### Introduction

WAP is an international standard establishing how mobile devices can access information on the Internet. It is a widely used set of protocols used on wireless devices such as mobile phones

WAP is the worldwide standard for providing Internet communications and advanced telephony services on digital mobile phones, pagers, personal digital assistants, and other wireless terminals – *WAP Forum*.

WAP stands for Wireless Application Protocol. The dictionary definition of these terms are as follows –

- Wireless Lacking or not requiring a wire or wires pertaining to radio transmission.
- **Application** A computer program or piece of computer software that is designed to do a specific task.
- **Protocol** A set of technical rules about how information should be transmitted and received using computers.

# WAP-WML Syntax

The topmost layer in the WAP architecture is made up of WAE (Wireless Application Environment), which consists of WML and WML scripting language.

WML scripting language is used to design applications that are sent over wireless devices such as mobile phones. This language takes care of the small screen and the low bandwidth of transmission. WML is an application of XML, which is defined in a document-type definition.

WML pages are called decks. They are constructed as a set of cards, related to each other with links. When a WML page is accessed from a mobile phone, all the cards in the page are downloaded from the WAP server to mobile phone showing the content.

WML commands and syntaxes are used to show content and to navigate between the cards. Developers can use these commands to declare variables, format text, and show images on the mobile phone.

# WAP Program Structure

A WML program is typically divided into two parts – the **document prolog** and the **body**. Consider the following code –

The first line of this text says that this is an XML document and the version is 1.0. The second line selects the document type and gives the URL of the **document type definition** (DTD). This DTD gives the full XML definition of WML. The DTD referenced is defined in WAP 1.1, but this header changes with the versions of the WML. The header must be copied exactly so that the tool kits automatically generate this prolog.

The body is enclosed within a <wml>...</wml> tag pair as shown above. The body of a WML document can consist of one or more of the following -

- Deck
- Card
- Content to be shown
- Navigation instructions

#### **WML Commands**

The commands used in WML are summarized as follows -

#### **Formatting**

| Command  | Description         |
|--|---------------------|
| <  | Paragraph           |
| <b></b>  | Bold                |
| <br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br><br> | Large               |
| <em></em>  | Emphasized          |
| <i></i>  | Italicized          |
| <small></small>  | Small               |
| <strong></strong>  | Strongly Emphasized |
| <u></u>  | Underlined          |
| <br>br>  | Line Break          |

#### **Inserting Images**

<img src="image-path/image - name" alt="Picture not available" />

| Command         | Description           |
|-----------------|-----------------------|
|                 | Definition of a table |
|                 | Defining a row        |
|                 | Defining a column     |
| <thead></thead> | Table header          |

#### Variables

#### Declared as -

```
<setvar name="x" value="xyz"/>
```

#### Used as -

- \$ identifier or
- \$ (identifier) or
- \$ (Identifier; conversion)

#### **Forms**

| Command               | Description                                  |
|-----------------------|--|
| <select></select>     | Define single or multiple list               |
| <input/>              | Input from user                              |
| <option></option>     | Defines an option in a selectable list       |
| <fieldset></fieldset> | Defines a set of input fields                |
| <optgroup></optgroup> | Defines an option group in a selectable list |

#### **Task Elements**

| Command             | Description  |
|---------------------|--|
| <go></go>           | Represents the action of switching to a new card         |
| <noop></noop>       | Says that nothing should be done                         |
| <prev></prev>       | Represents the action of going back to the previous card |
| <refresh></refresh> | Refreshes some specified card variables.                 |

#### **Events**

The various events are as follows –

| Command                           | Description                       |
|-----------------------------------|-----------------------------------|
| <do></do>                         | Defines a do event<br>handler     |
| <onevent></onevent>               | Defines an onevent event handler  |
| <postfield></postfield>           | Defines a postfield event handler |
| <ontimer></ontimer>               | Defines an ontimer event handler  |
| <onenterforward></onenterforward> | Defines an onenterforward handler |

| <onenterbackward></onenterbackward> | Defines an onenterbackward handler |
|-------------------------------------|------------------------------------|
| <onpick></onpick>                   | Defines an onpick event handler    |

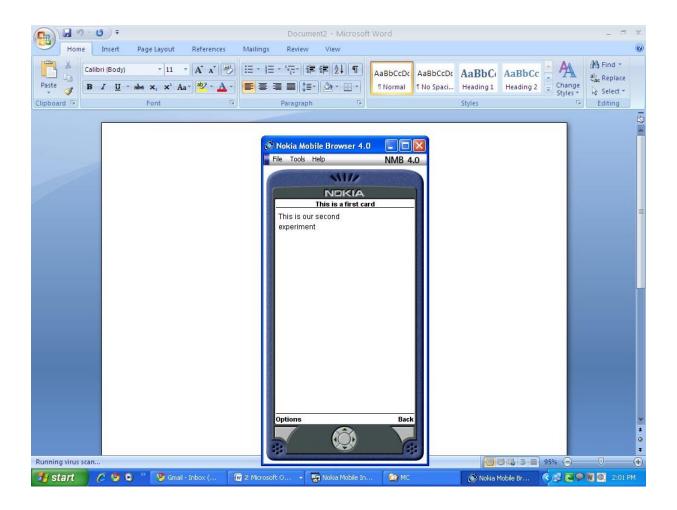
# **Experiment No. 1**

Aim: - Write a Program to create line break in WML

**Requirements:** - Nokia Mobile Internet toolkit

### **Code**

```
<? Xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
   "http://www.wapforum.org/DTD/wml13.dtd">
   <wml>
   <card id="MainCard" title="This is a first card">
   This is our second <br/>experiment
</card>
</wml>
```



# **Experiment No-2**

**AIM:** Write a program in WML to illustrate the font size.

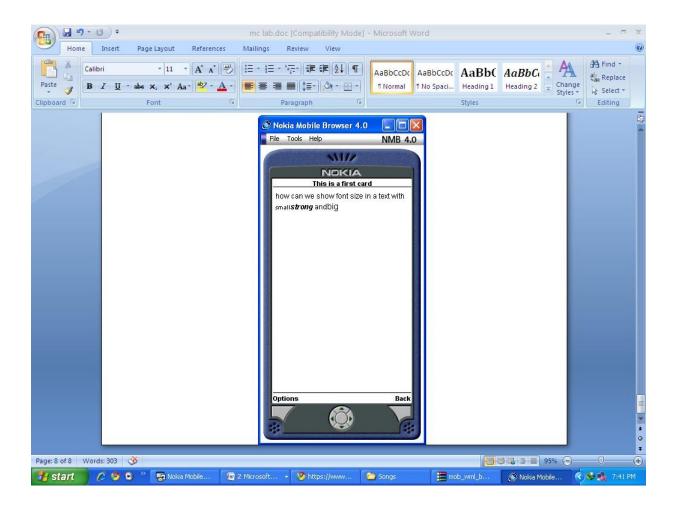
**Requirements:** - Nokia Mobile internet Toolkit.

### **Code**

```
<? xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
    "http://www.wapforum.org/DTD/wml13.dtd">
    <wml>

    <card id="MainCard" title="This is a first card">
    how can we show font size in a text with
    <small>small</small>
    <i><i><strong>strong</si></i></i></i></or>

</card>
</wml>
```



# **Experiment No. 3**

**Aim**:- Program to make a table in the WML card.

Requirements:- Nokia Mobile internet Toolkit.

2

3

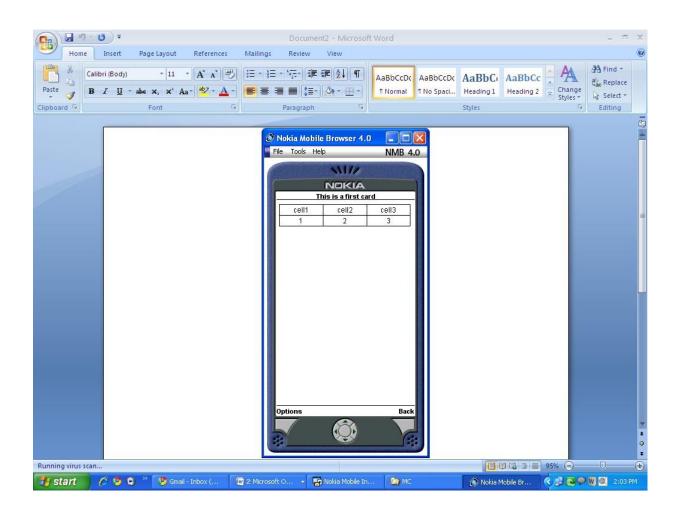
<u></u>

```
Code:
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"</pre>
"http://www.wapforum.org/DTD/wml13.dtd">
<u><wml></u>
<!-- THIS IS THE FIRST CARD IN THE DECK -->
<card id="pooja" title="This is a first card">
<u></u>
cell1
cell2
cell3
<u></u>
<u></u>
1
```

<u></u>

</card>

</wml>



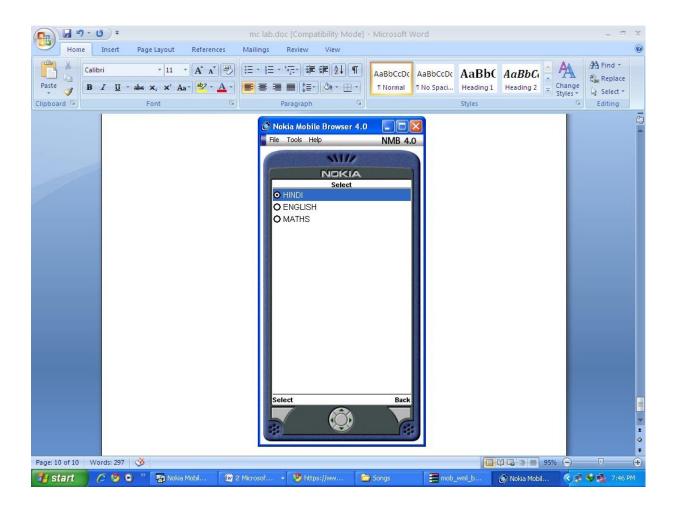
# **Experiment No-4**

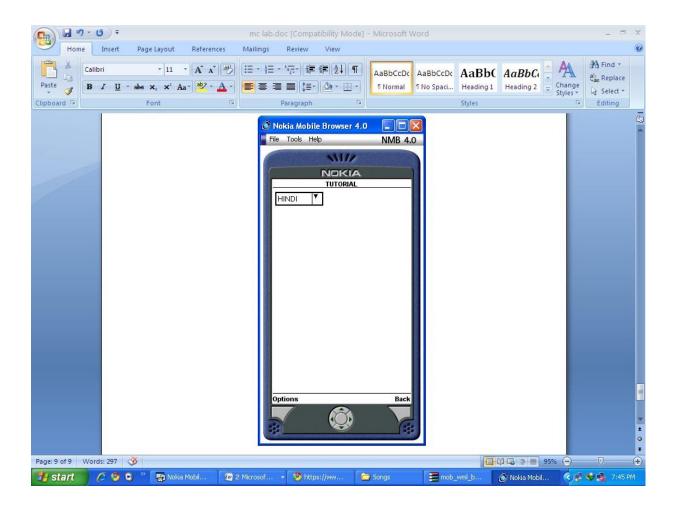
AIM: Write a program with two cards one for user input and other for displaying the result.

Requirements:- Nokia Mobile internet Toolkit.

#### CODE:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
 <card id="CARD1" title="TUTORIAL">
>
                   <do type="ACCEPT" label="MY_SUBJECT">
                   <go href="#CARD2"/>
                   </do>
                   <select name="NAME">
                   <option value="Hindi">HINDI </option>
                   <option value="English">ENGLISH</option>
                   <option value="Maths">MATHS</option>
                   </select>
</card>
<card id="CARD2" title="MY_SUBJECT">
 YOU SELECTED: $(NAME)
</card></wml>
```



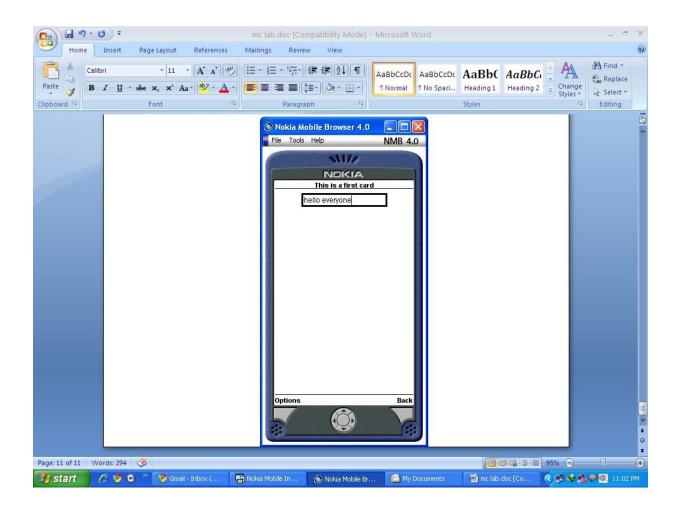


# **Experiment No. 5**

**Aim**:- Write a Program to introduce input box in a WML form.

Requirements:- Nokia Mobile internet Toolkit.

### Code



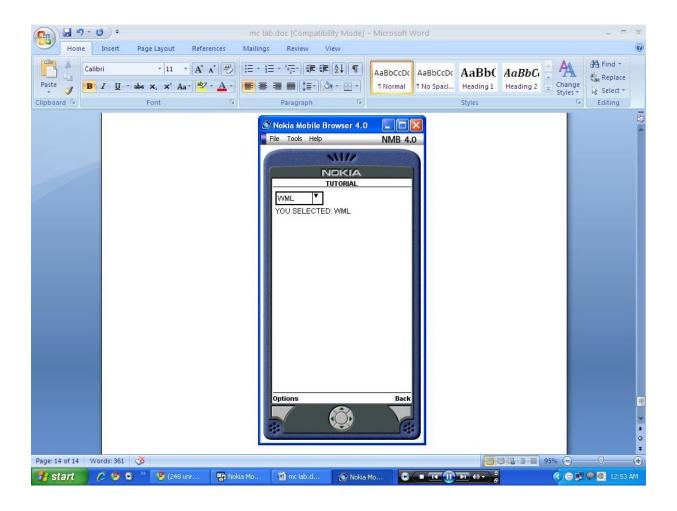
# **Experiment No. 6**

**Aim**:- Write a Program to a variable and its value in WML form.

Requirements:- Nokia Mobile internet Toolkit.

### Code:

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
 <card id="CARD1" title="TUTORIAL">
>
                   <select name="NAME">
                   <option value="WML">WML </option>
                   <option value="HTML">HTML</option>
                   <option value="Xml">XML</option>
                   </select>
       <do type="ACCEPT" label="MY_SUBJECT">
                   <go href="#CARD1"/>
                   </do>
          YOU SELECTED: $(NAME)
</card>
</wml>
```



# Experiment No. 7

Aim:- Write a program to perform navigation between WML cards (forward and backward both)

Requirements: - Nokia Mobile internet Toolkit.

### Code:

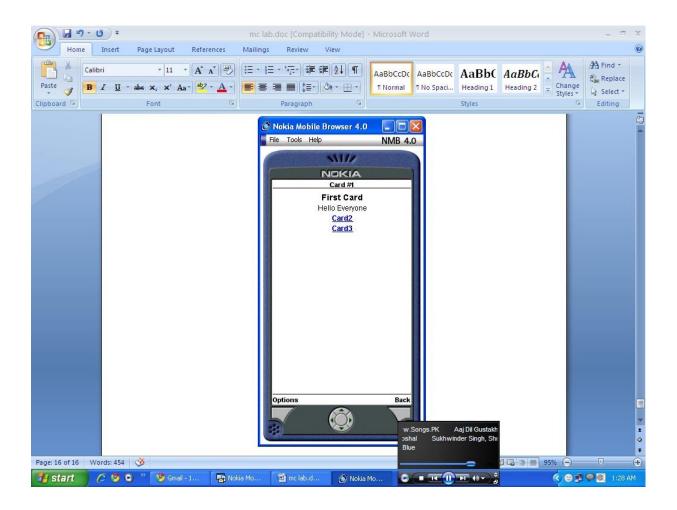
```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
 <card id="c1" title="Card #1">
 <br/><br/>big><b>First Card</b></big><br/>
Hello Everyone<br/>
<a href="#c2">Card2</a><br/>
<a href="#c3">Card3</a><br/>
 </card>
<card id="c2" title="Card #2">
   <br/>
<br/>
big><b>Second
Card</b></big><br/>Velcome to
WML<br/>
<a href="#c1">Back</a><br/>
<a href="#c3">Next</a><br/>
```

```
</card>
<card id="c3" title="Card #3">

<big><b>Third Card</b></big><br/>
Have a good day<br/>
<a href="#c1"> Back to Card1</a><br/>
<a href="#c2"> Back to Card2</a><br/>

</card>
```

</wml>





Second Card be!come to WML Back Next



Third Card Have a good day Back to Card1 Back to Card2

# **Experiment No. 8**

Aim: - Write a Program to activate the current card in WML

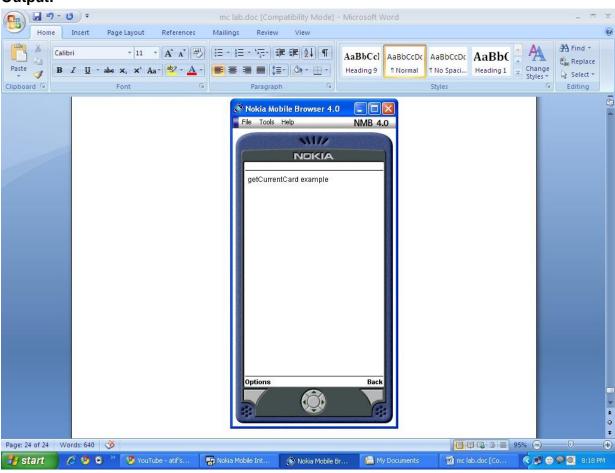
**Requirements:-** Nokia Mobile Internet toolkit

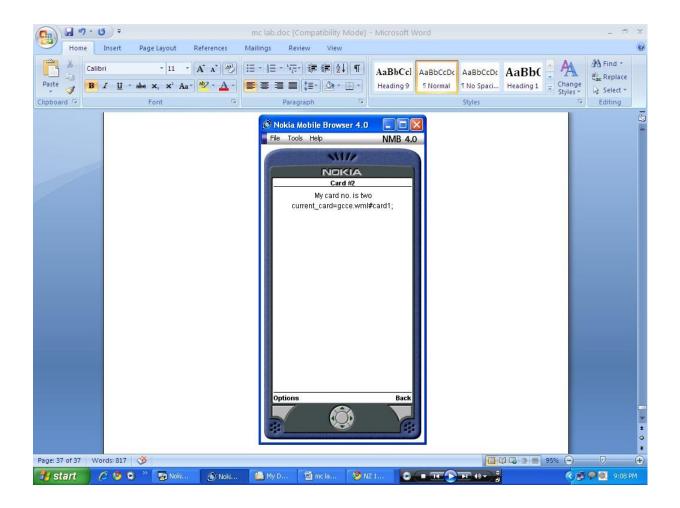
### **Code**

```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
<card id="card1" title="Card #1">
>
get current example
<do type="accept">
<go href="GetCurrentCardEg.wmls#find()"/>
</do>
</card>
<card id="card2" title="Card #2">
   My card no. is two
<br/>br/>
current_card=$(currentcard);
 </card>
</wml>
```

### Script File:

```
extern function find() {
  var curcard=WMLBrowser.getCurrentCard();
WMLBrowser.setVar("currentcard",curcard);
WMLBrowser.go("GCCE.wml#card2");
}
```





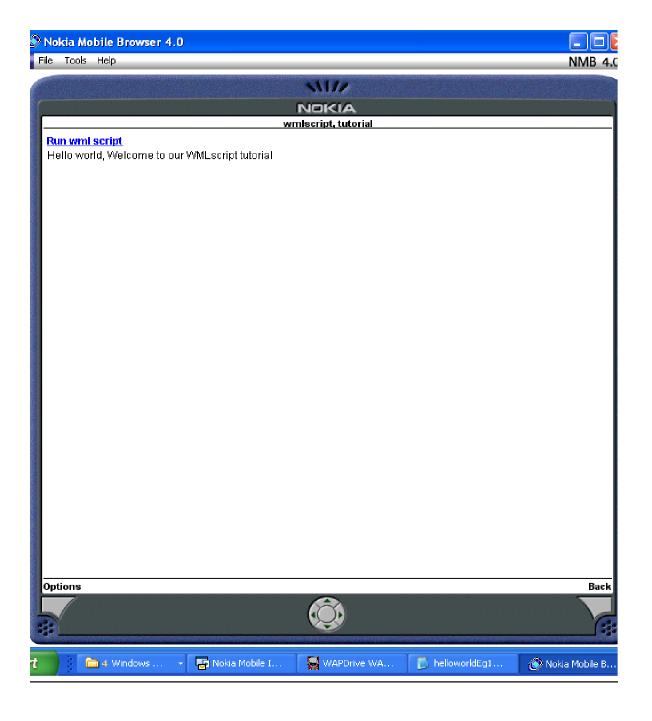
# **EXPERIMENT-9**

AIM: Write a program in wml to print a message using WML script.

#### **CODE:**

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
      <card id="card1" title="wmlscript, tutorial">
      >
             <a href="helloworldEg1.wmls#helloworld()">Run wml script</a>
             <br/>
             $(message)
      </card>
</wml>
WML Script:
extern function helloworld()
WMLBrowser.setVar("message","Hello world Welcome to my wml
tutorial"); WMLBrowser.refresh();
}
```

### **OUTPUT**:



## **EXPERIMENT-10**

AIM: Write a program in wml to generate a random number using WML script.

#### CODE:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
<card id="card1" title="WMLScript Random Number">
 >
generate random number via WML Script
  <a href="random_number.wmls#RandomNumber()">Generate Number</a><br/>br/>
         $(message)
       $(random)
$(message1)
 </card>
</wml>
WML Script:
extern function RandomNumber()
{
WMLBrowser.setVar("message", "Random Number
Generation"); WMLBrowser.setVar("random",
Lang.random(100)); WMLBrowser.setVar("message1",
"Random Number Generated"); WMLBrowser.refresh();
}
```

### **OUTPUT:**



# **Experiment -11**

Aim: - Write a Program to load a url by WML Script

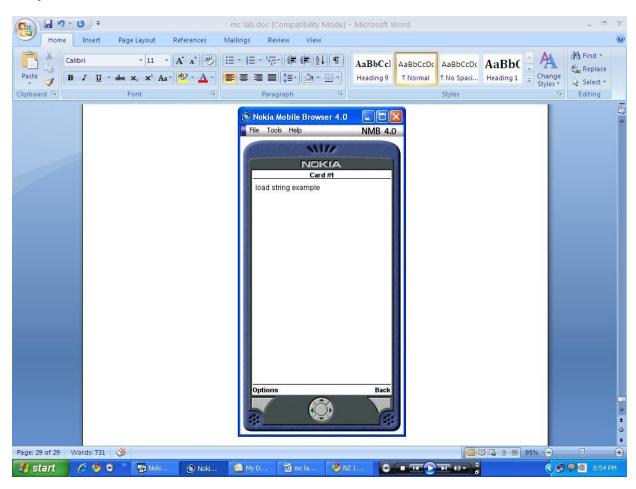
Requirements: - Nokia Mobile Internet toolkit

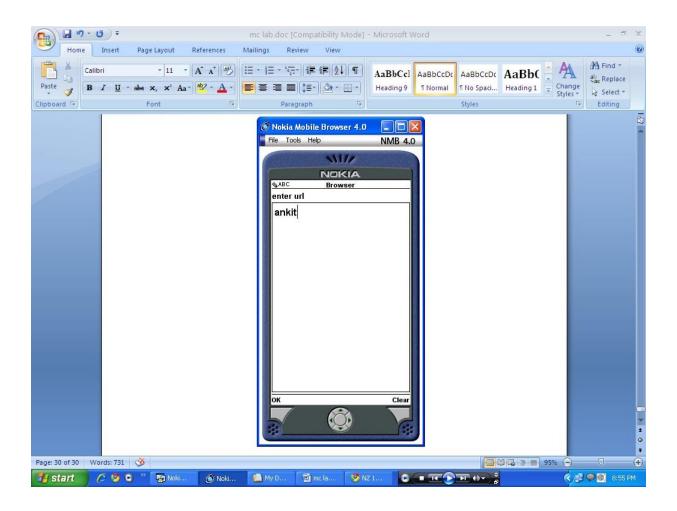
### **Code**

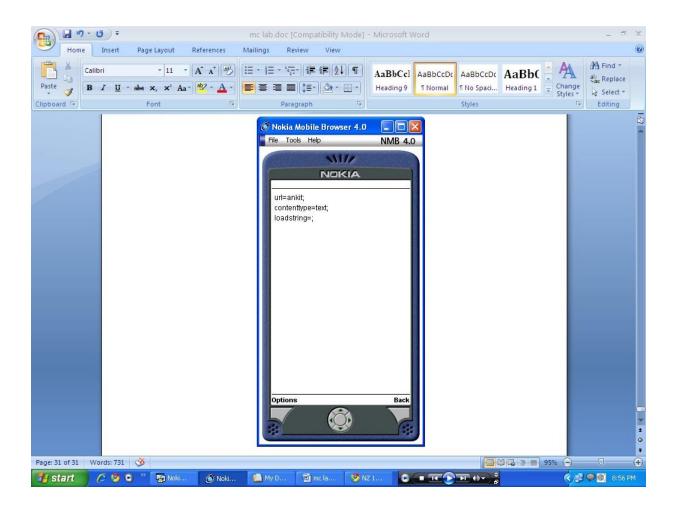
```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
 <card id="card1" title="Card #1">
 load string example
<do type ="accept">
<go href = "lsp.wmls#load()"/>
</do>
</card>
<card id="card2">
>
url=$(urlstring);
<br/>br/>
contenttype=$(content_type
);
```

```
<br/>br/>
loadstring=$(loadstr);
<br/>br/>
</card>
</wml>
Script File:
extern function load() {
var urlstr=Dialogs.prompt("enter url","");
var ctype=Dialogs.prompt("enter content
type","text"); var load=URL.loadString(urlstr,ctype);
WMLBrowser.setVar("urlstring",urlstr);
WMLBrowser.setVar("content_type",ctype);
WMLBrowser.setVar("loadstr",load);
WMLBrowser.go("laod.wml#card2");
```

}







# **Experiment No. 12**

Aim: - Write a Program to call a function by using WML Script to trim a screen.

**Requirements:-** Nokia Mobile Internet toolkit

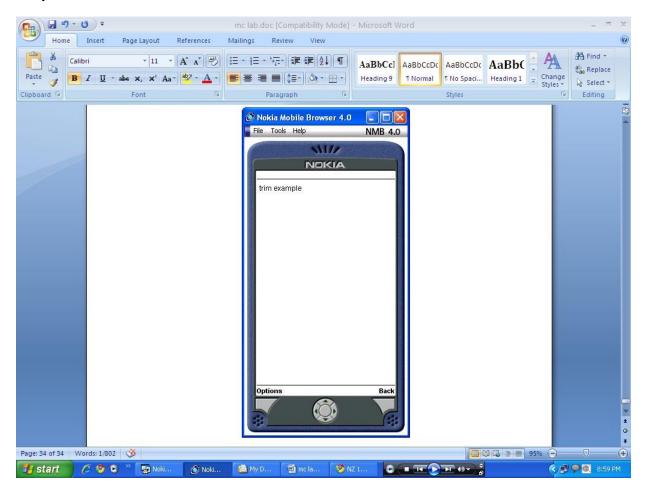
## **Code**

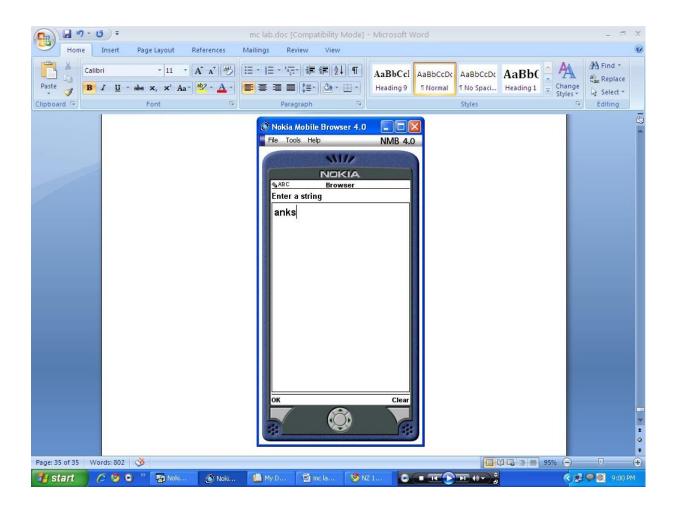
```
<?xml version="1.0" encoding="utf-8"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
  "http://www.wapforum.org/DTD/wml13.dtd">
<wml>
 <card id="c1">
>
trim example
<do type="accept">
<go href="TrimExample.wmls#findtrim()"/>
</do>
</card>
<card id="c2">
>
string=$(strn
g)
<br/>br/>
trim string=$(trimstrng)
</card>
</wml>
```

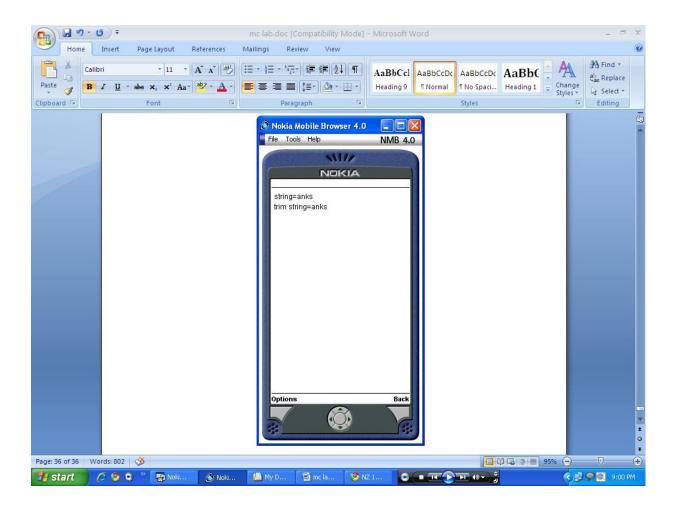
## Script File:

```
extern function findtrim() {
  var str= Dialogs.prompt("Enter a
  string",""); var trimstr=String.trim(str);
  WMLBrowser.setVar("strng",str);
  WMLBrowser.setVar("trimstrng",trimstr);
  WMLBrowser.go("trm.wml#c2");
}
```

#### **Output:**







AIM: Write a program in wml to apply validation on a form using WML script.

### CODE:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<wml>
<card id="card1" title="Registration Form">
  >
  <br/><br/>kegistration Form</br/>/big><br/>
  Notice: Fields with * are
      required.<br/>Form Validation
      Check via WML Script
  <b>$(errorMsg)</b><br/>>
  * User name:<br/>
  <input name="username"/><br/>>
  * Password (min. 8 characters):<br/>
  <input type="password" name="password"/><br/>
  * Email:<br/>
  <input
  name="email"/><br/>
  Name:<br/>
  <input name="name"/><br/>
```

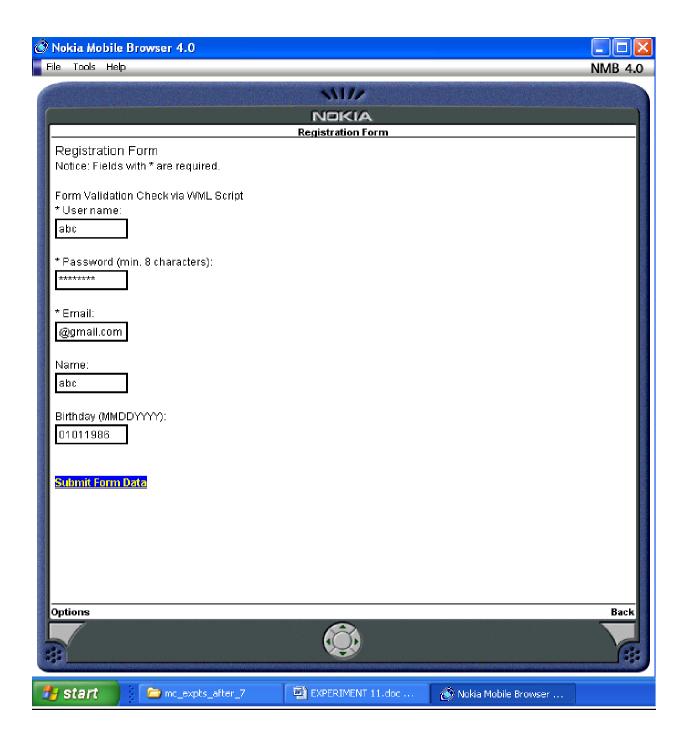
```
Birthday (MMDDYYYY):<br/>
   <input name="birthday" format="NNNNNNN" emptyok="true"/><br/>
  <a href="validate_form.wmls#validate()">Submit Form Data</a>
  </card>
</wml>
WML Script:
extern function validate()
{
var form_username =
String.trim(WMLBrowser.getVar("username")); var
form_password = String.trim(WMLBrowser.getVar("password"));
var form_email = String.trim(WMLBrowser.getVar("email"));
var form_name = String.trim(WMLBrowser.getVar("name"));
var form_birthday = String.trim(WMLBrowser.getVar("birthday"));
if (""==form username){
 WMLBrowser.setVar("errorMsg", "The User Name field must not be
 empty."); WMLBrowser.refresh();
 return;
}
if (""==form_password){
```

```
WMLBrowser.setVar("errorMsg", "The Password field must not be
empty."); WMLBrowser.refresh();
return;
}
if (""==form_email){
WMLBrowser.setVar("errorMsg", "The Email field must not be
empty."); WMLBrowser.refresh();
return;
}
if (String.length(form_password) < 8){
WMLBrowser.setVar("errorMsg", "The password must contain at least 8
characters since a short password is less secure.");
WMLBrowser.refresh()
; return;
}
if (!isEmailValid(form_email)){
 WMLBrowser.setVar("errorMsg", "The email address's format is
 invalid."); WMLBrowser.refresh();
 return;
}
if (""!=form_birthday && !isDateValid(form_birthday)){
```

```
WMLBrowser.setVar("errorMsg", "The date in the Birthday field is
  invalid."); WMLBrowser.refresh();
  return;
}
submit_form(form_username, form_password, form_email, form_name, form_birthday);
}
function isEmailValid(emailAddr)
{
if (String.elements(emailAddr, "@") !=
2) return false;
var element_1 = String.elementAt(emailAddr, 0,
 "@");
               var
                            element_2
 String.elementAt(emailAddr,
                                       "@");
                                 1,
(""==element_1 || ""==element_2)
return false;
return true;
}
function isDateValid(date)
{
var mm = String.subString(date, 0, 2);
var dd = String.subString(date, 2, 2);
var yyyy = String.subString(date, 4, 4);
```

```
mm =
Lang.parseInt(mm); dd =
Lang.parseInt(dd); yyyy
= Lang.parseInt(yyyy);
if (mm<1 || mm>12)
return false;
var maxDay = 31;
if (4==mm || 6==mm || 9==mm || 11==mm)
maxDay = 30;
if (2==mm){}
if (0 == yyyy\%4)
  maxDay = 29; // Leap
 year else
  maxDay = 28;
}
if (dd<1 || dd>maxDay)
return false;
return true;
}
function submit_form(form_username, form_password, form_email, form_name, form_birthday)
{
WMLBrowser.setVar("errorMsg", "");
```

```
WMLBrowser.setVar("username", form_username);
WMLBrowser.setVar("password", form_password);
WMLBrowser.setVar("email", form_email);
WMLBrowser.setVar("name", form_name);
WMLBrowser.setVar("birthday", form_birthday);
WMLBrowser.go("validateFormEg1_success.wml");
}
```





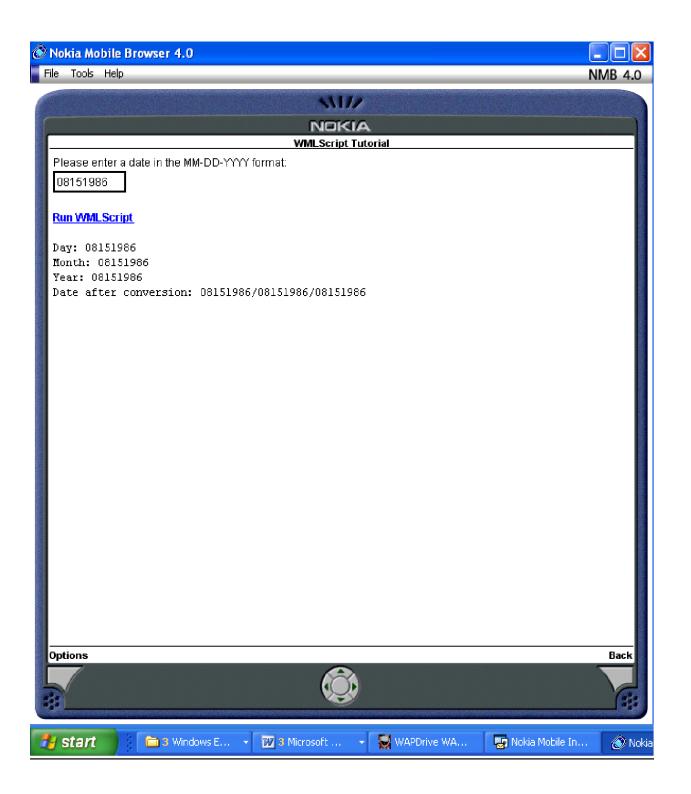
<u>AIM:</u> Write a program in wml to convert date format using WML script.

### **CODE:**

### **WML Script:**

```
extern function changeDateFormat(date)
{
WMLBrowser.setVar("datef2", date);
 parseDate("datef2", "day", "month", "year");
var datef2 =
WMLBrowser.getVar("datef2"); var day =
WMLBrowser.getVar("day");
var month =
WMLBrowser.getVar("month"); var year =
 WMLBrowser.getVar("year");
WMLBrowser.setVar("result", "Day: " + day + "\nMonth: " + month + "\nYear: " + year +
"\nDate after conversion: " + datef2);
WMLBrowser.refresh();
}
function parseDate(dateWMLVar, dayWMLVar, monthWMLVar, yearWMLVar)
{
var date =
WMLBrowser.getVar(dateWMLVar); var
 month = String.elementAt(date, 0, "-");
var day = String.elementAt(date, 1, "-
 "); var year = String.elementAt(date,
 2, "-"); date = day + "/" + month + "/"
 + year;
WMLBrowser.setVar(dateWMLVar, date);
 WMLBrowser.setVar(dayWMLVar, day);
```

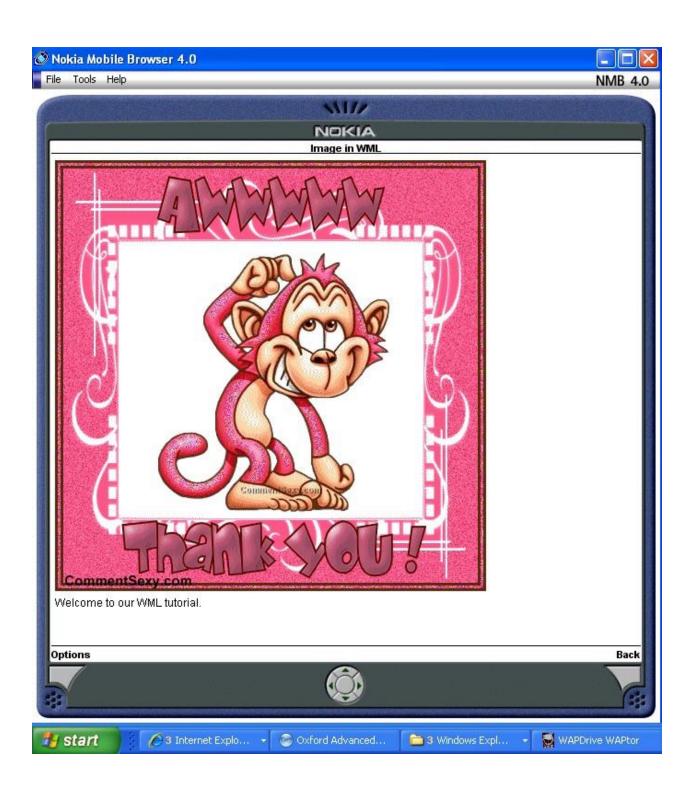
```
WMLBrowser.setVar(monthWMLVar, month);
WMLBrowser.setVar(yearWMLVar, year);
}
```



AIM: Write a program in wml to display an image.

### CODE:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
"http://www.wapforum.org/DTD/wml13.dtd">
<wml>
<card id="card1" title="Image in WML">
 >
  <img src="thankyou-monkey.gif" alt="Smile" height="62" width="60" /><br/>
  Welcome to our WML tutorial.
 </card>
</wml>
```



<u>AIM:</u> Write a program in wml to apply timer tag for 3 sec and display another page after 3sec.

#### CODE:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">

<wml>
<card ontimer="test.wml">
    <timer value="30"/>
    Hello World!
</card>
</wml>
```

#### test.wml

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN"
"http://www.wapforum.org/DTD/wml_1.1.xml">
<!-- created by EasyPad WAPtor (http://www.waptop.net/) -->
<wml>
```

```
<card id="MainCard" title="This is a first card">
welcome to Time zone
</card>
</wml>
```





AIM: Write a program to create a simple calculator using wml script in wml.

### CODE:

```
<?xml version="1.0"?>
<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.3//EN"
"http://www.wapforum.org/DTD/wml13.dtd">
<wml>
<card id="card1" title="calculator">
 >
  <br/><br/>dig>CALCULATOR</big><br/>
  Enter first number:<br/>
  <input name="first"/><br/>
  Enter second
  number:<br/>
  <input
   name="second"/><br/>
   result :<br/>
  <input name="result" value="$(result)" /><br/>
  <a href="calcu.wmls#add()">ADD</a><br/>
   <a href="calcu.wmls#sub()">SUBTRACTION</a><br/>
  <a href="calcu.wmls#multi()">MULTIPLY</a><br/>
```

```
<a href="calcu.wmls#divi()">DIVISION</a><br/>
```

```
</card>
</wml>
```

### WML Script:

```
extern function add()
var first= WMLBrowser.getVar("first");
var second= WMLBrowser.getVar("second");
first= Lang.parseInt(first);
second = Lang.parseInt(second);
WMLBrowser.setVar("result", first + second);
WMLBrowser.refresh();
}
extern function sub()
{var first= WMLBrowser.getVar("first");
var second= WMLBrowser.getVar("second");
first= Lang.parseInt(first);
second = Lang.parseInt(second);
WMLBrowser.setVar("result", first -
second); WMLBrowser.refresh();
```

```
}
extern function multi()
{
var first= WMLBrowser.getVar("first");
var second= WMLBrowser.getVar("second");
first= Lang.parseInt(first);
second = Lang.parseInt(second);
WMLBrowser.setVar("result", first * second);
WMLBrowser.refresh();
}
extern function divi()
{
var first= WMLBrowser.getVar("first");
var second= WMLBrowser.getVar("second");
first= Lang.parseInt(first);
second = Lang.parseInt(second);
WMLBrowser.setVar("result", first / second);
WMLBrowser.refresh();
}
```

