RV Educational Institutions ®
RV College of Engineering ®

Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi

Approved by AICTE, New Delhi, Accredited By NAAC, Bengaluru And NBA, New Delhi

Go, change the world

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

Operating System Assignment
18MCA24

Submitted in partial fulfillment of the requirements for the award of degree of

MASTER OF COMPUTER APPLICATONS

By

CHAITRA BV
(USN: 1RV19MCA21)

Under the Guidance
Of

Dr Savitha.R

2019-2020

RV COLLEGE OF ENGINEERING®,

(Autonomous Institution Affiliated to Visvesvaraya Technological University, Belagavi)

DEPARTMENT OF

MASTER OF COMPUTER APPLICATIONS

Bengaluru– 560059

CERTIFICATE

Certified that the Assignment titled **"MICROWAVE SYSTEM"** carried out by **CHAITRA BV, USN:** 1RV19MCA21, a bonafide student of **RV College of Engineering, Bengaluru** submitted in partial fulfilment for the award of **Master of Computer Applications** of **RV College of Engineering, Bengaluru affiliated to Visvesvaraya Technological University, Belagavi** during the year **2019-20**. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The report has been approved as it satisfies the partial academic requirement in respect of the course Operating System 18MCA24.

Dr Savitha.R
Assistant Prof,
Department of MCA
RVCE, Bengaluru –59

ACKNOWLEDGEMENT

We are happy to present this Assignment after completing it successfully. This Assignment would not have been possible without the guidance, assistance and suggestions of many individuals. We would like to express our deep sense of gratitude and indebtedness to each and every one who has helped us make this Assignment a success.

We heartily thank our Head of Department Dr.Andhe Dharani, Dept. of MASTER OF COMPUTER APPLICATION for her constant encouragement and inspiration in taking up this Assignment.

We gracefully thank our Assignment guide, Dr Savitha.R, Asst. Prof, Dept. of MASTER OF COMPUTER APPLICATION, for her encouragement and advice throughout the course of the Assignment work.

Special thanks to all the staff members of Information Science Department for their help and kind co-operation.

Lastly, we thank our parents and friends for their encouragement and support given to us in order to finish this precious work.

By:

CHAITRA BV(1RV19MCA21)

TABLE OF CONTENTS

ABSTRACT

Microwaves refer to the electromagnetic waves in the frequency range of 300MHz to 300GHz. Once microwave energy is absorbed, polar molecules and ions inside the food will rotate or collide according to the alternating electromagnetic field and heat is subsequently generated for cooking. The use of microwave oven provides a convenient way to thaw, cook and reheat foods. However, the safety of the microwaved food has on and off aroused some public interest. This report reviewed the basic principles, structure and characteristics of microwave heating. The biological effect and safety on users is also examined.

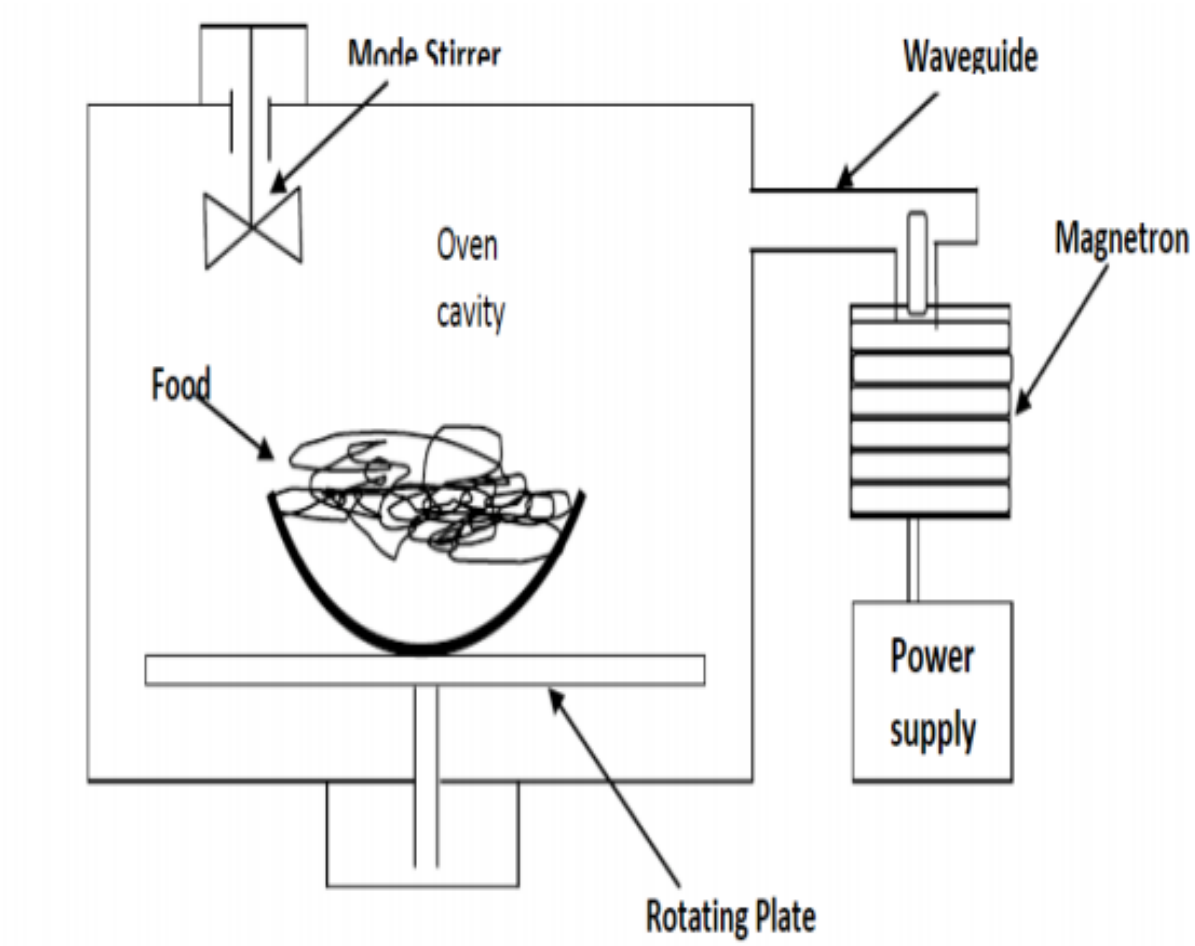
INTRODUCTION

When cook, we have to heat something to eat with fire. But today, we can cook easily by using a microwave oven. Instead of heating food products, we just push the button. Though everyone knows how to use it, it is hard to find someone who knows how it works. Because of its name we just know that it uses microwaves. Originally, microwaves were principally used for communication. In 1950, the use of microwave energy to heat materials was discovered. Now microwave ovens have become common for heating food products in the home. The most prominent characteristic of microwave heating is volumetric heating, which is quite different from conventional heating where the heat must diffuse in from the surface of the material. Volumetric heating means that materials can absorb microwave energy directly and internally and convert it to heat. It is this characteristic that leads to advantages using microwaves to process materials. Now we present more detailed characteristics of microwave heating.

Microwaves are a form of electromagnetic energy, like light waves or radio waves, and occupy a part of the electromagnetic spectrum. All wave energy changes polarity from positive to negative with each cycle of the wave. In microwaves, these polarity changes happen millions of times every second. Food molecules - especially the molecules of water - have a positive and negative end, in the same way a bar magnet has a north and a south pole. When microwaves at the right frequency bombard food, they cause the polar molecules to rotate at the same frequency, millions of times a second. All this agitation on the molecular level creates friction, which heats up the food. Because microwaves don't interact with molecules of glass, plastic or paper, only the food is heated.

BASIC STRUCTURE OF MICROWAVE

A microwave oven is relatively simple system consisting of a high power source, a wave guide feed, and the oven cavity. The source is generally a magnetron tube operating at 2.45GHZ. Although 915MHZ is sometimes used when greater penetration is desired. Power output is usually between 500 and 1500W. The oven cavity has metallic walls, and is electrically large. To reduce the effect of uneven heating caused by standing waves in the oven, a mode stirrer, which is just a metallic fan blade, is used to perturb the field distribution inside the oven with a motorized platter. The food is also rotated with a motorized plate.



HOW A MICROWAVE OVEN WORKS

A microwave oven works as follows:

1. Electrical energy, in the form of low-voltage alternating current and high-voltage direct current, is transformed and converted into direct current.

2. A magnetron uses this direct current and generates microwaves with a frequency of 2450 megacycles per second or 2.45 GHz (gigahertz).

3. The microwaves are directed by an antenna at the top of the magnetron into a waveguide.

4. The waveguide channels microwaves to a fanlike device called a stirrer which disperses them inside the oven cavity.

5. The microwaves then reflect off the metal walls of the oven's interior and are absorbed by molecules in the food.

6. Because each wave has a positive and negative component, the molecules in the food are jostled back and forth at twice the rate of the microwave frequency, namely 4.9 billion times a second.

CODE SNIPPET

```
import java.awt.*;
import java.applet.*;
import java.awt.event.*;
import java.lang.Thread;
public class Microwave extends Applet {
// declare the Buttons and the Canvas
 Button Button1;
 Button Button2;
 Button Button3;
 Button Button4;
 Button Button5;
 Button Button6;
 Button ButtonConfigure;
 TextField Display;
 int Counter;
 myCounter counterthread;
 Frame frame;
 boolean countdown = false;
 Checkbox printIt;
 Choice powerSetting;
 Panel heatPanel;
 Panel sillyChoicePanel;
 CheckboxGroup wavelengthGroup;
 Checkbox microwave;
 Checkbox infrared;
 Checkbox gamma;
```

```
public void init(){
// Setup our Grid layout
setLayout(new GridLayout(3, 4));

//initialize and instantiate buttons and canvas
Button1 = new Button("cook");
Button2 = new Button("clear");
Button3 = new Button("frozen");
Button4 = new Button("quick");
Button5 = new Button("potato");
Button6 = new Button("bev");
ButtonConfigure = new Button("Configure");
Display = new TextField("0", 5);
add(Button1);
add(Button2);
add(Button3);
// This adds in a blank space in the grid.
add(new Label());
add(Button4);
add(Button5);
add(Button6);
add(Display);
add(new Label());
add(ButtonConfigure);
Button1.addMouseListener(new myTimingListener());
Button2.addMouseListener(new myTimingListener());
Button3.addMouseListener(new myTimingListener());
```

```
Button4.addMouseListener(new myTimingListener());
Button5.addMouseListener(new myTimingListener());
Button6.addMouseListener(new myTimingListener());
ButtonConfigure.addMouseListener(new myConfigListener());

//instantiate and start counter thread

counterthread = new myCounter();
counterthread.start();
}
class configListener implements WindowListener {
// we need this for the Window Listener interface,
// but for the most part, we don't care about them.
public void windowDeactivated(WindowEvent e) {
}
public void windowClosed(WindowEvent e) {
}
public void windowDeiconified(WindowEvent e) {
}
public void windowOpened(WindowEvent e) {
}
public void windowIconified(WindowEvent e) {
}
public void windowActivated(WindowEvent e) {
}
public void windowClosing(WindowEvent e) {
if (printIt.getState()) {
```

```
System.out.println("You want me to use heat setting:");
System.out.println(powerSetting.getSelectedItem());
System.out.println("and you want me to use EM wavelength:");
if (microwave.getState())
 System.out.println("microwave");
if (infrared.getState())
 System.out.println("infrared");
if (gamma.getState())
 System.out.println("gamma");
 }
 frame.setVisible(false);
}
 }
 class myCounter extends Thread{
 public void run(){
 int counter;
 while(true)
 {
 while (countdown)
 {
 counter = Integer.parseInt(Display.getText());
 counter--;
 if (counter > 0)
 {
 Display.setText(Integer.toString(counter));
 try {Thread.sleep(1000);}
 catch(InterruptedException ie) { countdown = false;
```

```
}
 }
 else
 {
 Display.setText("0");
 countdown = false;
 }
 }
 try {Thread.sleep(100);}
 catch(InterruptedException ie) {}
 }
 }
 }

 class myTimingListener implements MouseListener{
 public void mouseClicked(MouseEvent e){
 if(e.getSource()==Button1)
 countdown = true;
 else
 {
 if(e.getSource()==Button2)
 Counter = 0;
 if(e.getSource()==Button3)
 Counter = 60;
 if(e.getSource()==Button4)
 Counter = 30;
 if(e.getSource()==Button5)
```

```
Counter = 50;
if(e.getSource()==Button6)
Counter = 45;

Display.setText(Integer.toString(Counter));
}
}

public void mouseEntered(MouseEvent e){};
public void mouseExited(MouseEvent e){};
public void mousePressed(MouseEvent e){};
public void mouseReleased(MouseEvent e){};
}
class myConfigListener implements MouseListener{
public void mouseClicked(MouseEvent e){
frame = new Frame();
// respond to the events
frame.addWindowListener(new configListener());
frame.setSize(400,125);
frame.setLayout(new BorderLayout());
printIt = new Checkbox("Output result to stdout?");
frame.add("North", printIt);
heatPanel = new Panel();
frame.add ( "Center", heatPanel );
heatPanel.add(new Label("Set Heat Level:"));
powerSetting = new Choice();
powerSetting.add("Replicate Big Bang Conditions");
```

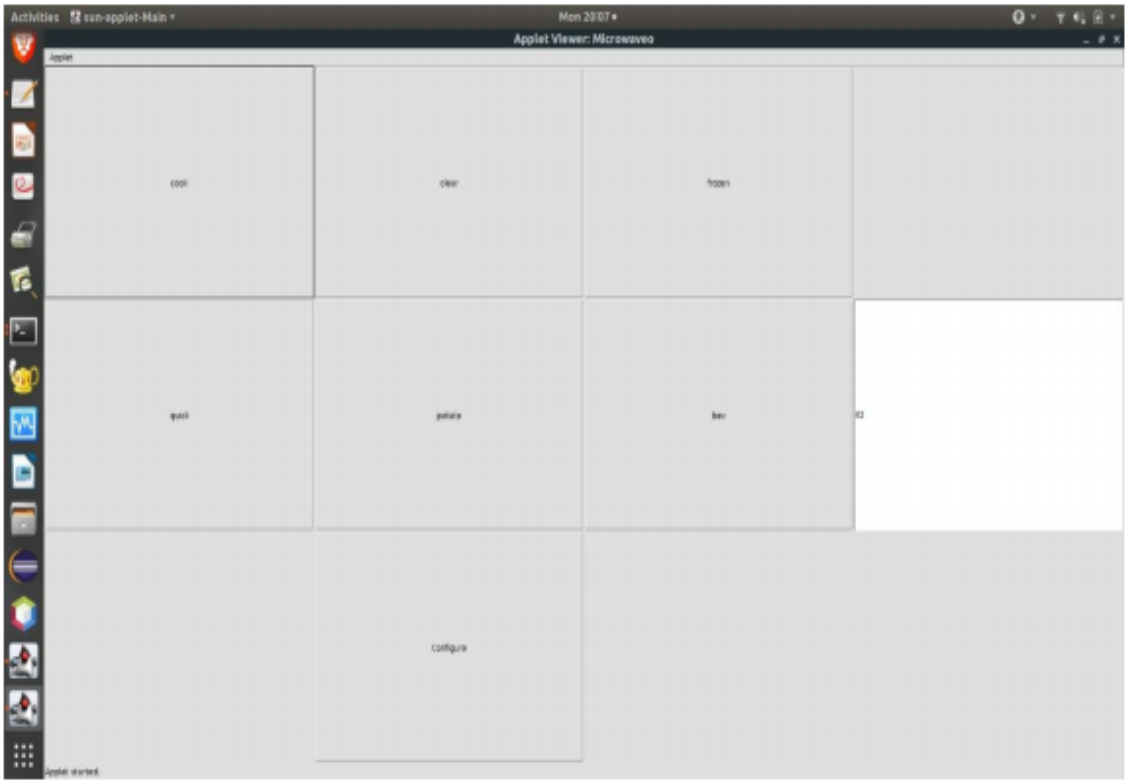
```
powerSetting.add("Induce Gluon Spaghetti");
powerSetting.add("Plasmify");
powerSetting.add("Vaporize");
powerSetting.add("Carbonize");
powerSetting.add("Sear");
powerSetting.add("Boil");
powerSetting.add("Really Hot");
powerSetting.add("Warm");
powerSetting.add("Tepid");
powerSetting.add("Lightly Warm");
powerSetting.add("Just whir and turn on the light");
powerSetting.select("Warm");
heatPanel.add(powerSetting);
sillyChoicePanel = new Panel();
sillyChoicePanel.setLayout(new FlowLayout());
sillyChoicePanel.add(new Label("Select spectrum:"));
wavelengthGroup = new CheckboxGroup();
microwave = new Checkbox("Microwave", wavelengthGroup, true);
infrared = new Checkbox("Infrared", wavelengthGroup, false);
gamma = new Checkbox("Gamma", wavelengthGroup, false);
sillyChoicePanel.add(microwave);
sillyChoicePanel.add(infrared);
sillyChoicePanel.add(gamma);
frame.add("South", sillyChoicePanel );
frame.setVisible(true);
 }
```

```
public void mouseEntered(MouseEvent e){};
public void mouseExited(MouseEvent e){};
public void mousePressed(MouseEvent e){};
public void mouseReleased(MouseEvent e){};
}

}
```

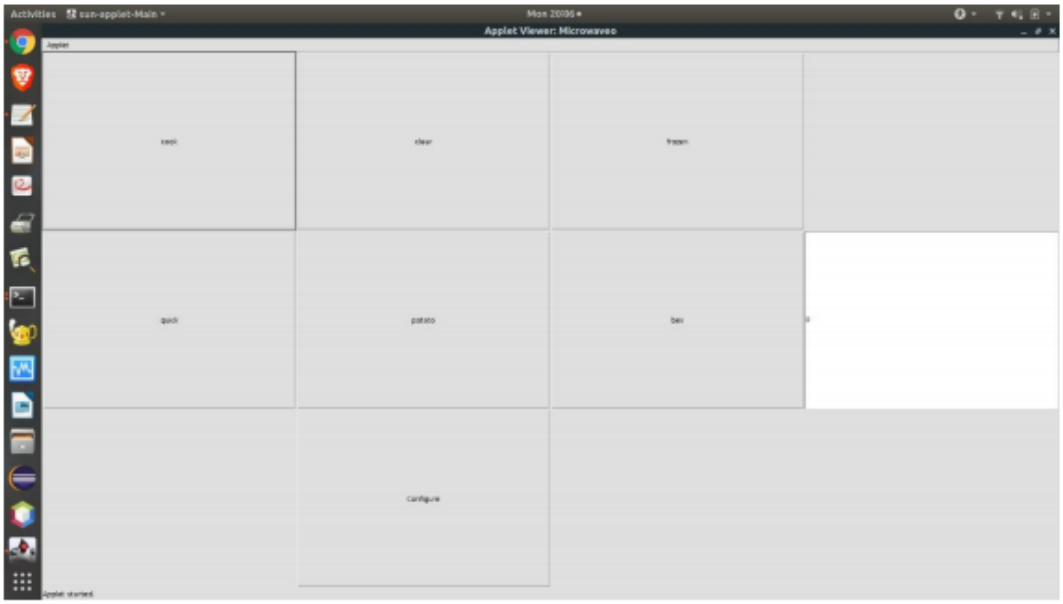
SCREEN SHOTS

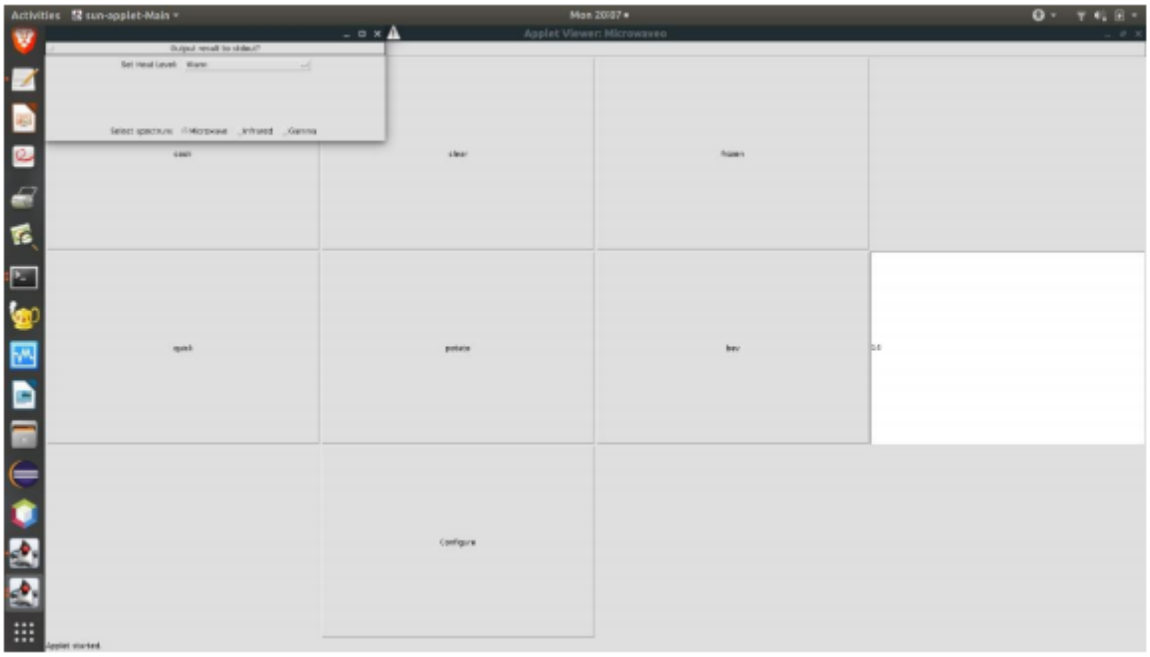
This is an java based application and we have used the applet code to work it as an microwave system. We have added 7 command buttons and 1 textfeild by using a gridLayout. And when the system is not in use then the field value will be set to “Zero”.

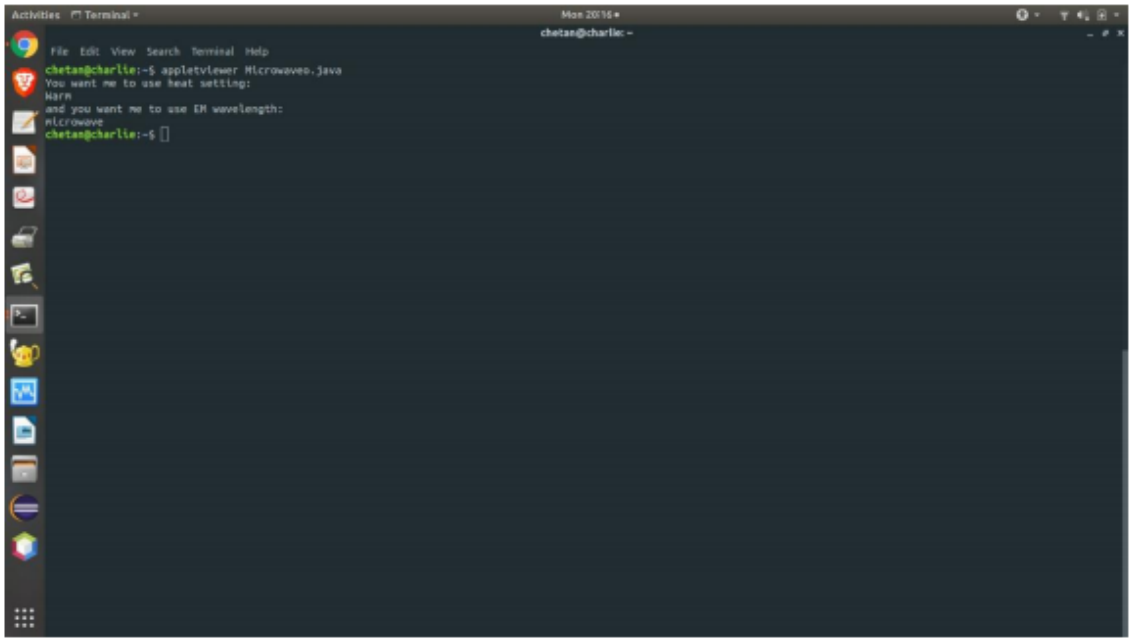


Now when the user starts to operate the microwave system then he need set the start time with ‘X’ milliseconds, and when the user starts for cook then the operation starts and the time will be keep on reducing by 1milliseconds.

Then, when the user clicks on clear then the time will be cleared and set to “Zero”.


Activities
sun-applet-Main
Applet Viewer: Microwaveo
Applet
root
clear
frozen
quick
potato
bev
configure
Applet started.


Activities
sun-applet-Main
Applet Viewer: Microwaveo
clear
frozen
quick
potato
bev
Configure
Applet started.


Activities
Terminal
Mon 20:16
chetan@charlie: ~
File Edit View Search Terminal Help
chetan@charlie:~$ appletviewer Microwaveo.java
You want me to use heat setting:
Warm
and you want me to use EM wavelength:
microwave
chetan@charlie:~$

CONCLUSION

The successful applications of microwave heating technology for processing of various foods have been discussed in the present report. The microwave heating technology for pasteurization and sterilization contributed to effectively destroy pathogenic microorganisms and significantly reduce processing time without serious damage in overall quality of liquid food as compared to traditional methods. The use of microwave heating for food processing applications such as blanching, cooking, and baking has a great effect on the preservation of nutritional quality of food. Microwave technology is now being seriously considered as a viable energy source in process heating. It’s been a slow development process over the last two centuries.