Develop And Deploy An Application For Nutrition Assistant

1. Introduction:-

1.1 Overview:

Due to being ignorant of healthy food habits, obesity rates, diabetes, sleep apnea, fatty lever, etc. are increasing at an alarming speed which is reflective of the risks to people's health. According to CBS News large study, poor diet is associated with 1 in 5 deaths worldwide which is equivalent to 11 million deaths a year that makes unhealthy eating habits responsible for more deaths than tobacco and high blood pressure. People need to control their daily nutritional intake by eating healthier foods which is the most basic method to avoid these risks. However, although food packaging comes with nutrition labels, it's still not very convenient for people to refer packaged food due to the use of various preservatives which are not good for health.

Therefore we developed a web-based nutrient dashboard system which can analyze real-time images of a meal for nutritional content which can be very handy and improves the dietary habits, and thus helps in maintaining a healthy lifestyle.

By taking the supplied food image, this web application attempts to identify the food and show us the food qualities like ingredients and nutritional values for precise food recognition to determine the nutritional value of the recognized items. Our solution uses a food detection model and food APIs.

1.2 Purpose:-

Our purpose is that every food vendor and clients will be aware of the meal's quality and the nutrients that are present in the food in an instant. Previously before starting a good diet clients had to study about the nutritional components of each of the food material and calculate the overall nutritional supplements present in an individual food before consuming it. That is too much time consuming and false knowledge in this matter can lead to having unbalanced diet which can be rather cost effective.

But with this application clients can easily get to now about the nutritional components that is present in the food just by using our web application and by clicking a capture of image of the food or upload the food's picture from the galary in the module and the module will give you the nutrients that is present in that food as output.

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2. *Literature Survey*:-

2.1 Existing problem:-

Nutrient deficiencies are prevalent worldwide. Diseases and morbid conditions have been described to result from nutritional deficiencies. It is essential to address nutrient deficiencies as these may lead to chronic long-term health problems such as rickets, iron deficiency anemia, goiter, obesity, coronary heart disease, type 2 diabetes, stroke, cancer and osteoporosis. In the present review we surveyed the extent and severity of nutritional deficiencies in Israel through a selective and comprehensive Medline review of previous reports and studies performed during the last 40 years. Israeli populations have multiple nutritional deficiencies, including iron, calcium, zinc, folic acid, and vitamins B12, C, D and E, spanning all age groups, several minorities, and specific regions. In Israel, some of the nutrients are mandatorily implemented and many of them are implemented voluntarily by local industries. We suggest ways to prevent and treat the nutritional deficiencies, as a step to promote food fortification in Israel.

2.2 *Proposed solution:-*

we are developed web application to take a picture of the food that is being served, the picture is stored in internal memory and automatically applied to the module. And that model is capable of predicting the kind of food image. after that the predicted output will be match to the dataset of composition of food nutrients. The output will be displayed as composition of all the nutrients present inside the particular food. on the web and mobile application's display once the process is complete.so, any people know the type nutrients and its composition of the food.

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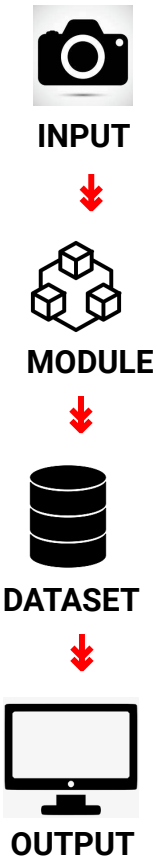
3. *THEORITICAL ANALYSIS*:-

3.1 *Block diagram*:-



3.2 Hardware / Software designing:-

Hardware:-

1. No Hardware is required for this project.

Softwear:-

1. There is only one web application needed.
2. For application deployment, we use Red Hat OpenShift and docker-file.
3. We use Virtual Studio code for writing the code.

4. EXPERIMENTAL INVESTIGATIONS:-

Vitamin deficiencies remain major etiological factors in the global burden of disease, especially in low- and middle-income countries. The purpose of this state-of-the-art review was to update current information on deficiencies of vitamins and public health approaches to addressing them. Some stages of life present a higher risk of deficiency than others: risks are higher in pregnant women, children (from conception to young childhood), adolescents, the elderly, and all of the over 800 million people globally who are undernourished. At risk are approximately 125 million preschool children with vitamin A deficiency, as well as sub-populations at risk of deficiencies of folate, thiamine, vitamin B12, niacin, riboflavin, other B vitamins. and vitamin D. Addressing micro nutrient deficiencies requires identifying those at risk and then working to prevent and manage that risk. Public health approaches include improved, diversified diets; supplementation; fortification and bio fortification; and other supportive public health measures.

Therefore, we have made the decision to create a user-friendly device. to assist folks who do not know the nutritional value of the food while they are purchasing. They buy food accordingly to their nutrient needs. In the field of medical, the equipment is quite beneficial.

By using the developed web application to take a picture of the food that is being served, the picture is stored in internal memory and automatically applied to the module. And that model is capable of predicting the kind of food image. after that the predicted output will be match to the dataset of composition of food nutrients. The output will be displayed as composition of all the nutrients present inside the particular food. on the web and mobile application's display once the process is complete.so, any people know the type nutrients and its composition of the food.

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5. *Flow Chart*:-

INPUT

(THIS APPLICATION(GADGET) IS CAPTURE THE FOOD OF IMAGE WITH THE HELP OF CAMERA.)

(AFTER CAPTURE THE IMAGE, IT WILL STORE IN INTERNAL MEMORY. AND THAT MODULE TAKEN IMAGE FROM INTERNALLY LINKED.)

(WE HAVE A CREATED ONE MODULE USING MACHINE LEARNING WITH PYTHON AND DATASET OF IMAGE . THAT MODULE HELP TO IDENTIFY THE CATEGORY(IMAGE) OF THE FOOD .)

(WE HAVE ALSO CREATED ANOTHER DATASET OF THE NUTRIENTS.THE OUTPUT OF THE MODULE IS MATCHING THE DATASET OF THE NUTRIENTS WITH THE HELP OF THAT DATASET THE FINAL OUTPUT DISPLAY.)

(IN TABLE FORMATE LIST OF THE COMPOSITION AND TYPE OF THE NUTRIENTS ID DISPLAY ON THE SCREEN.)

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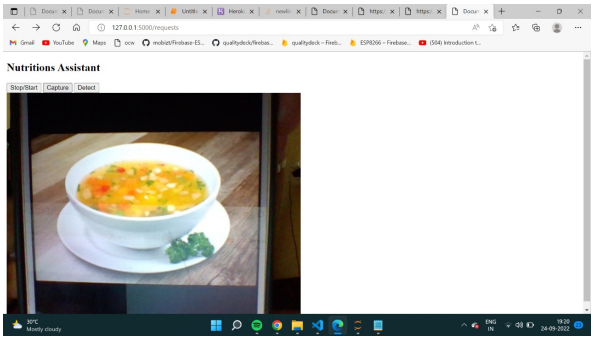
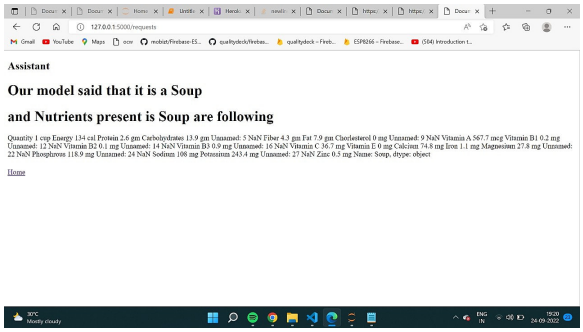
6. ***RESULT*:-**





7. ***ADVANTAGES & DISADVANTAGES* :-**

Advantages:-

1. This device is user friendly.
2. Its only required the image of the food .
3. To know the different type of nutrients present in food .
4. And also know that how much composition of the nutrients are present.
5. Output of the screen is easy understandable.

Disadvantage:-

1. This device is not able to predict the multiple image as input.
2. The internet is only necessary for opening the web application.(After converting the mobile app internet is not necessary for opening .)

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8. APPLICATIONS:-

Any food production firm can use this technology to verify the ingredients after utilizing it to determine the components and nutrients present in each food item. The company can then simply print the ingredients on the food package. This technique cuts down on the time needed to identify substances.

It is also useful assist folks who do not know the nutritional value of the food while they are purchasing. They buy food accordingly to their nutrient needs. In the field of **medical world**, the equipment is quite beneficial.

9. CONCLUSION:-

During this assignment we were able to take a closer look at our daily eating habits. From here we can now improve our application so that we can help clients to eat and grow healthier as a person and athlete.

I can truly say that I learnt a lot from this assignment. I was able to point out changes I needed to make and how to move forward and make it work in my life.

I am now more educated on the powers of food and how they control our body. I hope that people will use our application to lead a healthy life. When choosing the right foods for yourself you should be focused on what is the healthiest choice. Eating healthy and feeling good go hand in hand, eating better will automatically give you a better functioning body. Eating healthy means eating a variety of foods that meet your daily requirements.

We would recommend our application to anyone who is interested in eating healthy. Not only is it easy to use, but it is a great way to evaluate what you are eating and understand the vitamins and minerals that you need.

10. FUTURE SCOPE:-

The device will also assist you determine the quantity and degree of flavour of the food.

Future goals include increasing the accuracy of our machine learning model and expanding the types of food categories so that we can better meet user needs.

We are also increasing dataset of categories of images and nutrition to better efficiency to get output.

Our research essentially identifies simply the nutrients, but our team members raise the bar for our project so that we also understand the ingredients and the amount of nutrients in a particular cuisine.

11. BIBILOGRAPHY:-

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APPENDIX :-

A. Source Code:-

```
from flask import Flask, render_template, Response, request

  import cv2
  import datetime, time
  import os, sys
  import numpy as np
  from threading import Thread
  ## csv code
  import pandas as pd
  read_file = pd.read_excel ("C:\\Users\\anish\\Desktop\\IBM2\\Book.xlsx")
  read_file.to_csv ("Test.csv",
                    index = None,
                    header=True)
  df = pd.DataFrame(pd.read_csv("Test.csv"))
  df.to_csv("Test.csv")
  df=df.set_index("Food Name")
  def Nutrients(Name):
```

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```
    name=Name
    return(df.loc[(name),:])
##
global capture,rec_frame, grey, switch, neg, face, rec, out,p,d
capture=0
grey=0
neg=0
face=0
switch=1
rec=0
# ML
import keras
import cv2
import tensorflow as tf
#import PIL.Image
#from tensorflow.keras.utils import to_categorical
#from tensorflow.keras.preprocessing.image import load_img, img_to_array
from keras_preprocessing.image import load_img,img_to_array
#from tensorflow.python.keras.preprocessing.image import ImageDataGenerator
#from keras.preprocessing.image import ImageDataGenerator

#import tensorflow.compat.v2 as tf
from keras.models import load_model
model = keras.models.load_model('C:\\Users\\anish\\Desktop\\IBM2\\Daiyan.h5')
import numpy as np

##
import numpy as np
CATEGORIES =  ['Vegetable-Fruit', 'Egg', 'Bread', 'Soup', 'Seafood', 'Meat', 'vada pav', 'Fried food', 'pizza',
'Dessert', 'Dairy product', 'Rice', 'burger', 'Noodles-Pasta']

def image(path):
    img = cv2.imread(path, cv2.IMREAD_GRAYSCALE)
    new_arr = cv2.resize(img, (60, 60))
```

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```
    new_arr = np.array(new_arr)
    new_arr = new_arr.reshape(-1, 60, 60, 1)
    return new_arr
 ##
#make shots directory to save pics
try:
    os.mkdir('./shots')
except OSError as error:
    pass

#instatiate flask app
app = Flask(__name__, template_folder='./templates')

camera = cv2.VideoCapture(0)
# def Path(d):
#     a=d
#     return a


def gen_frames():  # generate frame by frame from camera
    global out, capture,rec_frame,d
    while True:
        success, frame = camera.read()
        if success:
            if(capture):
                capture=0
                now = datetime.datetime.now()
                p = os.path.sep.join(['shots', "shot_{}.png".format(str(now).replace(":",""))])
                #d=("C:\\Users\\anish\\Desktop\\IBM2\\"+p)
                cv2.imwrite(p, frame)
                d=p
```

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```
            try:
                ret, buffer = cv2.imencode('.jpg', cv2.flip(frame,1))
                frame = buffer.tobytes()
                yield (b'--frame\r\n'
                       b'Content-Type: image/jpeg\r\n\r\n' + frame + b'\r\n')
            except Exception as e:
                pass

        else:
            pass
```

```
@app.route('/')
def index():
    return render_template('index.html')

@app.route('/uplod')
def uplod():
    return render_template('index.html')

@app.route('/video_feed')
def video_feed():
    return Response(gen_frames(), mimetype='multipart/x-mixed-replace; boundary=frame')
```

```
@app.route('/requests',methods=['POST','GET'])
def tasks():
```

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```
global switch,camera
if request.method == 'POST':
    if request.form.get('click') == 'Capture':
        global capture
        capture=1

    elif request.form.get('detect') == 'Detect':
        # prediction = model.predict([image("C:\\Users\\anish\\Desktop\\IBM2\\download.jfif")])



        path = os.getcwd()
        print(d)
        p=os.path.join(path, "", d )









        prediction = model.predict([image(p)])



        name=(CATEGORIES[prediction.argmax()])
        Product_name=name
        data=Nutrients(Product_name)
        return render_template('Predect.html',name=name,data=data)

    elif  request.form.get('stop') == 'Stop/Start':
        if(switch==1):
            switch=0
            camera.release()
            cv2.destroyAllWindows()

        else:
            camera = cv2.VideoCapture(0)
```

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```
                switch=1



    elif request.method=='GET':
        return render_template('index.html')
    return render_template('index.html')


if __name__ == '__main__':
    app.run()

camera.release()
cv2.destroyAllWindows()
```