Calorie Counter using Django framework

Saritha M[1], Akshatha K[2], Chinmayi B[3] , Mangala[4] , Neha S G[5]

1 Assistant Professor Computer Science Department, SDM Institute of Technology
2,3,4,5 B.E Computer Science Students, SDM Institute of Technology

---

Abstract - In order to stay fit our food intake must be healthy. One of the essential parts of healthy eating is counting calories. Calorie counter assists the user in weight management by helping them to keep track on their diet and activities. It estimates minimum calories required by the user based on the information provided by them. User can select the consumed food from database. From this data, system calculates the consumed calorie and suggests the dietary plan. Also it contains the healthy tips and healthy food recipe.

***Key Words*:** calories, balanced food, workout suggestions, healthy tips, healthy food recipe, basal metabolic rate(BMR).

1. INTRODUCTION

Major health problems that are faced by most of the people nowadays are due to obesity. One of the reasons for obesity is unbalanced food. Therefore, we have to consume good food for healthy life. Good nutrition is important to maintain our health. Many people prefer dieting to overcome from obesity. Success of dieting and weight loss is based on the food what we intake in a day. So counting calorie is one of the important roles in part of healthy lifestyle. Calorie is a unit of measurement for the energy value of food. Calorie counter calculates the required calorie and consumed calorie. Then provides the dietary plans and workout suggestion for the user. Hence it helps them to stay fit and healthy.

2. LITERATURE REVIEW

In 2018, Benjarat Tirasirichai, Peeraya Thanomboon Pimpaknat Soontorntham, Worapan Kusakunniran "Bloom Balance: Calorie Balancing Application with scientific Validation" [1] proposed calorie counter, separated into the intake-calorie and burned-calorie counters. Calorie was calculated by using the consumed food daily and walking/running steps worked out daily. For the future work of this project, the Bloom Balance should be able to provide more types of exercises or activities, apart from walking and running. Also, the food database should be expanded.

In 2017, Nor Aziah Amirah Nor Muhammad, Chin Poo Lee, Kian Ming Lim, Siti Fatimah Abdul Razak "Malaysian Food Recognition and Calorie Counter Application"[2] explored the idea to add auto recognition feature into a calorie counter application while identifying the challenges faced to perform recognition on Malaysian traditional food. It quickly snaps a picture and record their calorie intake. The improved system can be commercialized to specific target audiences like tourists, patients and other relevant users who would attain benefit from this system.

In 2018, Md. Nasfikur R. Khan*, W. Faarhin Durdana, Robin Roy, Gobinda Poddar, Sabrina Ferdous, A K Ehsanul Haque Mashuk "Health Guardian – A Subsidiary Android Application For Maintaining Sound Health" [3] came up with the app which notify about the calorie level in a food and monitor the amount of calorie burned after performing exercise. It provided the identification of food calories you consume. A major improvement would be to synchronize this app with more food categories, and to implement a different section of feedback or suggestion.

In 2015, Shahreen Kasim, Faten Azmira Zakaria "Daily Calorie Manager for Basic daily use" [4] approached an overview on food calories contained in most of Malaysian foods also they checked their calorie activities in order to burn out their excess calories. This application had limitations in allowing the user to add another calorie detail of foods and activities. Also suggestion box for the user to suggest the data of foods or activities to be added in the list.

In 2016, Shirmohammadi "Food calorie measurement using deep learning neural network" [5] proposed system runs on smartphones, which allow the user to take a picture of the food and measure the amount of calorie intake automatically. Further it can be increase the database of images and use the approach to test mixed food portions.

In 2016, R Pawan Sai, Suma Bapanapalle and Praveen K, Sunil MP "Pedometer and Calorie Calculator for Fitness Tracking Using MEMS Digital Accelerometer" [6] proposed system calculated the number of steps taken by the person and displaying the total distance travelled by the person. They used mathematical formula to calculate total calories and displayed on a LCD.

In 2014, P. Parisa, S. Shervin, Rana Al-Maghrabi, "Measuring Calorie and Nutrition From Food Image" [7] introduced that, the system used the built-in camera of such mobile devices and recorded a photo of the food before and after eating it to measure the consumption of calorie and nutrient components. Future work is to cover more food types from a variety of cuisines, mixed food or even liquid food.

In 2015, McAllister, H. Zheng, R. Bond, and A. Moorhead, "Semi-automated system for predicting calories in

photographs of meals" [8] determined a ground truth data set by correlating weight of a food item with its area in cm2. The dataset could be plotted on a regression model and used to determine calorie content of future portions. Also it allowed users to manually draw around the food portion using a polygonal tool. The data collection process could be improved by lowering the gram increments to 5 gram portions instead of 10 grams to help increase accuracy.

3. PRIOR KNOWLEDGE

Prior knowledge needed for this proposed system is explained here.

1. Calorie: A calorie is a unit of measurement; but it doesn't measure weight or length. A calorie is a unit of energy. The calories we eat supply our bodies with the energy needed to live and stay healthy.
2. BMR Calculation: Basal Metabolic Rate is the number of calories required by our body to accomplish its most basic life-sustaining functions. In this proposed project Revised Harris- Benedict Formula is used to calculate BMR. The calculation is different for male and female as shown below.
   Male: BMR = 88.362 + (13.397 × weight in kilograms) + (4.799 × height in centimeters) - (5.677 × age in years)
   Female: BMR= 447.6 + (9.25 x weight in kilograms) + (3.10 x height in centimeters) – (4.33 x age in years)
3. Total Required calorie: It is the amount of energy that we burn in one day. It depends on our activity level. The formula is
   Sedentary : TotalCalories = BMR x 1.2
   Lightly active : TotalCalories = BMR x 1.375
   Moderately active : TotalCalories = BMR x 1.55
   Very active : TotalCalories = BMR x 1.725
   Extra active : TotalCalories = BMR x 1.9

4. DESIGN AND ANALYSIS

i) System Architecture:

The calorie counter system developed by using Django framework and SQLite database is used for storing the data. As shown in Figure-1 it is divided into five parts which are

1) BMR calculation
2) Food consumption list
3) Left out calorie consumption
4) Calorie status
5) Diet plan/workout suggestion.

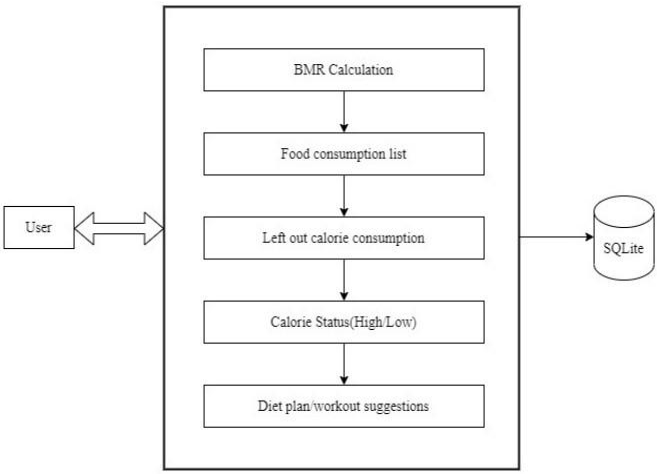

Figure-1: System architecture of calorie counter System

BMR calculation calculates the total calorie required for the user based on their height, weight, age, gender and activity level. Food consumption list consists of food chart with appropriate calories. Using this list user can enter the food consumed by them. Left out calorie consumption calculates the left out calorie by using required calories and consumed calories. Calorie status displays the status as over consumed or under consumed. If consumed calorie is more than that of required calorie then calorie status will be displayed as over consumed, otherwise it displays the status as under consumed. At last system gives the calorie review by diet plans or workout suggestions.

5. METHODOLOGY

Calorie counter, mainly there are three steps:

- Calculate the calorie required
- Calorie consumed
- Display the left out calorie

User login through his/her credentials in home page or just register by sign up. After successful login user can view their profile page which includes calculate BMR, add food and Calorie status. When user navigate to BMR page, system will perform BMR calculation using parameters like user's age in year, gender, weight in Kilograms, height in centimeters and activity i.e. sedentary, lightly active, moderately active or extra active. It generates required calorie for a user and system stores this data.

Later user can view the food list along with calorie values, quantity and adds the food that they are consumed in a day. It gives consumed calorie by the user and this data gets stored.

Finally, when user navigates for calorie status page which gives left out calorie by using required and consumed calorie which is already stored. If user has over consumed, system will suggest good workouts, exercise. Otherwise it suggests good and balanced diet plans.

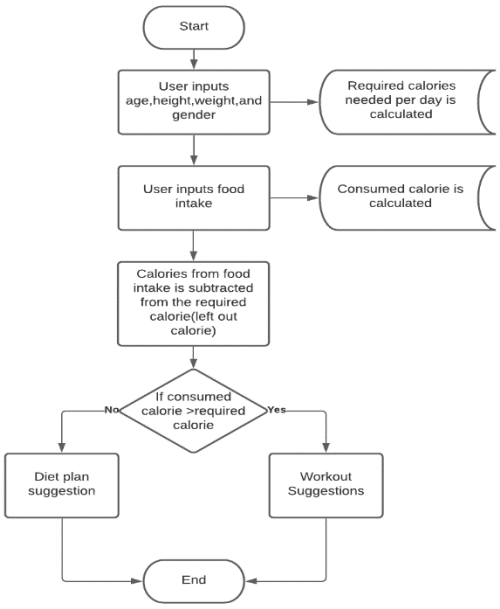

Figure-2: Flowchart of calorie counter System

6. IMPLEMENTATION

Calorie counter system developed using Django framework. The languages used for the development of this system are Python, HTML and SQLite.

The proposed project consists two implementation modules.

i) Admin modules

ii) User modules

Admin modules contains complete details of user, food intake consumed and maintains left out calorie. It manages required calorie for a day by BMR, food database by adding, updating food items to the list with appropriate calorie, carbohydrates, fats, protein values and quantity.

User modules inputs parameters like age, gender, weight, height and activities for calculating BMR. Later, he/she adds food items consumed from given food list. User can only view his calorie status and suitable workout or diet plan.

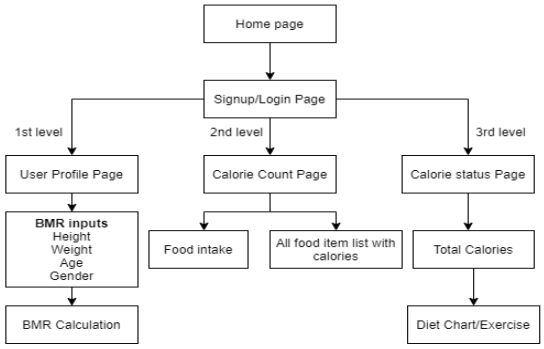

Figure-3: User interface of calorie counter System

i) System testing:

Proposed system modules are tested independently to calculate required calorie by BMR calculation and consumed calorie by using food intake list. It results the left out calorie by using required and consumed calories. Finally, it displays calorie status based on BMR module and Food intake module as input. Below tables are the test cases for Sign-Up, Login and BMR calculation.

Unit to test	Sign-Up
Assumption	The webpage displayed the signup input screen and wait for user's action
Input	User name, User password, confirm password and user mail ID
Expect output	Register successfully with proper input, register unsuccessfully with improper input
pass	Function fit the requirement

Table-1: Test case for Sign-Up

Unit to test	Login
Assumption	The webpage display the login input screen and wait for user's action
Input	User name, User password
Expect output	Login successfully with proper input, invalid input with wrong credentials
pass	Function fit the requirement

Table-2: Test case for Login

Unit to test	BMR
Assumption	After successful login, the BMR webpage waits for user's action input
Input	Age, gender, height, weight and activity
Expected Output	BMR calculates to display the required calorie
Pass	BMR outputs correct values as per Revised Harris-Benedict Formula

Table-3: Test case for BMR Calculation

7. RESULTS AND DISCUSSION

Figure-4: BMR calculation

Displays total calories required for a user

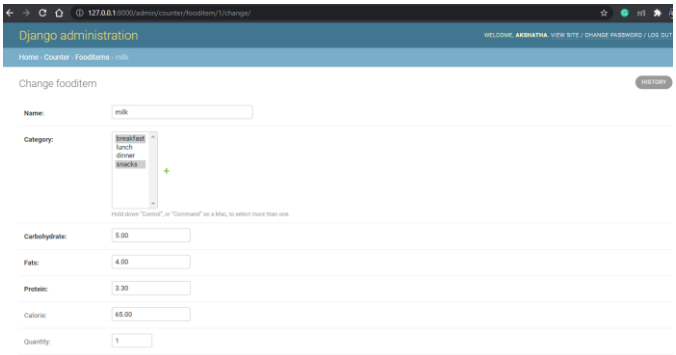

Figure-5: Food details page

It adds food items with its appropriate details

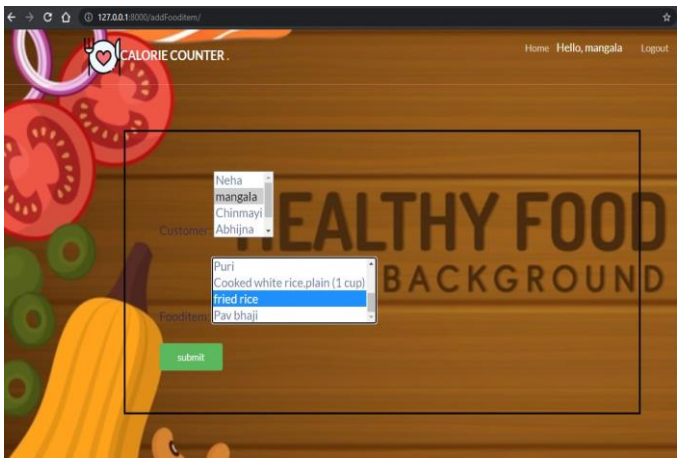

Figure-6: Add Food item Page

User adds the food items that he/she had consumed for a day which have stored in food database by admin.

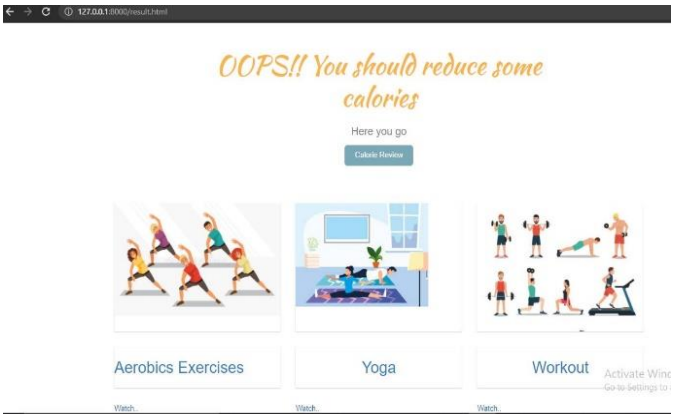

Figure-7: Calorie status page

It displays leftout with suitable suggestions after calculating consumed calorie

8. CONCLUSION

This paper describes the calorie counter which helps to figure out how to adjust food diet to continue the same amount of balanced food and it encourages the users to practice a healthier and balanced lifestyle consistently. This system is developed using Django framework and Python Language. It motivates users to change the daily dietary pattern in a healthier way, self-calorie monitoring and balanced diet goal setting. As a future scope we can add more food database, the user can review their weekly calorie status to analyze their activity. Different workouts can be added to help user meet their target and significant performance improvements can be obtained in our system.

REFERENCES

[1] Benjarat Tirasirichai, Worapan Kusakunniran, Peeraya Thanomboon Pimpaknat Soontorntham, “Bloom Balance: Calorie Balancing Application with scientific Validation” 15th International Joint Conference on Computer Science and Software Engineering(JCSSE), 2018.

[2] Nor Aziah Amirah Nor Muhammad, Chin Poo Lee, Kian Ming Lim, Siti Fatimah Abdul Razak “Malaysian Food Recognition and Calorie Counter Application” 2017 IEEE 15th Student Conference on Research and Development (SCOReD), 2017.

[3] Md. Nasfikur R. Khan*, W. Faarhin Durdana, Robin Roy, Gobinda Poddar, Sabrina Ferdous, A K Ehsanul Haque Mashuk “Health Guardian – A Subsidiary Android Application For Maintaining Sound Health” International Conference on Recent Innovations in Electrical, Electronics & Communication Engineering(ICRIEECE), 2018.

[4] Shahreen Kasim, Faten Azmira Zakaria “Daily Calorie Manager for Basic daily use” Third International

Conference on Innovative Computing Technology (INTECH), 2015.

[5] Shirmohammadi, "Food calorie measurement using deep learning neural network,“ in Instrumentation and Measurement Technology Conference Proceedings (I2MTC), pp. 1-6: IEEE, 2016.

[6] R Pawan Sai, Suma Bapanapalle and Praveen K, Sunil MP, “Pedometer and Calorie Calculator for Fitness Tracking Using MEMS Digital Accelerometer” International Conference on Inventive Computation Technologies (ICICT), 2016.

[7] P. Parisa, S. Shervin, Rana Al-Maghrabi, "MeasuringCalorie and Nutrition From Food Image," IEEE Transactionson Instrumentation and Measurement, Volume: 63, Issue: 8, pp.1947-1956: IEEE, Feb. 2014.

[8] McAllister, H. Zheng, R. Bond, and A. Moorhead, "Semi-automated system for predicting calories in photographs of meals," in Engineering, Technology and Innovation International Technology Management Conference (ICE/ITMC) pp. 1-6: IEEE, 2015.