Nutrition Monitoring and Evaluation

Submitted in partial fulfillment of the requirements of the degree of

Bachelor of Engineering

in

Electronics and Telecommunication

by

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CERTIFICATE

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This is to certify that the project entitled ***Project Title*** *is a bonafide work of* ***Imtiyaz Shaikh(14DET109),MusabAnsari(14ET17),HusainShaikh(16DET123),AniketGujari(14ET21)*** *submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of Bachelor of Engineering in Department of Electronics and Telecommunication Engineering.*

_____ _____

Supervisor *Examiner*

_____ _____

Head of Department *Director*

Project Report Approval for Bachelor of Engineering

This project entitled ***"Nutrition Evaluation And Moitoring"*** *by* ***Imtiyaz Shaikh, Musab Ansari, Hussain Shaikh, Aniket Gujari*** *is approved for the degree of* ***Bachelor of Engineeringin Electronics and Telecommunication***

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Examiner

.....

Supervisor

.....

Date;

Place:

Declaration

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Abstract

The Project require both hardware and software system . Hardware system will consist of bio- electric sensor and detectors , displays , input keypad which will sense the body fat ,bmr and other parameters of the body and give the values of the parameters to the software system. The software system will compare this parameter and give you ideal values of the body fat , body weight and generate a workout as well as diet depending upon the difference values.

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Keywords And Glossary

Keywords : Bio-electric current, BMR, Body fat, Weight , Ideal weight , Diet, Workout, Python

Glossary :

Embedded system and computer science application is an amalgam technique which can be used for solving a problem more quickly and efficiently.

BMR:

The basal metabolic rate (BMR) is the amount of energy needed while resting in a temperate environment when the digestive system is inactive. It is the equivalent of figuring out how much gas an idle car consumes while parked. In such a state, energy will be used only to maintain vital organs, which include the heart, lungs, kidneys, nervous system, intestines, liver, lungs, sex organs, muscles, and skin. For most people, upwards of ~70% of total energy (calories) burned each day is due to upkeep. Physical activity makes up ~20% of expenditure and ~10% is used for the digestion of food, also known as thermogenesis.

The BMR is measured under very restrictive circumstances while awake. An accurate BMR measurement requires that a person's sympathetic nervous system is inactive, which means the person must be completely rested. Basal metabolism is usually the largest component of a person's total caloric needs. The daily caloric need is the BMR value multiplied by a factor with a value between 1.2 and 1.9, depending on activity level.

In most situations, the BMR is estimated with equations summarized from statistical data. The Harris-Benedict Equation was one of the earliest equations introduced. It was revised in 1984 to be more accurate and was used up until 1990, when the Mifflin-St Jeor Equation was introduced. The Mifflin-St Jeor Equation has been shown to be more accurate than the revised Harris-Benedict Equation. The Katch-McArdle Formula is slightly different in that it calculates resting daily energy expenditure (RDEE), which takes lean body mass into account, something that neither the Mifflin-St Jeor nor the Harris-Benedict Equation do. Of these equations, the Mifflin-St Jeor Equation is considered the most accurate equation for calculating BMR with the exception that the Katch-McArdle Formula can be more accurate for people who are leaner and know their body fat percentage. You can pick the equation to be used in the calculation by expand the settings.

The three equations used by the calculator are listed below:

Mifflin-St Jeor Equation:

For men:

$$BMR = 10W + 6.25H - 5A + 5$$

For women:

$$BMR = 10W + 6.25H - 5A - 161$$

Revised Harris-Benedict Equation:

For men:

$$BMR = 13.397W + 4.799H - 5.677A + 88.362$$

For women:

$$BMR = 9.247W + 3.098H - 4.330A + 447.593$$

Katch-McArdle Formula:

$$BMR = 370 + 21.6(1 - F)W$$

where:

W is body weight in kg
H is body height in cm
A is age
F is body fat in percentage

BMI:

BMI is a measurement of a person's leanness or corpulence based on their height and weight, and is intended to quantify tissue mass. It is widely used as a general indicator of whether a person has a healthy body weight for their height. Specifically, the value obtained from the calculation of BMI is used to categorize whether a person is underweight, normal weight, overweight, or obese depending on what range the value falls between. These ranges of BMI vary based on factors such as region and age, and are sometimes further divided into subcategories such as severely underweight or very severely obese. Being overweight or underweight can have significant health effects, so while BMI is an imperfect measure of healthy body weight, it is a useful indicator of whether any additional testing or action is required. Refer to the table below to see the different categories based on BMI that is used by the calculator.

BMI formula

Below are the equations used for calculating BMI in the International System of Units (SI) and the US customary system (USC) using a 5'10", 160-pound individual as an example:

USC Units:

$$BMI = 703 \times \frac{mass\ (lbs)}{height^2\ (in)} = 703 \times \frac{160}{70^2} = 22.96\ \frac{kg}{m^2}$$

SI, Metric Units:

$$BMI = \frac{mass\ (kg)}{height^2\ (m)} = \frac{72.57}{1.78^2} = 22.90\ \frac{kg}{m^2}$$

Body Fat:

The Body Fat Calculator can be used to estimate your total body fat based on specific measurements. Use the "Metric Units" tab if you are more comfortable with the International System of Units (SI). To get the best results, measure to the nearest 1/4 inch (0.5 cm). This calculation is based on the U.S. Navy method,

Measuring Body Fat Percentage

U.S. Navy Method:

There are many specific techniques used for measuring body fat. The calculator above uses a method involving equations developed at the Naval Health Research Center by Hodgdon and Beckett in 1984. The method for measuring the relevant body parts as well as the specific equations used are provided below:

- *Measure the circumference of the subject's waist at a horizontal level around the navel for men, and at the level with the smallest width for women. Ensure that the subject does not pull their stomach inwards to obtain accurate measurements.*
- *Measure the circumference of the subject's neck starting below the larynx, with the tape sloping downward to the front. The subject should avoid flaring their neck outwards.*
- ***For women only:** Measure the circumference of the subject's hips at the largest horizontal measure.*

Once these measurements are obtained, use the following formulas to calculate an estimate of body fat. Two equations are provided, one using the U.S. customary system (USC) which uses inches, and the other using the International System of Units, specifically the unit ofcentimeters:

Body fat percentage (BFP) formula for males:

USC Units:

$$BFP = 86.010 \times \log_{10}(\text{abdomen-neck}) - 70.041 \times \log_{10}(\text{height}) + 36.76$$

SI, Metric Units:

$$BFP = \frac{495}{1.0324 - 0.19077 \times \log_{10}(\text{waist-neck}) + 0.15456 \times \log_{10}(\text{height})} - 450$$

Body fat percentage (BFP) formula for females:

USC Units:

$$BFP = 163.205 \times \log_{10}(\text{waist+hip-neck}) - 97.684 \times (\log_{10}(\text{height})) + 36.76$$

SI, Metric Units:

$$BFP = \frac{495}{1.29579 - 0.35004 \times \log_{10}(\text{waist+hip-neck}) + 0.22100 \times \log_{10}(\text{height})} - 450$$

Note that results of these calculations are only an estimate since they are based on many different assumptions to make them as applicable to as many people as possible. For more accurate measurements of body fat, the use of instruments such as bioelectric impedance analysis or hydrostatic density testing is necessary.

Fat mass (FM) formula:

$$FM = BF \times Weight$$

Lean Mass (LM) formula:

$$LM = Weight - FM$$

OBESITY:

Overview

Obesity is a complex disease involving an excessive amount of body fat. Obesity isn't just a cosmetic concern. It is a medical problem that increases your risk of other diseases and health problems, such as heart disease, diabetes, high blood pressure and certain cancers. There are many reasons why some people have difficulty avoiding obesity. Usually, obesity results from a combination of inherited factors, combined with the environment and personal diet and exercise choices.

The good news is that even modest weight loss can improve or prevent the health

BMI	WEIGHT STATUS
Below 18.5	Underweight
18.5-24.9	Normal
25.0-29.9	Overweight
30.0 and higher	Obesity

problems associated with obesity. Dietary changes, increased physical activity and behavior changes can help you lose weight. Prescription medications and weight-loss procedures are additional options for treating obesity.

Symptoms:

Obesity is diagnosed when your body mass index (BMI) is 30 or higher. To determine your body mass index, divide your weight in pounds by your height in inches squared and multiply by 703. Or divide your weight in kilograms by your height in meters squared.

For most people, BMI provides a reasonable estimate of body fat. However, BMI doesn't directly measure body fat, so some people, such as muscular athletes, may have a BMI in the obesity category even though they don't have excess body fat.

Healthy Diet:

*A **healthy** diet is one that helps maintain or improve overall health. A healthy diet provides the body with essential nutrition: fluid, macronutrients,micronutrients, and adequate calories.*

A healthy diet may contain fruits, vegetables, and whole grains, and includes little to no processed food and sweetend beverages. The requirements for a healthy diet can be met from a variety of plant-based and animal-based foods, although a non-animal source of Vitamin B12 is needed for those following a vegan diet. Various nutrition guides are published by medical and governmental institutions to educate individuals on what they should be eating to be healthy. Nutrition facts label are also mandatory in some countries to allow consumers to choose between foods based on the components relevant to health.

The World Health Organization (WHO) makes the following five recommendations with respect to both populations and individuals:

1. *Maintain a healthy weight by eating roughly the same number of calories that your body is using.*

2. *Limit intake of fats. Not more than 30% of the total calories should come from fats. Prefer unsaturated fats to saturated fats. Avoid trans fats.*

3. *Eat at least 400 grams of fruits and vegetables per day (potatoes, sweet potatoes, cassava and other starchy roots do not count). A healthy diet also contains legumes (e.g. lentils, beans), whole grains and nuts.*

4. *Limit the intake of simple sugars to less than 10% of calorie (below 5% of calories or 25 grams may be even better).*

5. *Limit salt/ sodium from all sources and ensure that salt is iodized. Less than 5 grams of salt per day can reduce the risk of cardiovascular disease.*

Chapter 1

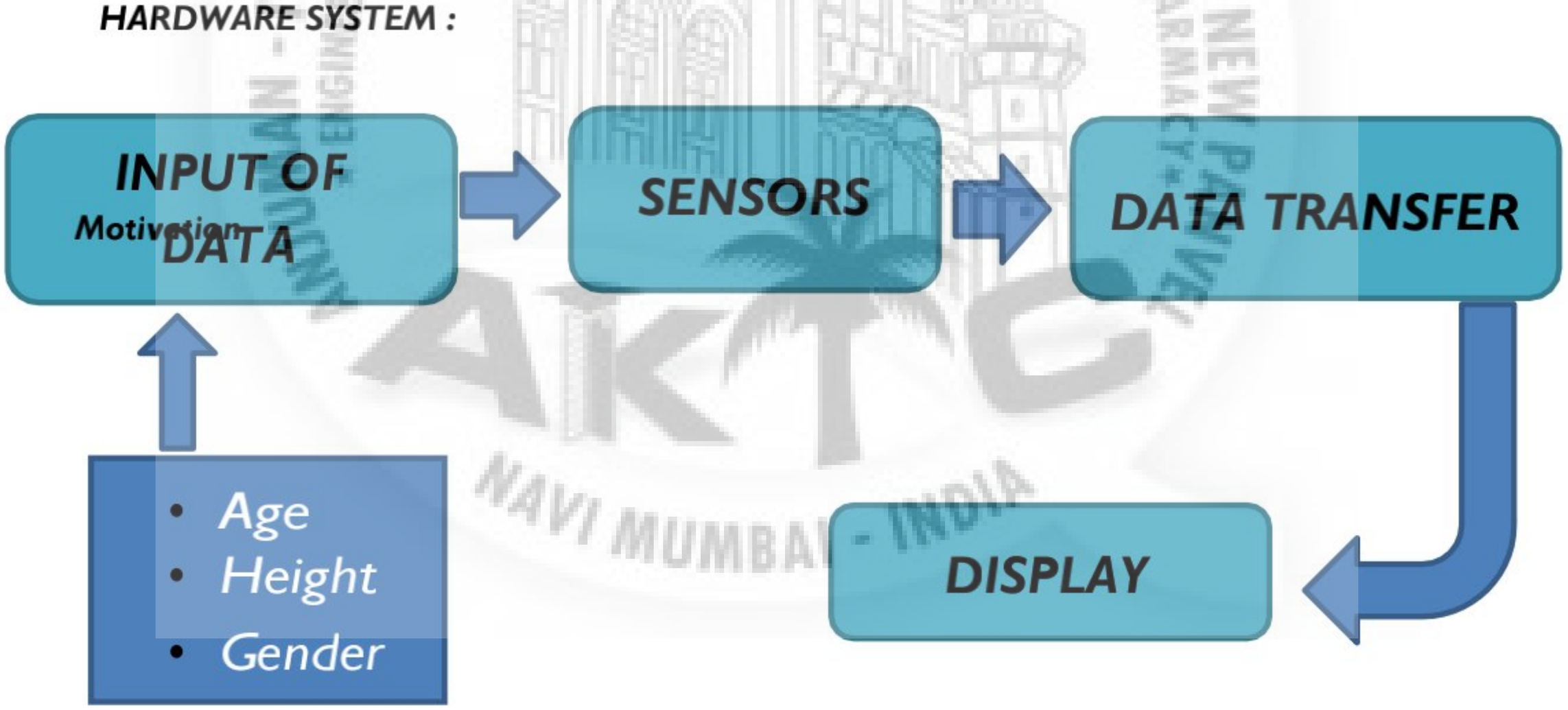
Introduction

Statement of Project

In this report, Nutrition Evaluation and Monitoring system is designed . Calculations of the body fat, BMR , weight and giving this values to the software system wherein we get the ideal values through an algorithm and to meet the requirement a diet chart and workout chart.

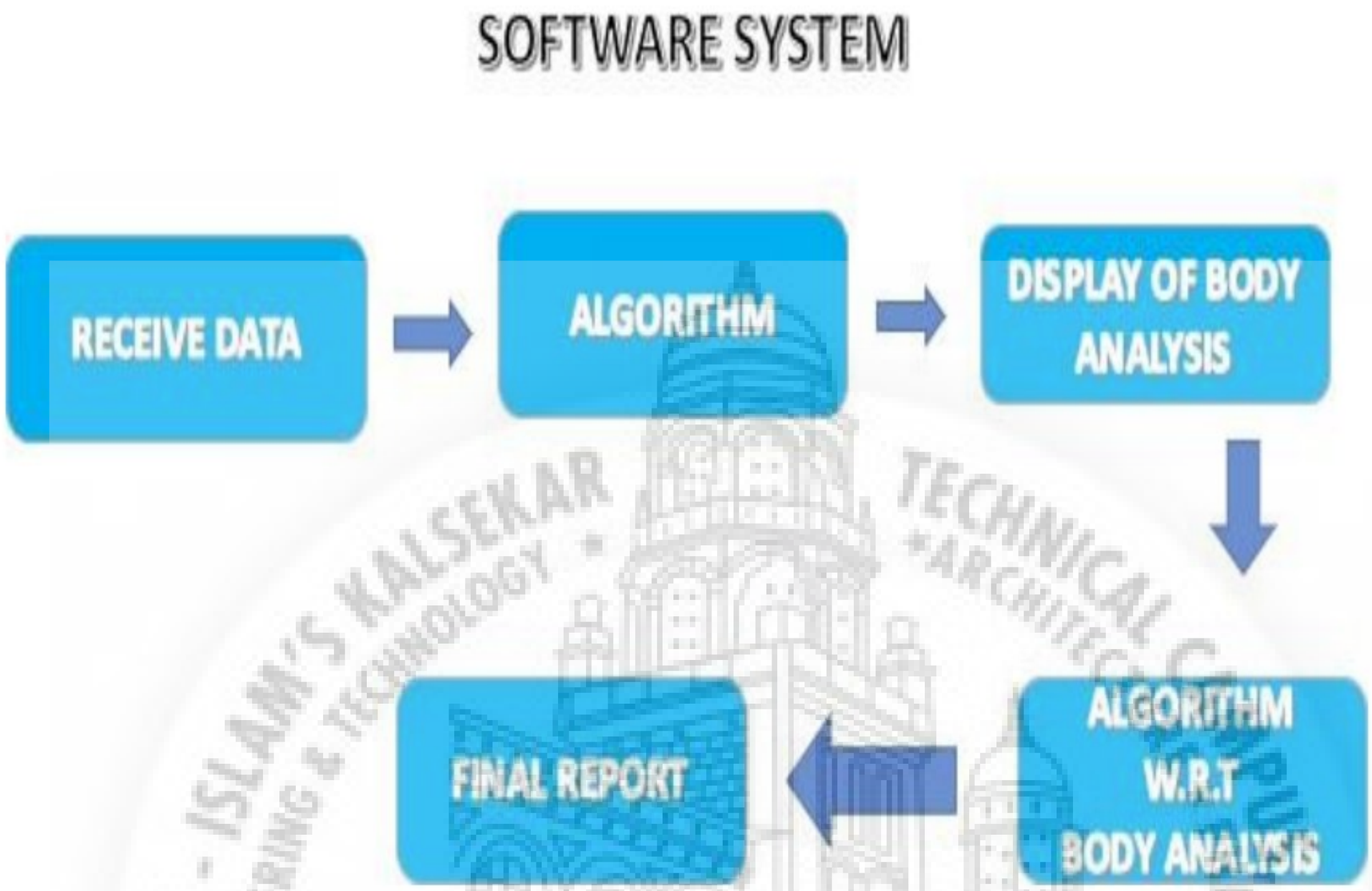
Project Architecture:

HARDWARE SYSTEM :



Being from fitness industry as well as seeing the present condition where we see many people under weight or obese everywhere. So our main motive is to provide everyone with healthy diets personally design for each person and make them healthy.

SOFTWARE SYSTEM:



Objective and Scope

1-The main objective is to make every one fit and remove their unhealthy habit a
2-To improve the new culture of unhealthy eating and living which will indirectly help in more productivity in work from person

Chapter 2

Literature Review

Nutrition is the study of nutrients in food, how the body uses nutrients, and the relationship between diet, health, and disease .Major food manufacturers employ nutritionists and food scientists.Nutritionists may also work in journalism, education, and research.

Many nutritionists work in the field of food science and technology.There is a lot of overlap between what nutritionists and dietitians do and study. Some nutritionists work in a healthcare setting, some dietitians work in the food industry, but a higher percentage of nutritionists work in the food industry and in food science and technology, and a higher percentage of dietitians work in healthcare, corporate wellness, research, and education.In India 20 per cent of children under five years of age suffer from wasting due to acute undernutrition.

More than one third of the world's children who are wasted live in India.Forty three per cent of Indian children under five years are underweight and 48 per cent (i.e. 61 million children) are stunted due to chronic undernutrition, India accounts for more than 3 out of every 10 stunted children in the world.

Chapter 3

Technical Details

Methodology

Input weight, height, age gender is given to the hardware system at first. Then the person stands on the system and a bio electric current is pass inside the person body which penetrates inside the body at different speed depending upon the person fats and muscle .

This current is then received at the receiver side and the time is calculated from which we get the bodyfat percentage. This values are then given to the software system wherein this values are run in an algorithm which will give us the value of the bmr, bodyfat, weight, subcutaneous fat, muscle mass . This values will be then displayed to the user .

The ideas values for the same will be given from the refrences so the user can compare how unfit he is . To overcome this and get fit i.e to reduce or gain weight the software system will then generate a diet chart according to person requirement by using his basal metabolic rate value .

Project Requirements

1. Bio-electric transmitter and receiver
2. Weight sensors
3. Display device
4. Connectors
5. Keypad

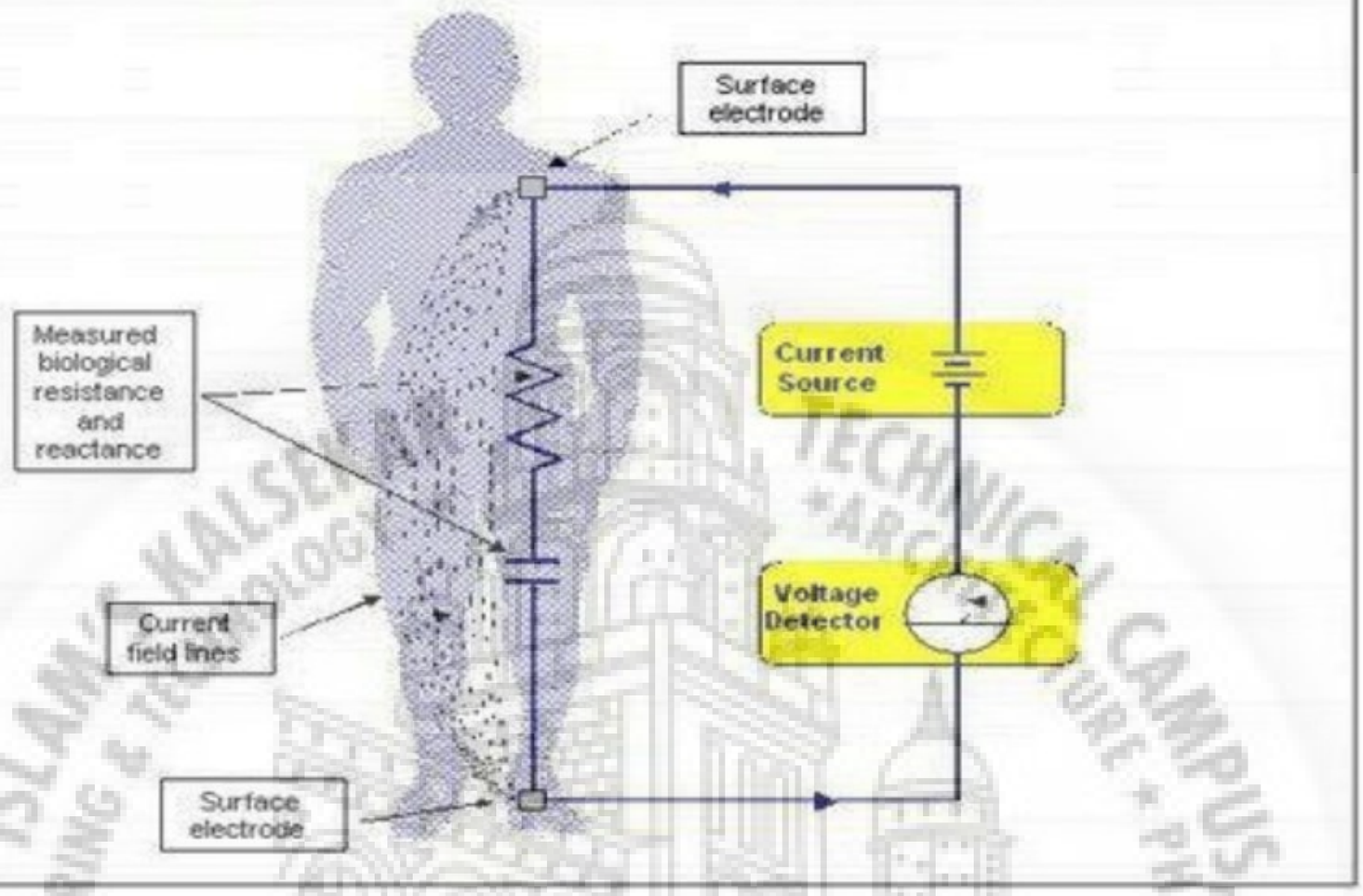
Software Requirements

1. *Python*

Hardware Requirements

Bio Electric Scanning

Fig. 1: Schematic of the Principles of Bioelectric Impedance Scanning

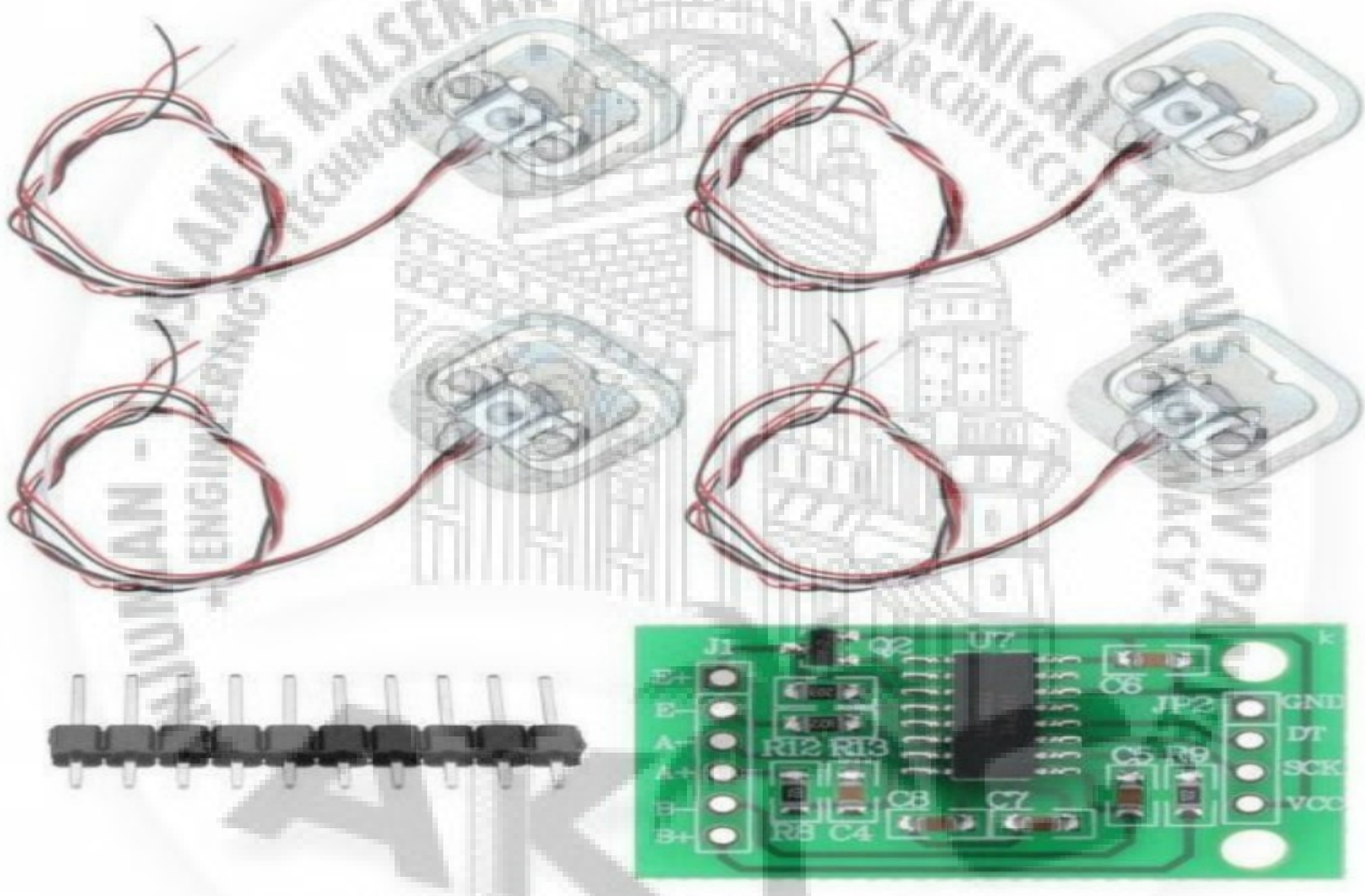


Electrical flow in the body (i.e., bioelectricity), plays a significant role in many physiological and pathophysiological conditions (health and disease). Nerves relay information and mediate body functions by transmitting electrical impulses: bioelectrical signals.

Bioelectricity *refers to electrical currents occurring within or produced by the human body.* ***Bioelectric currents*** *are generated by a number of different biological processes, and are used by cells to conduct impulses along nerve fibbers, to regulate tissue and organ functions, and to govern metabolism.*

Bioelectrical currents *(and potentials) of human tissue, recorded from the skin surface by electrocardiograph (E.C.G.), electroencephalograph (E.E.G.), electromyography (E.M.G.) and similar sensitive devices, are widely used in medicine to diagnose the condition of various vital organs.*

The most important difference between ***bioelectric current*** *flow in the living organisms and the type of electrical current used to produce light, heat, or power is that* ***bioelectrical current*** *is a flow of ions (atoms or molecules carrying an electric charge), while standard electricity is a movement of electrons.*



Weight sensor

A load cell is a type of transducer, specifically a force transducer. It converts a force such as tension, compression, pressure, or torque into an electrical signal that can be measured and standardized. As the force applied to the load cell increases, the electrical signal changes proportionally. The most common types of load cell used are hydraulic, pneumatic, and strain gauge. A load cell is a transducer that is used to create an electrical signal whose magnitude is directly proportional to the force being measured. The various types of load cells include hydraulic load cells, pneumatic load cells and strain gauge loadcells.

This is a standard load cell for measuring weight upto 200 Kg. The most common use of this sensor is in weighing machine. Every weighing machine which shows weight has a

loadcell as sensing element.

This conversion is indirect and happens in two stages. Through a mechanical arrangement, the force being sensed deforms a strain gauge. The strain gauge measures the deformation (strain) as an electrical signal, because the strain changes the effective electrical resistance of the wire. A load cell usually consists of four strain gauges in a Wheatstone bridge configuration. Load cells of one strain gauge (quarter bridge) or two strain gauges (half bridge) are also available.

The electrical signal output is typically in the order of a few millivolts and requires amplification by an instrumentation amplifier before it can be used. The output of the transducer is plugged into an algorithm to calculate the force applied to the transducer.

Chapter 4

Market Potential

As we can see everyone are health consious and want to be fit in life. This project will have a high demand as it will give personalized diet to everyone and help them to be fit. This system can be used in hospital , nutrition centres, gym, fitness centres. As we see in corporate life people become obese and overweight because of their lifestyle which result in low confident , less stamina, gets tired fast .

This can be avoided by getting fit which in result will help in good performance in work place as well as outside. So this system can be use in many firms which can help their employee to stay fit which in return will help improve their productivity of work. So this system has good market potential in commercial offices.

In gym and fitness centers they have to hire nutritionist and trainers to prepare their clients diet and routine. This system can help them remove the burden of nutritionist and help in reduction of human resource. There this system also has good market potential in the Fitness centers and gyms.

Being fit helps to avoid and prevent the diseases and illness. So this system can be used in hospitals and medical centres to help give patients with their diet and monitoring using this system.

Schools can install this systems to help keep their students fit and healthy. It can be used by every person of every age to help monitor their health and diet. So this system will have good market potential in every sectors.

Competitive Advantages of Project

This system can be used in every sector from hospitals,gym,fitness centers,nutrition centers, school,office etc. This system will help reduce the human resource of nutritionist and alone would be suffice to give supply to all the demands.

Chapter 5

Conclusion and Future Scope

Conclusion

This paper focuses on the design of the nutrition evaluation and monitoring system mainly from two part. First the parameter of the body are been measured using the hardware system . This values are then given to the software system which will run it to algorithm and generate various body analysis parameters and display it to user. This parameters values will be displayed with ideal normal values. To reduce this difference of the persons body parameter values to the ideal values the softeware will generate a diet charts accordingly .

Future Scope

When we will receive increased number of data this data can be used in machine learning module and with the help of artificial intelligence the required output can be obtained.

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```
Select male or female
 male - m
 female - f
m

Enter your height in centimeters
165

Enter your weight in kilograms
65

Enter your age in years
25

BMR is 1616.869995

BMI : 23.875114

Healthy weight : 63

you are overweight and have to loose 2 kgs of weight

Do u want a workout chart and diet chart to loose weight effectively
 Yes - y
 No - n
```

```
Do u want a workout chart and diet chart to loose weight effectively
 Yes - y
 No - n
y
Monday
Back day
Pullups          3*15
Latpull down     3*15-20
seated rows      3*15-20
One arm rows     3*15-20
Bentover row     3*15-20
Shrugs           3*15-20


Tuesday
Chest day
Flatpress        3*15-20
Incline press    3*15-20
Decline press    3*15-20
Pecdec           3*15-20
Dumbell flys     3*15-20
Pushups          3*10-15


Wednesday
Cardio and Abs
Jogging  20 minutes
Cycling  20 minutes
Jumping Jacks 5*50
Crunches 3*15-20
Leg raises 3*15-20


Thursday
Shoulders
Militry press     3*15-20
Overhead press    3*15-20
Front raises      3*15-20
Lateral raises    3*15-20
Reverse pecdec    3*15-20
Shrugs            3*15-20


Saturday
Legs
Squats           3*15-20
Lunges           3*15-20
Leg press        3*15-20
Leg extension    3*15-20
```

```
#include<stdio.h>
#include<math.h>
//BMR = 66.5 + ( 13.75 × weight in kg ) + ( 5.003 × height in cm ) – ( 6.755 × age in years )
int  workout(int q,int w);
int diff(int a,int b,int c);
int main()
{
    int height,age,healthy,difference,i,input;
    char c,d;
    float weight,bmr,bmi;
    do
{ //inputs of data
 printf("Select male or female\n male - m\n female - f\n");
scanf("%c",&c);
printf("\nEnter your height in centimeters\n");
scanf("%d",&height);
printf("\nEnter your weight in kilograms\n");
scanf("%f",&weight);
printf("\nEnter your age in years\n");
scanf("%d",&age);
if(c=='m')
{
   // bmr and checking for male
bmr=66.5+(13.75*weight)+(5.003*height)-(6.755*age) ;
bmi=((weight/(height*height)))*10000;
printf("\nBMR is %f\n",bmr);
printf("\nBMI : %f\n",bmi);
if(height<157)
{
    healthy=58;
   diff(healthy,weight,difference);

}
else if(height>=157 && height<=160)
{
    healthy=59;
    diff(healthy,weight ,difference);
}
else if(height>=161&&height<=162)
{
    healthy=61;
    diff(healthy,weight,difference);

}
else if(height>=163&&height<=165)
{
    healthy=63;
    diff(healthy,weight,difference);
}
else if(height>=166&&height<=167)
{
    healthy=64;
    diff(healthy,weight,difference);
}
else if(height>=168&&height<=170)
{
```

```
    healthy=66;
    diff(healthy,weight,difference);
}
else if(height>=171&&height<=173)
{
    healthy=68;
    diff(healthy,weight,difference);
}
else if(height>=174&&height<=175)
{
    healthy=70;
    diff(healthy,weight,difference);
}
else if(height>=176&&height<=178)
{
    healthy=73;
    diff(healthy,weight,difference);
}
else if(height>=179&&height<=180)
{
    healthy=76;
    diff(healthy,weight,difference);

}
else if (height>=181&&height<=182)
{
    healthy=78;
    diff(healthy,weight,difference);

}
else if(height>=183&&height<=188)
{
    healthy=80;
    diff(healthy,weight,difference);
}
}
else if(c=='f')
{
    //bmr and checking for female
    //BMR = 655.1 + ( 9.563 × weight in kg ) + ( 1.850 × height in cm ) – ( 4.676 × age in years )
     bmr=655.1+(9.653*weight)+(1.850*height)-(4.676*age);
     bmi=((weight/(height*height)))*10000;

printf("\nBMI : %f\n",bmi);
printf("\nBMR is %f\n",bmr);
if(height<157)
{
    healthy=54;
   diff(healthy,weight,difference);

}
else if(height>=157 && height<=160)
{
    healthy=56;
    diff(healthy,weight ,difference);
}
```

```
else if(height>=161&&height<=162)
{
    healthy=58;
    diff(healthy,weight,difference);

}
else if(height>=163&&height<=165)
{
    healthy=60;
    diff(healthy,weight,difference);
}
else if(height>=166&&height<=167)
{
    healthy=62;
    diff(healthy,weight,difference);
}


else if(height>=168&&height<=170)
{
    healthy=63;
    diff(healthy,weight,difference);
}
else if(height>=171&&height<=173)
{
    healthy=65;
    diff(healthy,weight,difference);
}
else if(height>=174&&height<=175)
{
    healthy=66;
    diff(healthy,weight,difference);
}
else if(height>=176&&height<=178)
{
    healthy=70;
    diff(healthy,weight,difference);
}
else if(height>=179&&height<=180)
{
    healthy=71;
    diff(healthy,weight,difference);

}
else if (height>=181&&height<=182)
{
    healthy=75;
    diff(healthy,weight,difference);

}
else if(height>=183&&height<=188)
{
    healthy=78;
    diff(healthy,weight,difference);
}
```

```
}
 workout(healthy,weight);
 scanf(" %c",&d);
  if(d=='y')
{
   if(c=='m'&&healthy>weight)


    {
        printf("Monday\n"
"Chest day\n"
"Variation          Sets          Reps\n"
"Flat chest press       3            8-12\n"
"Incline chest press     3            8-12\n"
"Decline chest press      3            8-12\n"
"Pec dec          3          8-12\n"
"Pushups          3          6-10\n"
"\n"
"Tuesday\n"
"Back day\n"
"Variation

\n"
"Pullups

"Latpulldown

"Seated rows

"One arm row

12\n"
"Bentover rows

12\n"
"\n"
"\n"
"Wednesday\n"
"Rest day\n"
"\n"
"\n"
"Thursday\n"
"Shoulder day\n"
"\n"
"Variation

\n"
"Militrypress

"Overhead press

"Front raises

"Lateral raises

"Shrugs
```

```
Sets
Reps

3
4-10\n"
3
8-12\n"
3
8-12\n"
   3
10-

3
10-
```

```
15\n"
"\n"
"\n"
"\n"
"Friday\n"
"Biceps and Triceps\n"
"Variation
Sets                                Reps\n"
"Bicep curl(bar)                    3
                                    8-12\n"
"Bicep curl(dumbbell)
3                                   8-12\n"
"Preacher curl
3                                   12\n"
"Tricep pushdown                    3
                                    8-12\n"
"Kickback
3                                   8-12\n"
"\n"
"\n"
"Saturda\n"
"Legs \n"
"Variation
sets                                Reps
\n"
"Squats
3      20\n"
"Leg press                          3
12-15\n"
"Lunges
3                                   12\n"
"Let extension                      3
12-15\n"
"Standing calf raises               3
12-15\n"

          );
       }
       else if(c=='f'&&healthy>weight)
   {
    printf("Monday \n"
"Upper body\n"
"Variation                          Set
                                    Reps\n"
"Lat pulldown                       3
                                    10-
12\n"
"Seated rows                        3
                                    10-
12\n"
"Flatchespress                      3
                                    10-
12\n"
"Pecdec                             3
                                    10-
12\n"
```

```
"Pushups                                                    3
                                                            12-

12\n"
"\n"
"\n"
"Tuesday \n"
"Lower body\n"
"Variation                                                  Set
                                                            Reps\n"
"Squats                                                     3
                                                            20\n"
"Lunges                                                     3
                                                            12-

15\n"
"Leg press                                                  3
                                                            12-

15\n"
"Leg extension                                              3
                                                            12-

15\n"
"Calf raises                                                3
                                                            12-

15\n"
"\n"
"\n"
"Wednesday\n"
"Cardio and abs\n"
"Jogging 20 minutes\n"
"Cycling 15 minutes\n"
"Jumping jacks 50*3\n"
"Crunchers 15*3\n"
"Leg raises 15*3\n"
"\n"
"Thursday\n"
"Rest day\n"
"\n"
"Friday\n"
"Same as Monday\n"
"\n"
"Saturday\n"
"Same as Tuesday\n"
"\n\n\n\Sample DIET\n"

);
}

else if(c=='m'&&healthy<weight)
{
    printf("Monday\n"
           "Back day\n"
           "Pullups        3*15\n"
           "Latpull down   3*15-20\n"
           "seated rows    3*15-20\n"
           "One arm rows   3*15-20\n"
           "Bentover row   3*15-20\n"
           "Shrugs         3*15-20\n"
```

```
"\n"
"\n"
"Tuesday\n"
"Chest day\n"
"Flatpress      3*15-20\n"
"Incline press  3*15-20\n"
"Decline press  3*15-20\n"
"Pecdec         3*15-20\n"
"Dumbell flys   3*15-20\n"
"Pushups        3*10-15\n"
"\n"
"\n"
"Wednesday\n"
"Cardio and Abs\n"
"Jogging  20 minutes\n"
"Cycling  20 minutes\n"
"Jumping Jacks 5*50\n"
"Crunches 3*15-20\n"
"Leg raises 3*15-20\n"
"\n"
"\n"
"Thursday\n"
"Shoulders\n"
"Militry press    3*15-20\n"
"Overhead press   3*15-20\n"
"Front raises     3*15-20\n"
"Lateral raises   3*15-20\n"
"Reverse pecdec   3*15-20\n"
"Shrugs           3*15-20\n"
"\n"
"\n"
"Saturday\n"
"Legs\n"
"Squats         3*15-20\n"
"Lunges         3*15-20\n"
"Leg press      3*15-20\n"
"Leg extension  3*15-20\n"
"Calf raises    3*15-20\n"
"\n"
"\n"
"Sunday\n"
"Restday\n"
"\n\n\n\Sample DIET\n");
}
else if(c=='f'&&healthy<weight)
{
   printf("Monday\n"
         "Back day\n"
         "Pullups        3*15\n"
         "Latpull down   3*15-20\n"
         "seated rows    3*15-20\n"
         "One arm rows   3*15-20\n"
         "Bentover row   3*15-20\n"
         "Shrugs         3*15-20\n"
         "\n"
         "\n"
```

```
"Tuesday\n"
"Chest day\n"
"Flatpress      3*15-20\n"
"Incline press  3*15-20\n"
"Decline press  3*15-20\n"
"Pecdec         3*15-20\n"
"Dumbell flys   3*15-20\n"
"Pushups        3*10-15\n"
"\n"
"\n"
"Wednesday\n"
"Cardio and Abs\n"
"Jogging  20 minutes\n"
"Cycling  20 minutes\n"
"Jumping Jacks 5*50\n"
"Crunches 3*15-20\n"
"Leg raises 3*15-20\n"
"\n"
"\n"
"Thursday\n"
"Shoulders\n"
"Militry press    3*15-20\n"
"Overhead press   3*15-20\n"
"Front raises     3*15-20\n"
"Lateral raises   3*15-20\n"
"Reverse pecdec   3*15-20\n"
"Shrugs           3*15-20\n"
"\n"
"\n"
"Saturday\n"
"Legs\n"
"Squats        3*15-20\n"
"Lunges        3*15-20\n"
"Leg press     3*15-20\n"
"Leg extension  3*15-20\n"
"Calf raises    3*15-20\n"
"\n"
"\n"
"Sunday\n"
"Restday\n"
"\n\n\n\Sample DIET\n");
}
}
else
    {
        printf("thankyou\n");
    }


printf("\nif want to check again press 1\n");
scanf("%d",&input);
    }
while(input==1);
}
```

```
//function for overweight and underweight

int diff(int healthy ,int weight ,int difference)
    {

        printf("\nHealthy weight : %d\n",healthy);
        if(healthy>weight)
            { difference=healthy-weight;
                printf("\nyou are underweight and have to gain %d kgs of weight\n",difference);
            }
            else if(healthy<weight)
            {
                difference=weight-healthy;
                printf("\nyou are overweight and have to loose %d kgs of weight\n",difference);

            }
            else
            {
                printf("\nyou are perfectly fit\n");
            }


}
int workout(int healthy,int weight)
{
    if(healthy>weight)
    {
        printf("\nDo u want a workout chart and diet chart to gain weight effectively\n Yes - y\n No - n\n");

    }
    else if(healthy<weight)
    {
        printf("\nDo u want a workout chart and diet chart to loose weight effectively\n Yes - y\n No - n \n");
    }
}
```