# OPERATING SYSTEM PROJECT FILE

## CBCPC09


## Innovate E-Commerce

**Submitted To :-**

Ms. Saumiya Ma'am

**Submitted By:-**

Hasan Usmani 2020UEA6561
Yash Joon 2020UEA3566
Gaurav Tiwari 2020UEA6610
Nikhil Vashisht 2020UEA6594

# Table of Content

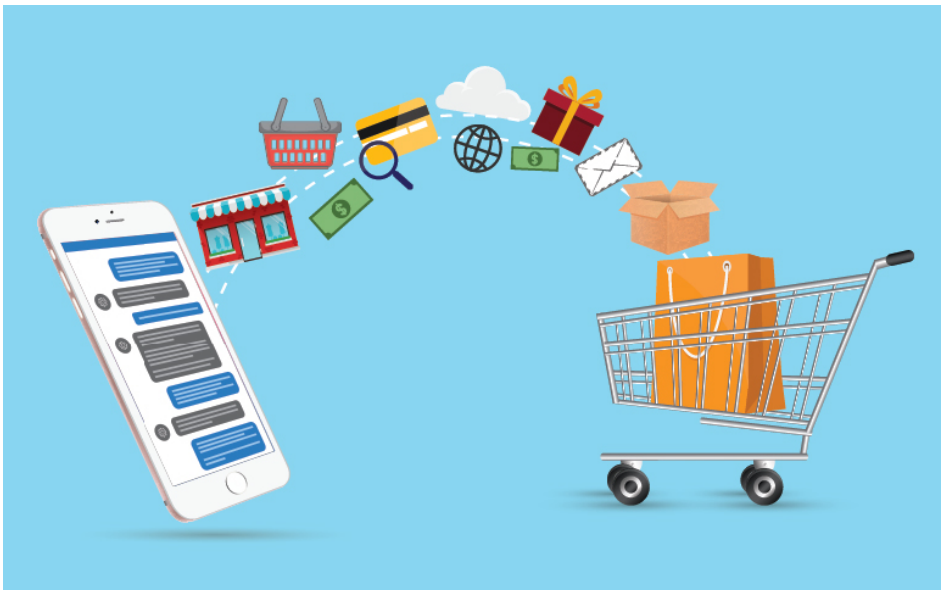
# Chapter 1

# INTRODUCTION:

A new approach, idea, product, etc. that results in the introduction of new goods or services, boosts productivity, or simplifies several operations is referred to as an innovation. Innovation in e-commerce also refers to the application of fresh concepts, procedures, goods, or services to solve problems, increase revenue, or improve productivity.
The e-commerce industry is expanding and changing quickly, and new trends and technologies are constantly being developed. E-commerce companies are under increasing pressure to remain competitive and provide cutting-edge solutions that can draw in and keep customers as consumers turn more and more to online shopping for convenience, affordability, and variety.

The e-commerce experience for customers can be enhanced by a number of innovative technologies. Some of the most promising ones are listed below:

**Artificial intelligence (AI)** : Customers may browse items, get answers to their concerns, and receive personalized suggestions based on their browsing history and preferences with the use of chatbots and virtual assistants powered by AI. AI can also be employed to detect fraud, personalize promotions, and improve pricing.



**Augmented reality (AR):** AR technology can allow customers to visualize products in a real-world environment, helping them to make more informed purchase decisions. For example, customers can use AR to see how furniture would look in their home or how clothes would fit on their body.

**Virtual reality (VR):** VR technology can create immersive shopping experiences, allowing customers to browse products and explore stores in a virtual environment. This can be especially useful for online retailers who want to recreate the in-store experience and build stronger brand connections with customers.

**Blockchain:** Blockchain technology can help to improve the security and transparency of e-commerce transactions, reducing the risk of fraud and increasing trust between buyers and sellers. It can also be used to create loyalty programs and incentivize customer engagement.

**Voice commerce:** Voice assistants like Amazon Alexa and Google Assistant can be integrated into e-commerce platforms, allowing customers to make purchases with their voice. This can make the shopping process faster and more convenient, especially for customers who are multitasking or have disabilities.

These are just a few examples of the new technologies that can be used to improve the e-commerce experience for customers. By leveraging these technologies, e-commerce businesses can create more personalized, engaging, and convenient shopping experiences that meet the evolving needs and expectations of modern consumers.

As part of this project we will only explore  two such technologies:

**1- Augmented Reality**

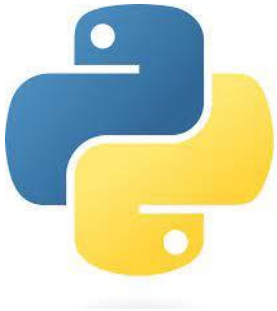
**2- Artificial Intelligence**

# Tech Stack:

- Keras
- Flask
- Kotlin
- Java
- Python
- Numpy
- pandas
- Tensorflow
- Unity
- HTML

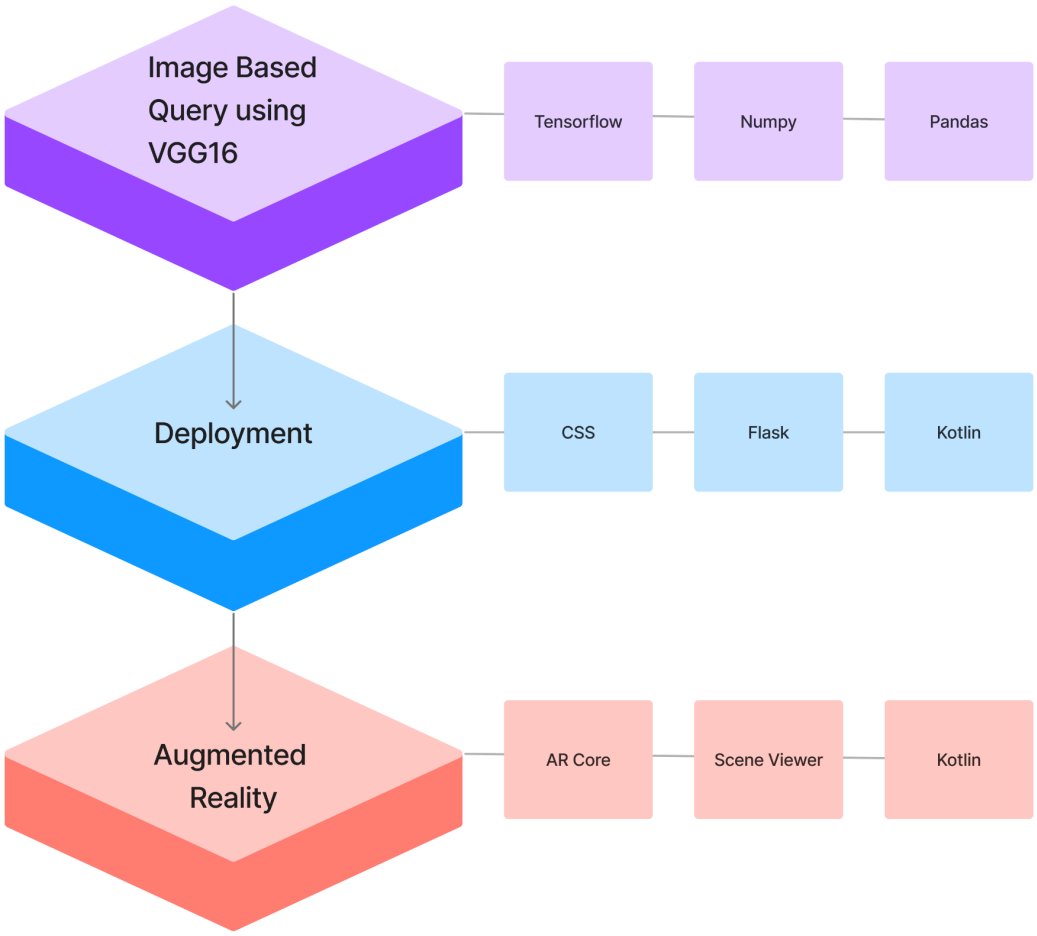






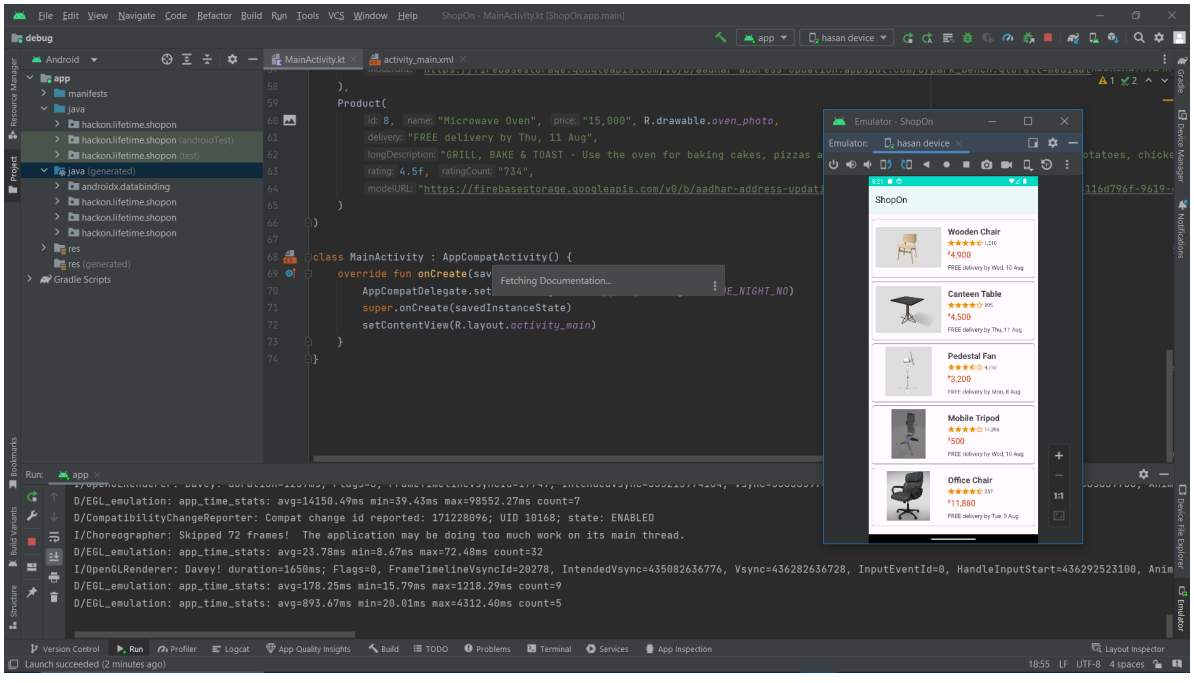


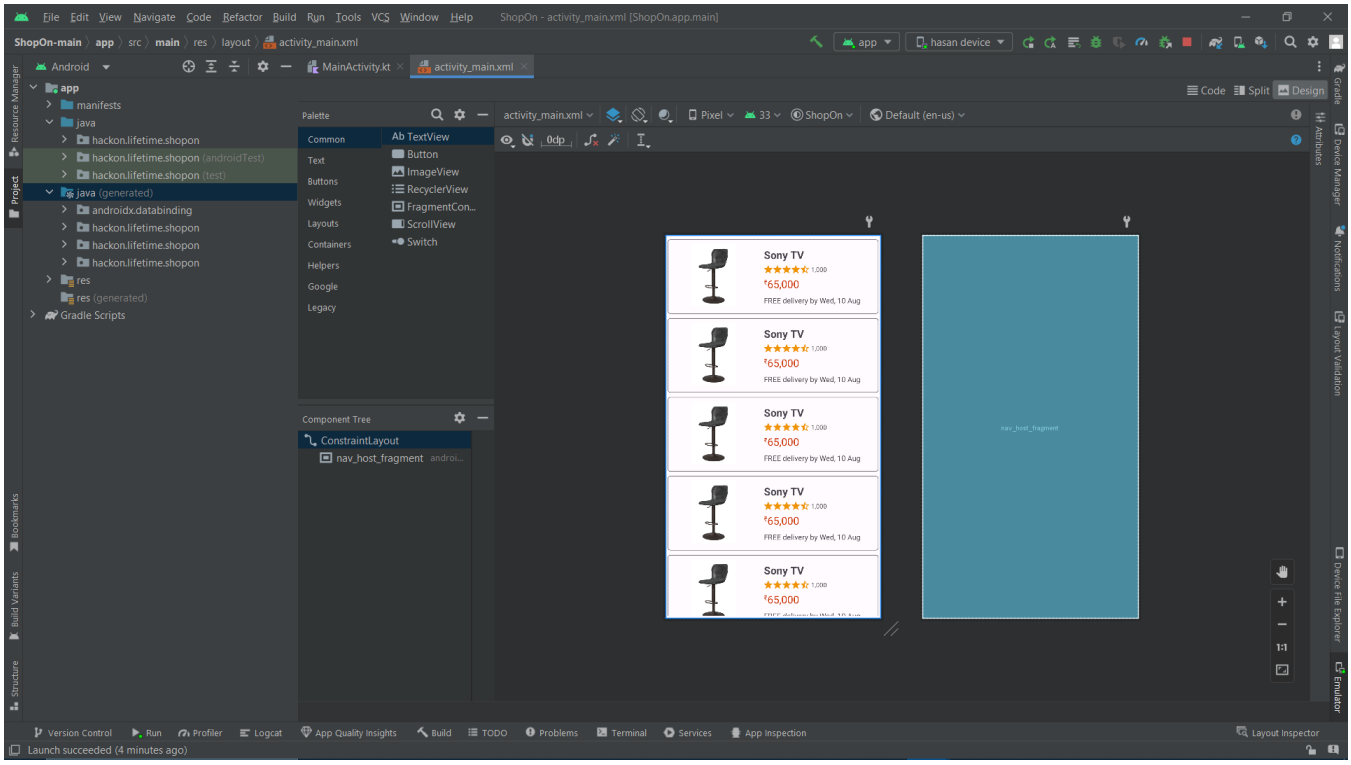

# PROPOSED METHODOLOGY



# Shopping App prototype:

Customers are reluctant to make online purchases since they cannot physically inspect the products to confirm their sizes. The basic distinction between online and traditional buying is the inability to physically scrutinize the merchandise. We could encourage more people to buy things online, including those who have previously been hesitant to do so, if we can solve the problem of product trials by enabling buyers to review the product dimensions and compare them to actual objects.




File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
ShopOn - activity_main.xml [ShopOn.app.main]
ShopOn-main app src main res layout activity_main.xml
app
hasan device
Android
MainActivity.kt
activity_main.xml
Code Split Design
Palette
Common
Text
Buttons
Widgets
Layouts
Containers
Helpers
Google
Legacy
Ab TextView
Button
ImageView
RecyclerView
FragmentCon...
ScrollView
Switch
activity_main.xml
Pixel
33
ShopOn
Default (en-us)
Component Tree
ConstraintLayout
nav_host_fragment
Sony TV
₹65,000
FREE delivery by Wed, 10 Aug
nav_host_fragment
Version Control
Run
Profiler
Logcat
App Quality Insights
Build
TODO
Problems
Terminal
Services
App Inspection
Layout Inspector
Launch succeeded (4 minutes ago)

**How does it function?**

By sending an explicit purpose to SceneViewer, we'll use it. Our Android app's Scene Viewer is an immersive viewer that enables 3D and augmented reality experiences. It makes it simple for users of our programme to preview, place, view, and interact with 3D models that are hosted online. It makes use of Google's technology for creating augmented reality experiences, called ARCore. Our application can sense its surroundings, comprehend the outside world, and interact with information thanks to ARCore and a variety of APIs.

To combine virtual material with the real world as seen through your phone's camera, ARCore makes use of three crucial capabilities:

The phone can comprehend and track its position in relation to the outside world thanks to motion tracking.

Using environmental awareness, the phone can gauge the size and

The phone can assess the amount of light present in the surrounding area.

**How rapidly can this technology be put into use?**

The current shopping applications for various products make it possible to implement the solution right away.

**What effect does this solution have?**

The addition of this function will have a significant impact because it closes the distance between our customers and the actual product. As more individuals became eager to test the product, sales would finally rise significantly.

**Is the remedy expandable?**

The fact that the solution can be used with the current ecommerce applications makes it very scalable.

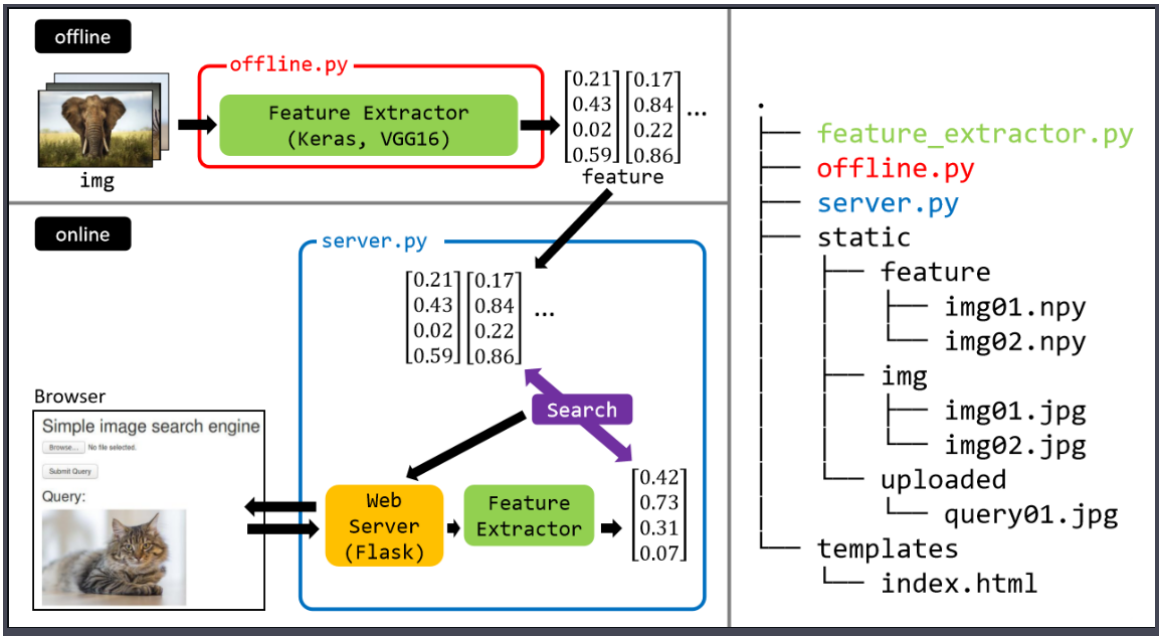
Commercial Relevance:

Once the concept is put into practise, more and more customers will be enticed to look at the products and will be able to try before buying it increasing the enthusiasm for e-commerce.

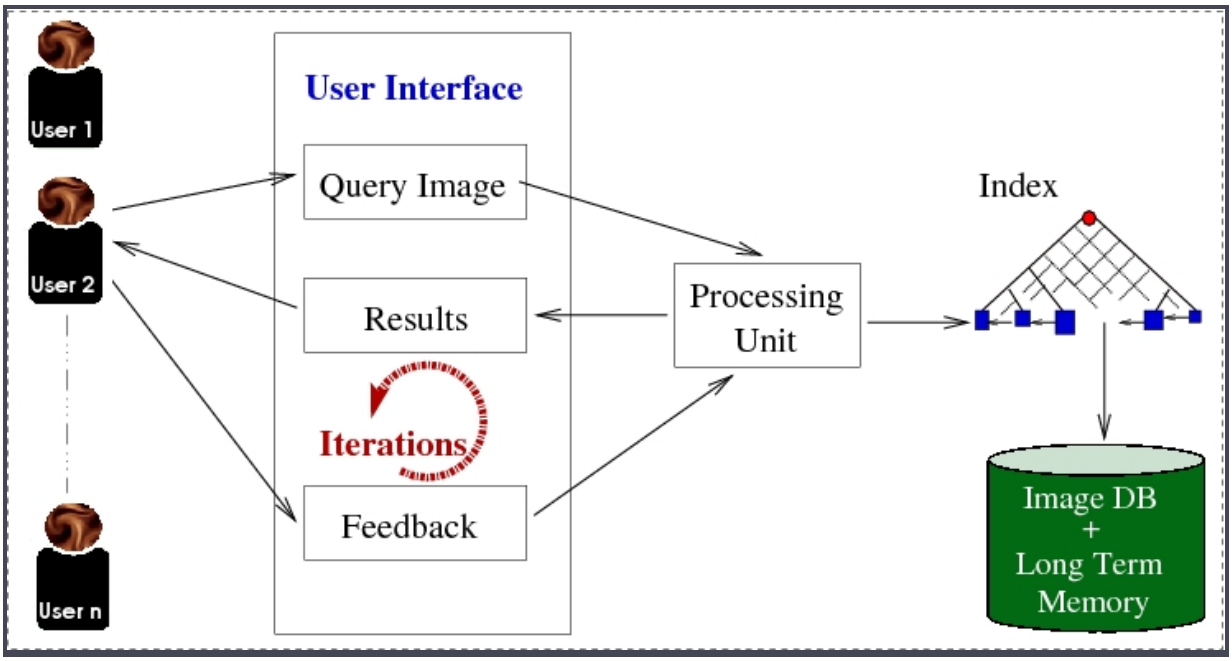
# Chapter 2

# Image based query Search:

Finding items in picture databases that are pertinent to a user query is known as "image querying" (Image DBs). The traditional approaches to solving this issue include the content-based method, also known as content-based image retrieval (CBIR), where the picture content is represented by low-level features, and the semantic-based approach, where an image is represented by metadata (for example, keywords) (e.g., color and texture). While the picture querying problem becomes an information retrieval problem with the semantic-based method, more advanced query assessment techniques are needed for CBIR.

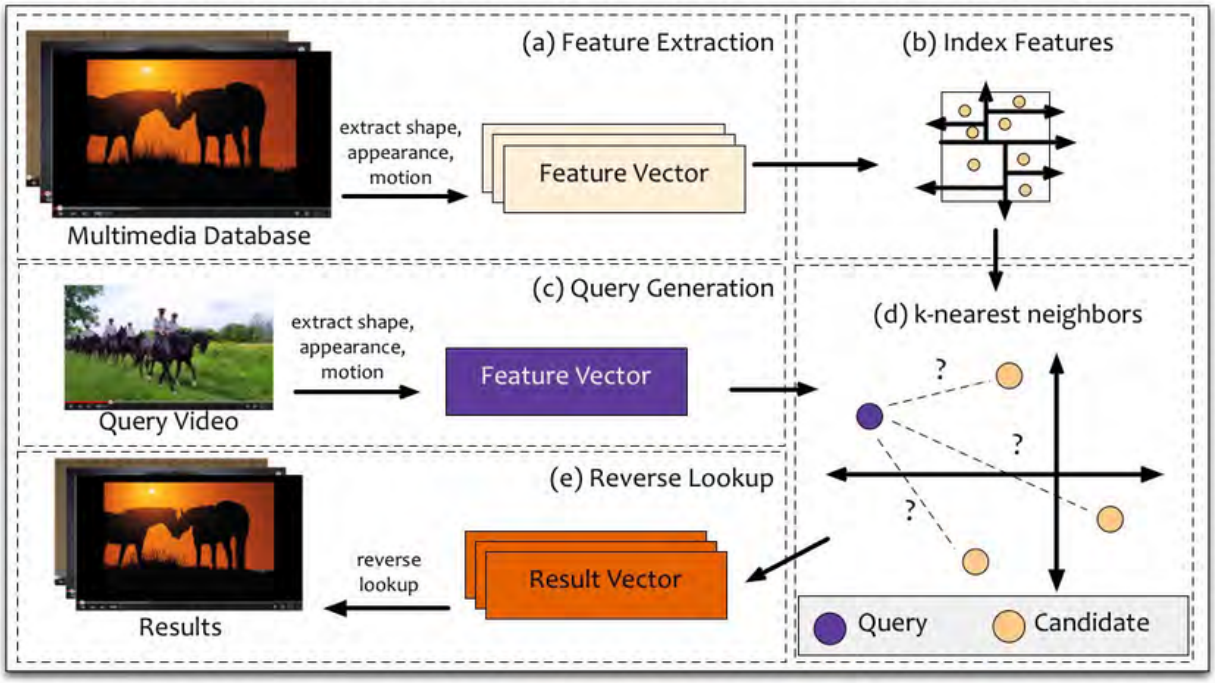


A new technology that has the potential to completely transform the e-commerce sector is image-based query search. Text-based queries, which can be time-consuming and may not fully capture what the client is looking for, have traditionally been the mainstay of e-commerce searches. Contrarily, image-based search enables users to upload a picture and identify related products based on visual cues like color, shape, and texture.
By streamlining the search process and enhancing the precision of product recommendations, this technology can significantly improve the user experience. A buyer could, for instance, use a photo of a dress they saw on the street to find equivalent outfits on an e-commerce website. This removes the requirement for the customer to verbally explain the outfit, which can be




By enhancing the shopping experience and boosting user engagement, image-based search has the potential to boost conversion rates as well. E-commerce companies may provide a more engaging and immersive shopping experience that better suits the requirements and preferences of contemporary consumers by enabling shoppers to browse products based on visual clues.

Implementing image-based search, however, can be difficult since accurate identification and classification of visual elements need sophisticated machine learning and computer vision algorithms. To guarantee that image-based search is dependable, accurate, and user-friendly, e-commerce companies will need to make the appropriate investments in technology and expertise. Despite these difficulties, image-based search has substantial potential advantages and is probably going to play a bigger role in e-commerce in the years to come.




# ML model :

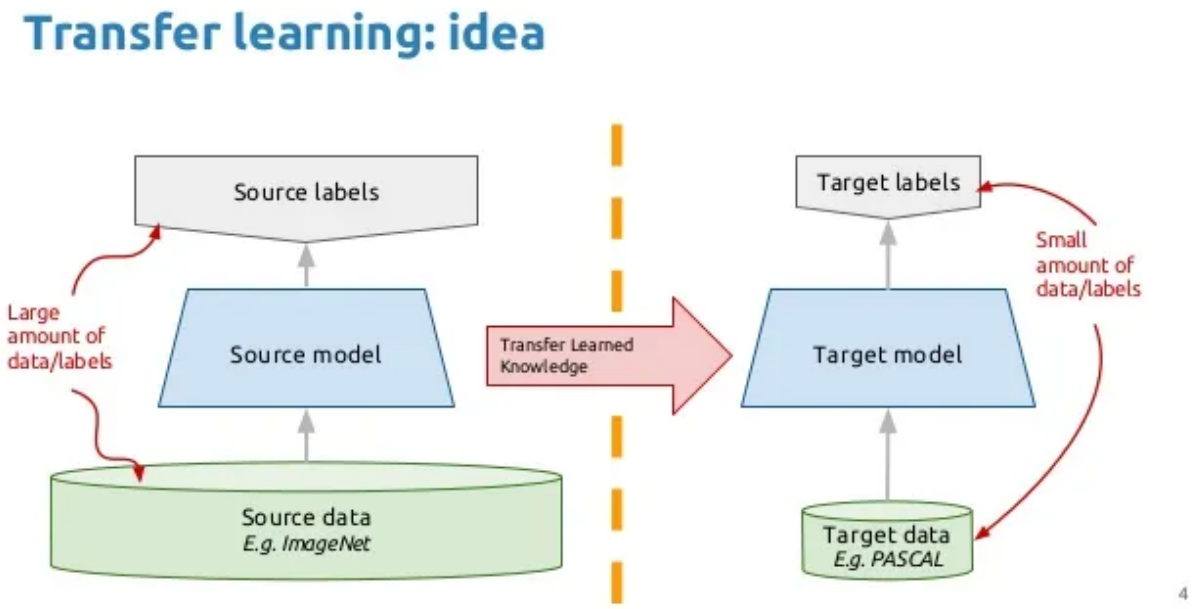
## Transfer learning

**Transfer learning in machine learning refers to applying a previously learned model to a new issue. We used a pre-trained CNN model to implement transfer learning in our project (VGG-16).**

Transfer learning's fundamental tenet is straightforward: take a model that has been trained on a sizable dataset and apply its knowledge to a smaller

dataset. Using a CNN, we only train the final few layers that produce predictions for object recognition and freeze the network's early convolutional layers. The concept is that the convolutional layers extract universal, low-level properties that apply to all images, such as edges, patterns, and gradients, while the subsequent layers recognise particular aspects within an image, such as eyes or wheels.

There are therefore common, low-level properties that are shared by all photos, allowing us to leverage a network that was trained on unrelated categories in a large dataset (often Imagenet) to solve our own issue. Given how similar the photos in the Caltech 101 dataset are to those in the Imagenet dataset, a model trained on Imagenet should have little trouble doing this task.



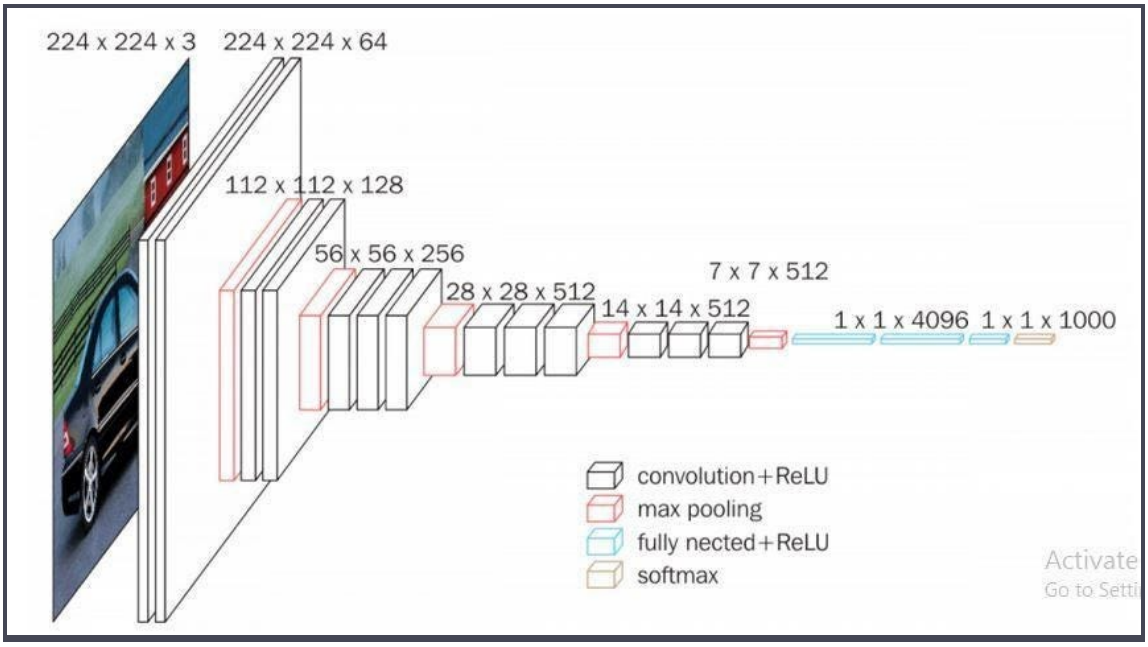

## VGG-16.

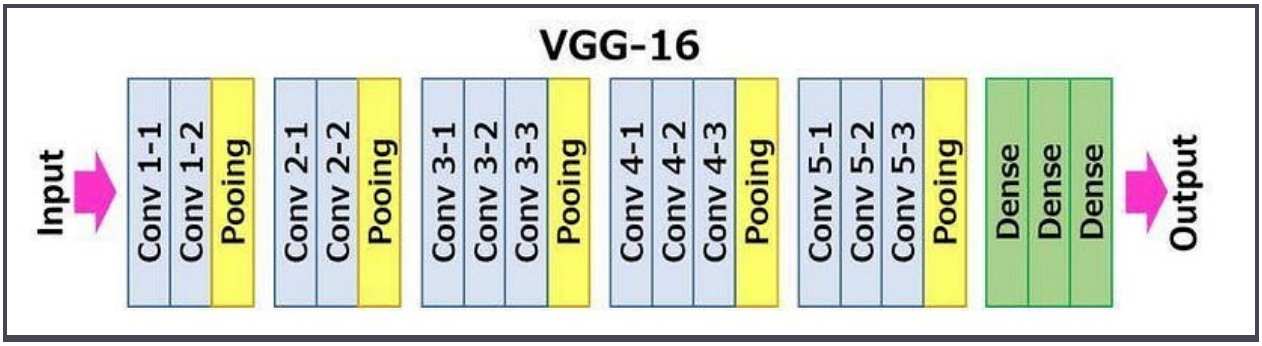
The neural network used for this project is VGG-16.

A ConvNet is another name for a convolutional neural network, which is a type of artificial neural network. An input layer, an output layer, and many hidden layers make up a convolutional neural network. One of the top computer vision models to date is the CNN (Convolutional Neural Network) variant known as VGG16. This model's developers analyzed the networks and enhanced the depth using an architecture with incredibly tiny (3 3)

convolution filters, which demonstrated a notable advancement over the state-of-the-art setups. The depth was increased to 16–19 weight layers, yielding around 138 trainable parameters.

VGG16 is an object identification and classification method that has a 92.7% accuracy rate when classifying 1000 photos into 1000 different categories. It is a well-liked technique for classifying images and is simple to employ with transfer learning.



# Web Application:

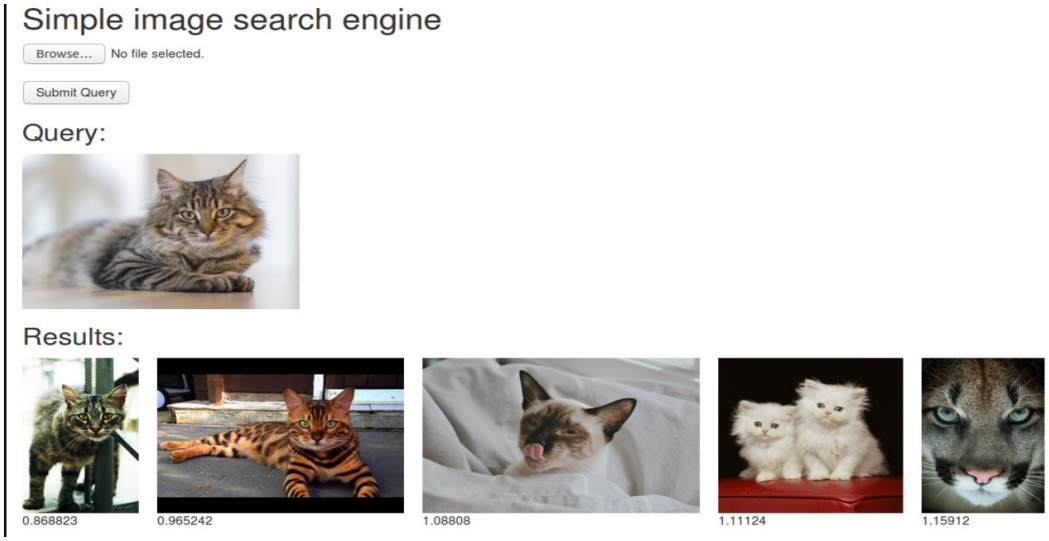
To deploy our project on web, we have used following technologies:

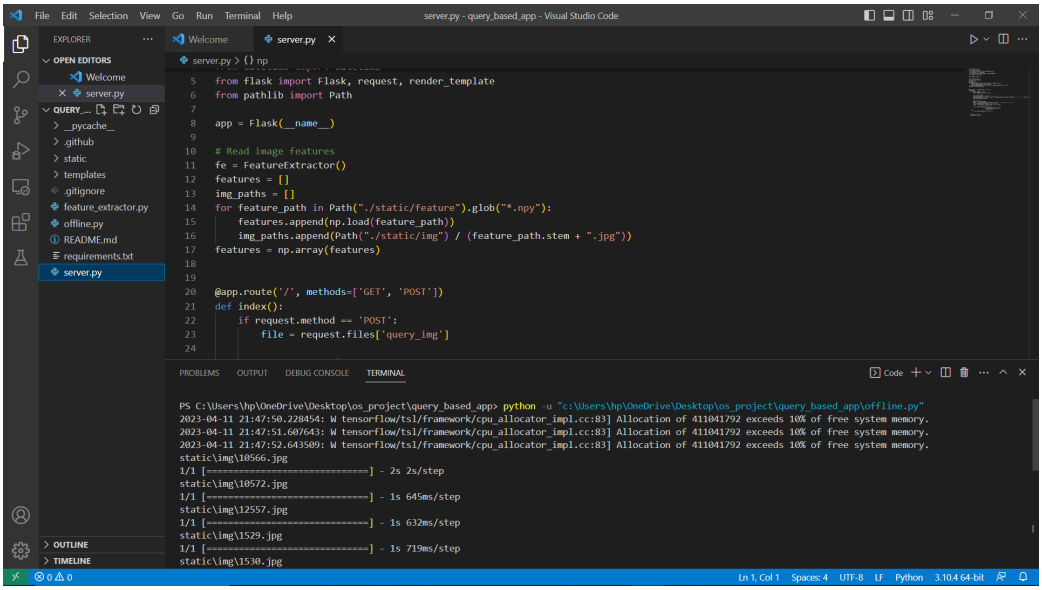
**Flask:-** A backend framework called Flask is used to create web apps. A framework serves as the building block for creating applications and includes a number of built-in modules and libraries to facilitate the development process. It offers a framework for programmers to adhere to when building a web application

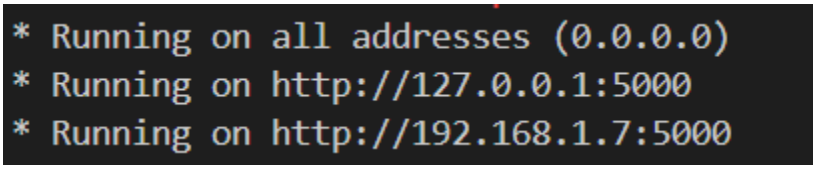
**Python-** .First published in 1991, Python is a high-level, interpreted, object-oriented programming language. It is one of the most widely used programming languages in the world because of its readability, simplicity, and ease of use.

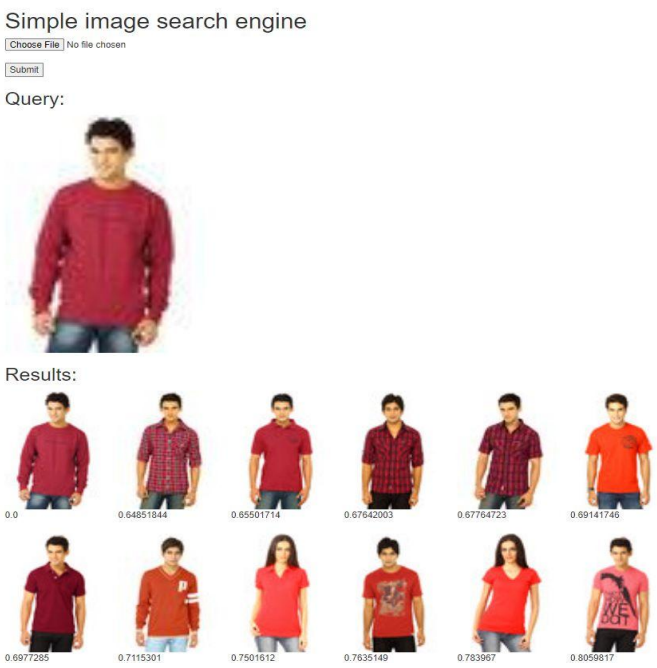
Developers can choose from a huge selection of libraries and frameworks thanks to the vibrant and big Python community. Web development, data science, artificial intelligence, machine learning, and scientific computing are just a few of the industries that use it extensively.

Python is a great choice for novices who are just starting to learn programming because its syntax is made to be simple to understand and write. Programming paradigms including procedural, functional, and object-oriented programming are all supported.




File Edit Selection View Go Run Terminal Help
server.py - query_based_app - Visual Studio Code
EXPLORER
OPEN EDITORS
Welcome
server.py
QUERY_...
__pycache__
.github
static
templates
.gitignore
feature_extractor.py
offline.py
README.md
requirements.txt
server.py
OUTLINE
TIMELINE
Welcome
server.py
server.py > {} np
from flask import Flask, request, render_template
from pathlib import Path
app = Flask(__name__)
# Read image features
fe = FeatureExtractor()
features = []
img_paths = []
for feature_path in Path("./static/feature").glob("*.npy"):
features.append(np.load(feature_path))
img_paths.append(Path("./static/img") / (feature_path.stem + ".jpg"))
features = np.array(features)
@app.route('/', methods=['GET', 'POST'])
def index():
if request.method == 'POST':
file = request.files['query_img']
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
Code
PS C:\Users\hp\OneDrive\Desktop\os_project\query_based_app> python -u "c:\Users\hp\OneDrive\Desktop\os_project\query_based_app\offline.py"
2023-04-11 21:47:50.228454: W tensorflow/tsl/framework/cpu_allocator_impl.cc:83] Allocation of 411041792 exceeds 10% of free system memory.
2023-04-11 21:47:51.607643: W tensorflow/tsl/framework/cpu_allocator_impl.cc:83] Allocation of 411041792 exceeds 10% of free system memory.
2023-04-11 21:47:52.643509: W tensorflow/tsl/framework/cpu_allocator_impl.cc:83] Allocation of 411041792 exceeds 10% of free system memory.
static\img\10566.jpg
1/1 [==============================] - 2s 2s/step
static\img\10572.jpg
1/1 [==============================] - 1s 645ms/step
static\img\12557.jpg
1/1 [==============================] - 1s 632ms/step
static\img\1529.jpg
1/1 [==============================] - 1s 719ms/step
static\img\1530.jpg
Ln 1, Col 1
Spaces: 4
UTF-8
LF
Python
3.10.4 64-bit


* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:5000
* Running on http://192.168.1.7:5000


Simple image search engine
Choose File
No file chosen
Submit
Query:
Results:
0.0
0.64851844
0.65501714
0.67642003
0.67764723
0.69141746
0.6977285
0.7115301
0.7501612
0.7635149
0.783967
0.8059817

# Chapter 3:

# Future Improvements:

1. Deployment on cloud : Currently, our server runs locally. We will deploy this application on cloud and host it on a website, so that it is accessible remotely. This has two benefits :

- Local resources will be saved as the computational tasks will be done on a remote server. This will also save time as we can choose a machine with high resources as a remote server.
- Deploying it will make the application accessible remotely.

2. Using a large dataset : We are using a local dataset currently in our application. This limits our algorithm as neural networks work better on large datasets. We can use a large dataset such as google images for searching for similar images.