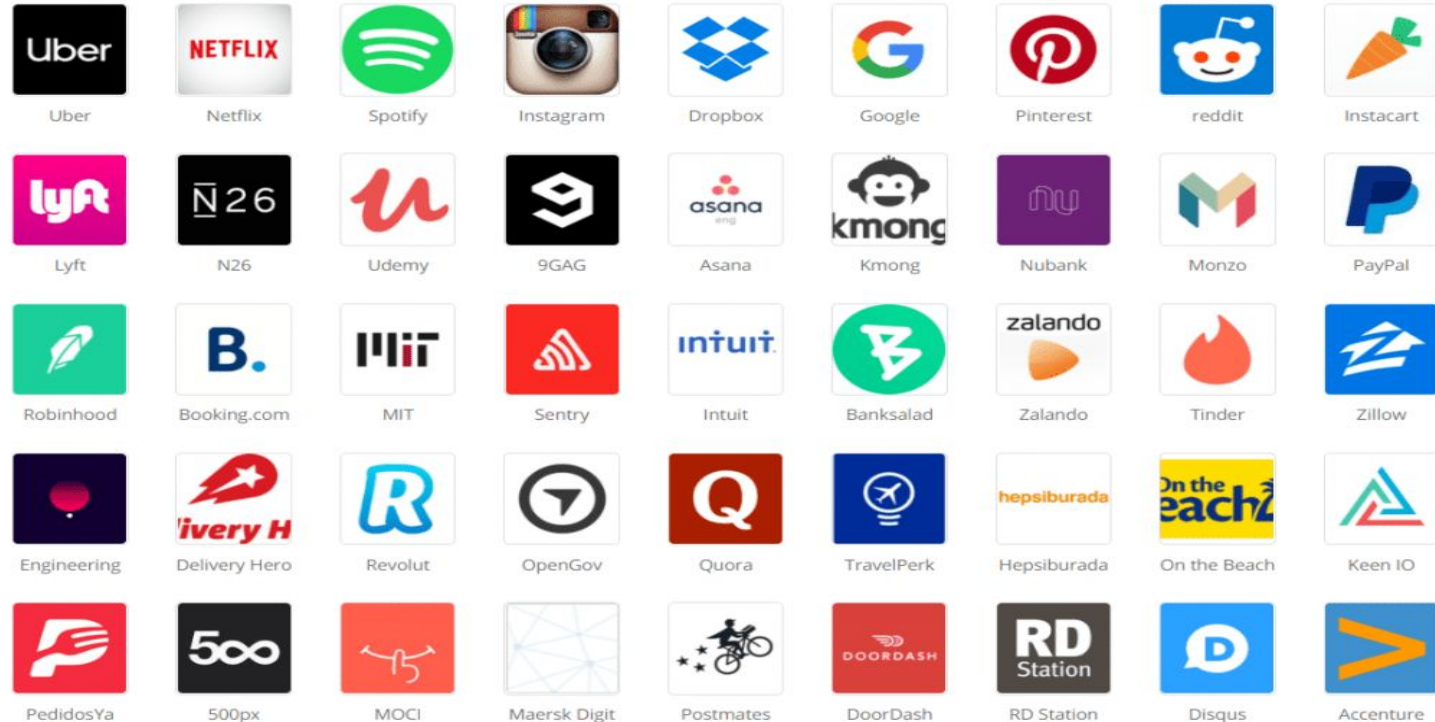
How can we use AI in python?

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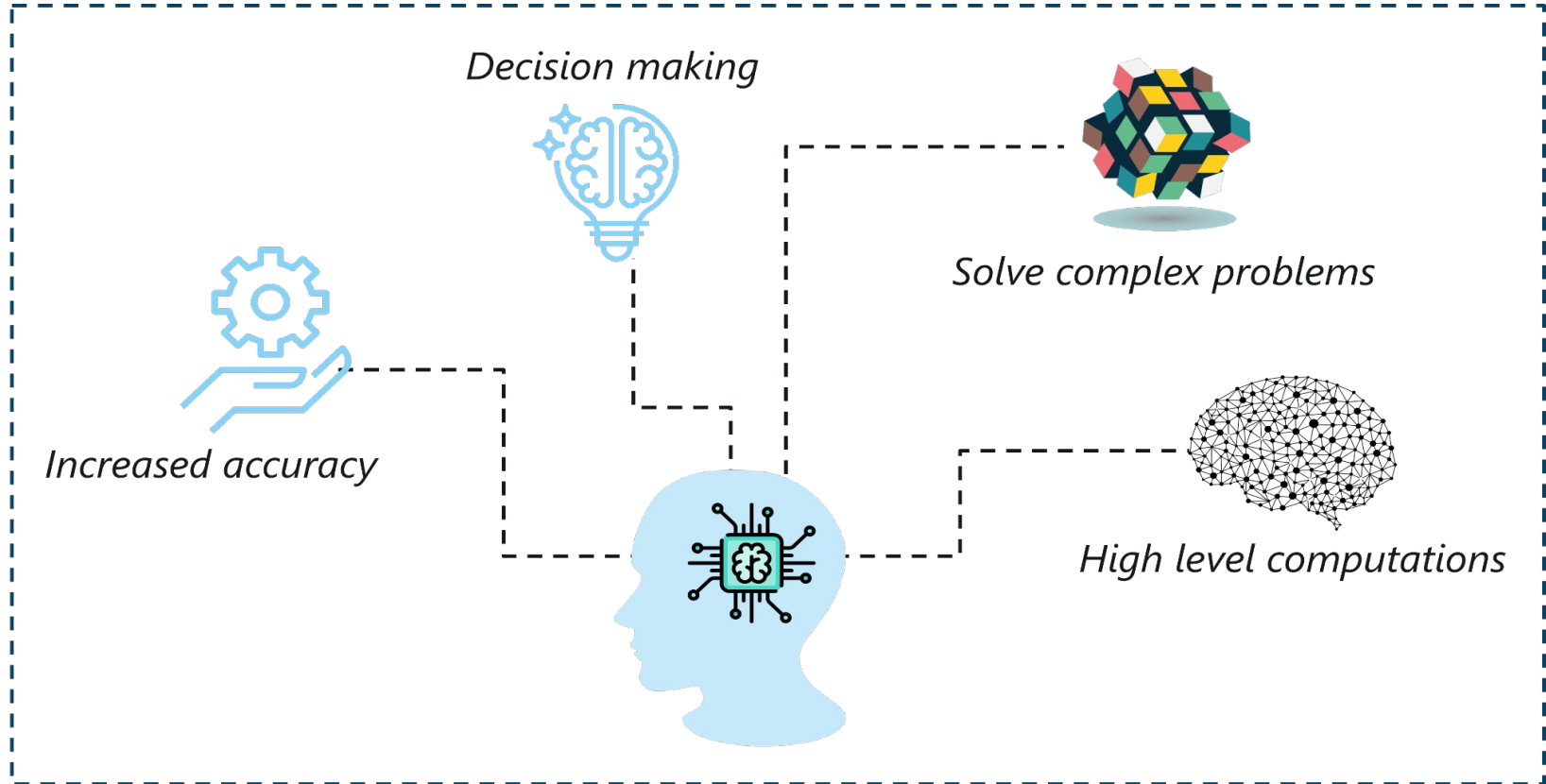
Which company uses Python?

6136 companies reportedly use Python in their tech stacks, including Uber, Netflix, and Spotify.



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AI is used for



Speech Recognition

The background is a solid teal color. On the right side, there is a faint, light-blue network diagram. It consists of several small circular nodes connected by thin, straight lines, forming a web-like structure that extends from the bottom right towards the top right.

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Applications of AI:- Speech recognition



Libraries need to install for text to speech conversion

Installation required

```
pip install pyttsx3
```

Here pyttsx3 library stands for Python Text to Speech Conversion Version 3 Library that helps to convert text into speech



Text to Speech Conversion Algorithm

Step 1

Text

Step 2

Preprocessing (Optional)

Step 3

Speech Synthesis

Step 4

Audio /Speech

Demo Project:-Speech Recognition(Text to Speech Conversion)

Make a virtual friend:-

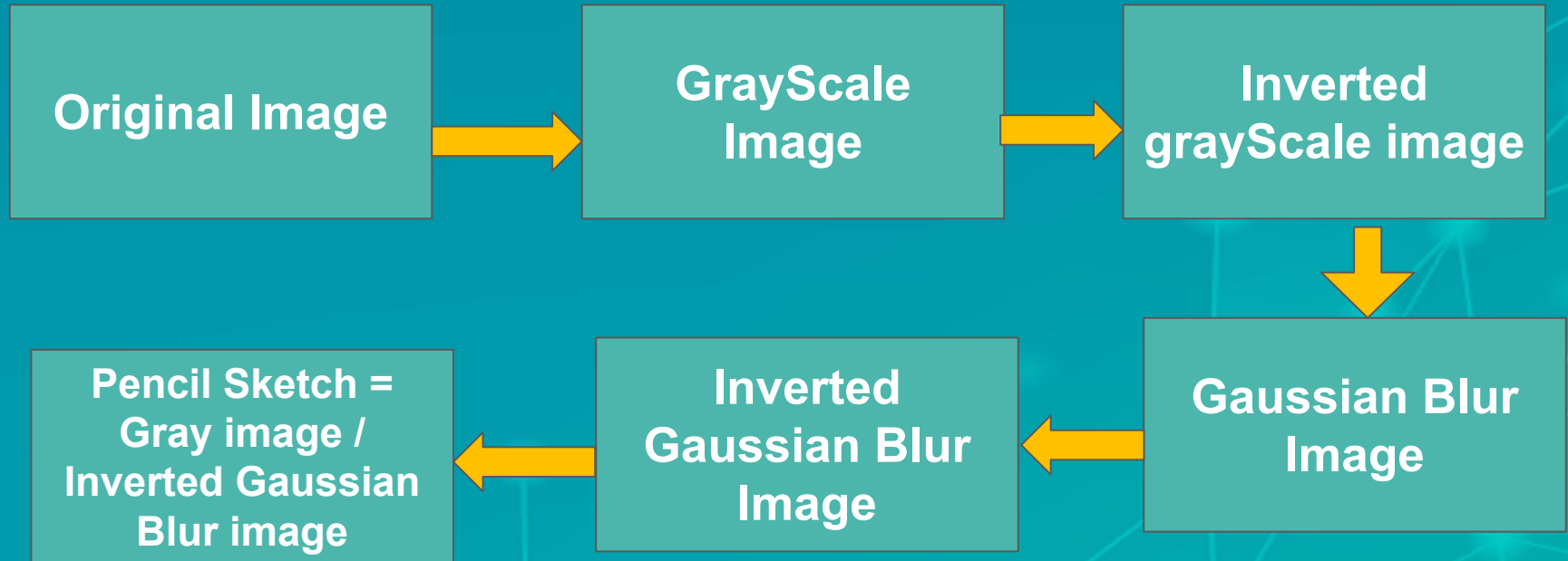
```
import pyttsx3  
friend=pyttsx3.init()  
friend.say('you are supercool')  
friend.runAndWait()
```

Make it more advanced

```
import pyttsx3  
friend=pyttsx3.init()  
speech=input('Enter something: ')  
friend.say(speech)  
friend.runAndWait()
```

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Demo Project : Pencil Sketch with Python



Libraries need to install for image processing

```
pip install opencv_python
```

```
pip install flask_ngrok
```

Clevered Demo Project:Pencil Sketch with Python

```
#Read the image

import cv2

#Import image

image = cv2.imread("dog.png")

#Show the image with matplotlib

cv2.imshow('original image',image)

cv2.waitKey(0)

cv2.destroyAllWindows()
```



Demo Project: Grayscale Image

```
#grayscale image

gray_image = cv2.cvtColor(image, cv2.COLOR_BGR2GRAY)

cv2.imshow('Gray Image',gray_image)

#Invert the new grayscale image

inverted_image = 255 - gray_image

cv2.imshow('Inverted',inverted_image)

cv2.waitKey(0)

cv2.destroyAllWindows()
```



Demo Project: Blurred Image

```
#Blurred the image
```

```
blurred = cv2.GaussianBlur(inverted_image, (21, 21), 0)
```

```
#Invert the blurred image:-
```

```
inverted_blurred = 255 - blurred
```

```
pencil_sketch = cv2.divide(gray_image, inverted_blurred, scale=255.0)
```

```
cv2.imshow('Sketch',pencil_sketch)
```

```
cv2.waitKey(0)
```

```
cv2.destroyAllWindows()
```



Original Image



Sketch using python



Note:-Those who are not using colab are requested to use `cv2.imshow()` to show the image whose syntax is `cv2.imshow('image' , image)` and `cv2.waitKey(0)` to hold screen and `cv2.destroyAllWindows()`

Home-Assignment -I

Task:-Write a code in which you have to implement speech to text conversion part of Speech Recognition.

Libraries needed for Speech to text Conversion:-

pip install SpeechRecognition

pip install pyaudio

Please check this video if pyaudio is not working for you:-

https://www.youtube.com/watch?v=-3am_5jMzJ4

Code for reference for implementing speech to text conversion part:-

<https://www.geeksforgeeks.org/python-convert-speech-to-text-and-text-to-speech/>

Speech to Text Conversion Algorithm (For Guidance)



Step 1

Audio/Speech

Step 2

Take input from Microphone

Step 3

Speech Recognition

Step 4

Text

Home-Assignment -II

Task:-Make an audio book that reads any pdf file for you.

Libraries needed for Speech to text Conversion:-

```
pip install pyttsx3
```

```
pip install PyPDF2
```

```
from PyPDF2 import PdfFileReader
```

Open pdf :- book=open('pdf_name.pdf' , 'rb')

Reading book:- reader=PdfFileReader(book)

Check Number of Pages:-pages=pdfReader.numPages

```
print(pages)
```

Get page number that you want to read:-page =pdfReader.getPage(7)

Extract Text from page:-text = page.extractText()

Home-Assignment -III

Task:-Make a portrait by using opencv library like we learned for pencil sketch program in python.

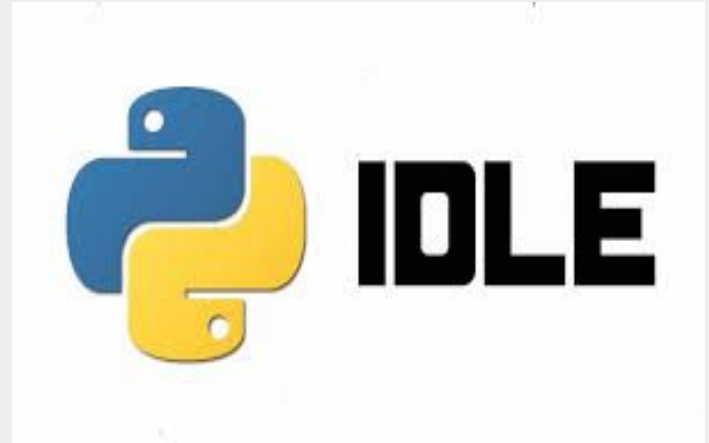
Also please write few lines why did you choose that particular photograph to make portrait.

Library needed:-

```
pip install opencv_python
```

Home-Assignment - IV

State the difference between IDE and IDLE



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Home Assignment - IV

Write your understanding by seeing below picture



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Next Steps



- Complete Demo Codes of session
- Complete home assignments and submit all in PPT Format till Friday 12:00 PM noon IST
- Review in first 15 minutes of your work
- Email questions/ suggestions if any

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Communication



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Thank you