FACULTY OF ENGINEERING AND TECHNOLOGY DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

LINUX LABORATORY

ENCS313

SHELL PROJECT

Instructor : Dr. Mohammad Jubran

Prepared by:

Aya Dahbour - 1201738

Jalila Muadi - 1201611

Section : 5

Date : 1/1/2023

Abstract:

In this project, we had to write code that reads data from any file and encode and scale features . This data is a collection of attributes arranged as columns. The semicolon ";" separates them. The first row of data is the heading that displays the feature names. They can be of two types Numeric attributes of integer type and categorical attributes.

Explanation and details:

First, the project displays a menu for the user to choose what they want to do with the dataset as follows :

```
# Main menu
mneu(){
    echo "|---------------------- MENU ----------------------"
    echo "| r) Read a Dataset From a File.                   "
    echo "| p) Print The Name Of The Feature.                "
    echo "| l) Encode a Feature using Label Encoding.        "
    echo "| o) Encode a Feature Using one-hot Encoding.      "
    echo "| m) Applay MinMax Scalling.                       "
    echo "| s) Save The Processed Dataset.                   "
    echo "| e) Exit...                                       "
    echo '| Please Enter Any Option From The Above Menu:     ';   read option
    echo '---------------------------------------------------'
    userInput="$option"
    currentFeatures="-"
}
```

```
while true; do
    mneu
    if test -f "tempSelected"; then
        fileSelectedFlag="1"
        filename="$(cat tempSelected)"
        currentFeatures="$(cat tempFeatures)"
        currentLines="$(cat tempLines)"
        index=0
        valuesArr=()
        currentValue=""
        encodedArr=('')
        IFS=';' read -r -a featuresArray <<<$currentFeatures
    fi
    case $option in
        r) read_data ;;
        p) print_feature ;;
        l) lableEncode ;;
        o) oneHotEncoded;;
        m) scaled;;
        s) saveData ;;
        e) Exit ;;
        *) echo "Invalid Choise!! Try Again "
    esac
done
```

```
~/jalilaAndAya$ ./project.sh
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
| o) Encode a Feature Using one-hot Encoding.
| m) Applay MinMax Scalling.
| s) Save The Processed Dataset.
| e) Exit...
| Please Enter Any Option From The Above Menu:
k
-------------------------------------------------
Invalid Choise!! Try Again
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
```

If the user enters 'r':

a. The program should print on the screen "Please input the name of the dataset file".

b. The program should verify that the file exists, otherwise a message should be printed on the screen "file does not exist" and then return to the main menu. Then check the format of the data in the dataset. In case of any format problems, the program should print on the screen "The format of the data in the dataset file is wrong" and then return to the main menu.

```
#!/bin/bash
                            #  Jalila Muadi & Aya Dahbour  #

read_data(){

      #remove previously created temps
     if test -f "tempSelected"; then
         rm tempSelected
         rm tempFeatures
         rm tempLines
     fi
     fileSelectedFlag="1"
     echo "Please input the name of the dataset file "
     #verify that the file exists
     read filename
     if test -f "$filename"; then
         #file exists
         echo -e $filename >> "tempSelected"
         echo "$filename"" has been Selected"
         #test the format
         rawData=$(cat "$filename")
         #rawData=$testdata
         delimiter=";"
         if [[ $rawData  == *"$delimiter"*  ]]; then
             #file has the dilimiter
             features_flag="0"
```

```
        #file has the dilimiter
        features_flag="0"

        while IFS=";" read -r line
            do
                if [[ $features_flag == "0" ]]; then
                    #read features line
                    echo "features line = ""$line"
                    currentFeatures="$line"
                    echo -e $line >> "tempFeatures"
                    features_flag="1"
                    fileSelectedFlag="1"
                else
                    #read lines
                    echo "line = " "$line"
                    echo -e $line >>"tempLines"
                fi
            done < $filename
            fileSelectedFlag=1
    else
        echo "The format of the data in the dataset file is wrong"
        return
    fi
else
    else
        #file does not exist
        echo "file does not exist"
        fileSelectedFlag=0
        return
    fi
}
```

```
| e) Exit...
| Please Enter Any Option From The Above Menu:
r
-------------------------------------------------
Please input the name of the dataset file
correctFile
file does not exist
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
```

d. If the person selects any option other than ‘r’ or ‘e’ before the format of the data in the dataset file is verified correctly, the program should print on the screen “You must first read a dataset from a file” and then return to the main menu.

```
p
--------------------------------------------------
you must first read a dataset from a file
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
| o) Encode a Feature Using one-hot Encoding.
| m) Applay MinMax Scalling.
| s) Save The Processed Dataset.
| e) Exit...
| Please Enter Any Option From The Above Menu:
o
--------------------------------------------------
you must first read a dataset from a file
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
```

But if the user enter r first :

```
| e) Exit...
| Please Enter Any Option From The Above Menu:
r
--------------------------------------------------
Please input the name of the dataset file
data
data has been Selected
features line = id;age;gender;height;weight;active;smoke;governorate;
line =  1;30;male;170;88;no;yes;ramallah;
line =  2;25;female;160;65;no;no;ramallah;
line =  3;28;male;165;72;yes;yes;nablus;
line =  4;44;male;188;90;no;no;jerusalem;
line =  5;60;female;166;70;no;no;jerusalem;
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
```

If the user enters ‘p’:

the program should print on the screen the names of all features of the dataset file and then return to the main menu.

```
print_feature(){
    if [ "$fileSelectedFlag" = "1" ]; then
    #cat tempSelected
        echo "List of available features: ""$currentFeatures"
    else
        echo "you must first read a dataset from a file"
        return
    fi
}
```

```
| e) Exit...
| Please Enter Any Option From The Above Menu:
p
-------------------------------------------------
List of available features: id;age;gender;height;weight;active;smoke;governorate;
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
```

If the user enters ‘l’:

```
lableEncode(){
if [ "$fileSelectedFlag" = "1" ]; then
    echo "List of available features : ""$currentFeatures"
    echo "Please input the name of the categorical feature for label encoding :
"; read lFeature
    echo " "
    if [[  $currentFeatures == *"$lFeature"";"*  ]] ; then
        echo "selected feature = " "$lFeature"

        index=-1
        for i in "${!featuresArray[@]}"; do
            if [[ "${featuresArray[$i]}" == *"$lFeature" ]]; then
                index=$i
                break
            fi
        done

        if [ $index -gt -1 ]; then
            echo "Index of the Selected Feature : $index"

            #label encoding
            #going 2D
            #empty lists
            newColumn=""
            dictArray=('')
```

```
#empty lists
newColumn=""
dictArray=('')
dIndex="-1"
#cat tempLines

while IFS="" read -r p || [ -n "$p" ]
do
    #printf '%s\n' "$p"
    #split the line to an array by the delimiter
    IFS=';' read -r -a linesArray <<<$p
    # requested feature : its value
    currentValue="${linesArray[$index]}"
    # echo "$lFeature : ""$currentValue"
    #valuesArr+=("${linesArray[$index]}")
    valuesArr+=("$currentValue")
    # echo "all ""${valuesArr[@]}"
done < tempLines

#remove duplicates and add the dictionary array
while IFS= read -r -d '' x
do
    dictArray+=("$x")
done < <(printf "%s\0" "${valuesArr[@]}" | sort -uz)

echo "dictionary of column $index {""${dictArray[@]}}"
```

alilaAndAya/project.sh

```
echo "dictionary of column $index {""${dictArray[@]}}"

for ii in "${!valuesArr[@]}"
do
    echo " index---------------content"
    echo " $ii                  ${valuesArr[$ii]}"
    dictIndex=-1
    for iii in "${!dictArray[@]}";
    do
        if [[ "${dictArray[$iii]}" = "${valuesArr[$ii]}" ]]; then
            dictIndex=$iii
            break
        fi
    done

    if [ $dictIndex -gt -1 ]; then
        echo "Index of value in Dictionary is : $dictIndex"
        dictId=$dictIndex
        encodedArr+=("$dictId")

    else
        echo "Element is not in Dictionary."
    fi
    echo "label encoded column = ""${encodedArr[@]}"
done
```

```
                    fi
                    echo "label encoded column = ""${encodedArr[@]}"
                done
                else
                    echo "Element is not in Array."
                    #return to main menu
                    return

                fi
        else
            echo "The name of categorical feature is wrong"
            return
        fi
    else
      echo "you must first read a dataset from a file"
      return
    fi
    flagSaved=0
    }
```

a. The program should ask for the name of the feature to be encoded using label encoding by printing on the screen “Please input the name of the categorical feature for label encoding”
b. The program should verify that the entered name of the categorical feature exists in the dataset, otherwise prints on screen “The name of categorical feature is wrong” and then return to the main menu.

```
| Please Enter Any Option From The Above Menu:
1
------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the categorical feature for label encoding :
ids

The name of categorical feature is wrong
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

c. If the entered name of the categorical feature exists, the program should print on the screen the distinct values of the categorical feature and the code of each value. And also, to encode the categorical feature in the dataset using label encoding as described above and then return to the main menu.

```
selected feature =  active
Index of the Selected Feature : 5
dictionary of column 5 { no yes}
 index---------------content
 0                   no
Index of value in Dictionary is : 1
label encoded column =  1
 index---------------content
 1                   no
Index of value in Dictionary is : 1
label encoded column =  1 1
 index---------------content
 2                   yes
Index of value in Dictionary is : 2
label encoded column =  1 1 2
 index---------------content
 3                   no
Index of value in Dictionary is : 1
label encoded column =  1 1 2 1
 index---------------content
 4                   no
Index of value in Dictionary is : 1
label encoded column =  1 1 2 1 1
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| n) Print The Name Of The Feature
```

```
selected feature =  gender
Index of the Selected Feature : 2
dictionary of column 2 { female male}
 index---------------content
 0                   male
Index of value in Dictionary is : 2
label encoded column =  2
 index---------------content
 1                   female
Index of value in Dictionary is : 1
label encoded column =  2 1
 index---------------content
 2                   male
Index of value in Dictionary is : 2
label encoded column =  2 1 2
 index---------------content
 3                   male
Index of value in Dictionary is : 2
label encoded column =  2 1 2 2
 index---------------content
 4                   female
Index of value in Dictionary is : 1
label encoded column =  2 1 2 2 1
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

```
| Please Enter Any Option From The Above Menu:
1
-------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the categorical feature for label encoding :
governorate

selected feature =  governorate
Index of the Selected Feature : 7
dictionary of column 7 { jenen jerusalem nablus ramallah}
 index---------------content
 0                 ramallah
Index of value in Dictionary is : 4
label encoded column =  4
 index---------------content
 1                 jenen
Index of value in Dictionary is : 1
label encoded column =  4 1
 index---------------content
 2                 nablus
Index of value in Dictionary is : 3
label encoded column =  4 1 3
```

```
 index---------------content
 2                   nablus
Index of value in Dictionary is : 3
label encoded column =  4 1 3
 index---------------content
 3                   jerusalem
Index of value in Dictionary is : 2
label encoded column =  4 1 3 2
 index---------------content
 4                   jerusalem
Index of value in Dictionary is : 2
label encoded column =  4 1 3 2 2
|----------------------- MENU -----------------------
| r) Read a Dataset From a File.
| n) Print The Name Of The Feature
```

```
selected feature =  smoke
Index of the Selected Feature : 6
dictionary of column 6 { no yes}
 index---------------content
 0                 yes
Index of value in Dictionary is : 2
label encoded column =  2
 index---------------content
 1                 no
Index of value in Dictionary is : 1
label encoded column =  2 1
 index---------------content
 2                 yes
Index of value in Dictionary is : 2
label encoded column =  2 1 2
 index---------------content
 3                 no
Index of value in Dictionary is : 1
label encoded column =  2 1 2 1
 index---------------content
 4                 no
Index of value in Dictionary is : 1
label encoded column =  2 1 2 1 1
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

If the user enters ‘o’:

```
oneHotEncoded(){
  if [ "$fileSelectedFlag" = "1" ]; then
      echo "List of available features : ""$currentFeatures"
      echo "Please input the name of the categorical feature for one-hot encoding : "; read lFeature
      echo " "
      if [[  $currentFeatures == *"$lFeature"";"*  ]] ; then
          echo "selected feature = " "$lFeature"
          index=-1
          for i in "${!featuresArray[@]}"; do
              if [[ "${featuresArray[$i]}" == *"$lFeature" ]]; then
                  index=$i
                  break
              fi
          done
          if [ $index -gt -1 ]; then
              echo "Index of the Selected Feature : $index"
          else
              echo "Element is not in Array."
              #return to main menu
              return
           fi
      else
```

```
          if [ $index -gt -1 ]; then
              echo "Index of the Selected Feature : $index"
          else
              echo "Element is not in Array."
              #return to main menu
              return
           fi
      else
          echo "The name of categorical feature is wrong"
          return
      fi
  else
    echo "you must first read a dataset from a file"
    return
  fi
  flagSaved=0
  }
```

a. The program should ask for the name of the feature to be encoded using one-hot encoding by printing on the screen “Please input the name of the categorical feature for one-hot encoding”.

b. The program should verify that the entered name of the categorical feature exists in the dataset, otherwise the program should print on screen “The name of the categorical feature is wrong” and then return to the main menu.

```
| Please Enter Any Option From The Above Menu:
o
-----------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the categorical feature for one-hot encoding :
genders

The name of categorical feature is wrong
```

c. If the entered name of the categorical feature exists, the program should then print on the screen the distinct values of the categorical feature. And also, to encode the categorical feature in the dataset using one-hot encoding as described above and then return to the main menu.

```
| Please Enter Any Option From The Above Menu:
o
-------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the categorical feature for one-hot encoding :
height

selected feature =  height
Index of the Selected Feature : 3
|---------------------- MENU ----------------------
```

```
| Please Enter Any Option From The Above Menu:
o
-------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the categorical feature for one-hot encoding :
smoke

selected feature =  smoke
Index of the Selected Feature : 6
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

If the user enters ‘m’:

```
scaled(){
    if [ "$fileSelectedFlag" = "1" ]; then
     echo "List of available features : ""$currentFeatures"
     echo "Please input the name of the feature to be scaled : "; read lFeature
     echo " "
     if [[  $currentFeatures == *"$lFeature";*  ]] ; then
         echo "selected feature = " "$lFeature"

         index=-1
         for i in "${!featuresArray[@]}"; do
             if [[ "${featuresArray[$i]}" == *"$lFeature" ]]; then
                 index=$i
                 break
             fi
         done

         if [ $index -gt -1 ]; then
             echo "Index of the Selected Feature : $index"

          else
              echo "Element is not in Array."
```

```
04
05          else
06              echo "Element is not in Array."
07              #return to main menu
08              return
09          fi
10      else
11          echo "The name of categorical feature is wrong"
12          return
13      fi
14  else
15    echo "you must first read a dataset from a file"
16    return
17  fi
18  flagSaved=0
19  }
20
```

a. The program should ask for the name of the feature to be scaled using MinMax scaling by printing on the screen “Please input the name of the feature to be scaled”.

```
| Please Enter Any Option From The Above Menu:
m
-------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the feature to be scaled :
weights

The name of categorical feature is wrong
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

b. If the entered feature is a categorical feature, the program should verify that this feature is encoded, otherwise, the program should print on screen “this feature is categorical feature and must be encoded first” and then return to the main menu.

c. If the feature is numeric or encoded categorical feature, the program should print on the screen the minimum and maximum values of the feature and apply the MinMax scaling to the feature vector and then return to main menu.

```
| Please Enter Any Option From The Above Menu:
m
-------------------------------------------------
List of available features : id;age;gender;height;weight;active;smoke;governorate;
Please input the name of the feature to be scaled :
active

selected feature =  active
Index of the Selected Feature : 5
|---------------------- MENU ----------------------
```

If the user enters ‘s’:

```
saveData(){

  if [ "$fileSelectedFlag" = "1" ]; then
      flagSaved=1
      echo "Please input the name of the file to save the processed dataset: "; read
  sFileName
      echo "The $sFileName is saved.."
  else
        echo "you must first read a dataset from a file"
        return
  fi

}
```

a. The program should print on the screen “Please input the name of the file to save the processed dataset”.
b. The program should save the processed dataset into the entered filename and then return to the main menu.

```
| e) Exit...
| Please Enter Any Option From The Above Menu:
s
-------------------------------------------------
Please input the name of the file to save the processed dataset:
processedData.txt
The processedData.txt is saved..
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

If the user enters 'e':

```
Exit(){
 if [ "$flagSaved" = "1" ]; then
      echo "Are you sure you want to exit (yes/no)"; read op
      if [ "$op" == "yes" ]; then
            #clean
            rm tempSelected
            rm tempFeatures
            rm tempLines
            exit
      else
          return
      fi
 elif  [ "$flagSaved" = "0" ]; then
     echo "The processed dataset is not saved. Are you sure you want to exit (yes/no)";
 read op1
     if [ "$op1" == "yes" ]; then
            #clean
            rm tempSelected
            rm tempFeatures
            rm tempLines
            exit
      else
          return
      fi
```

```
          return
      fi
 else
     echo "Are you sure you want to exit (yes/no)"; read op2
      if [ "$op2" == "yes" ]; then
          exit
      else
          return
      fi
 fi
 }
```

a. The program should check if the processed dataset is saved using option "s". if not, the program should print on the screen "The processed dataset is not saved. Are you sure you want to exist". If the person inputs "yes", the program ends. Otherwise, the program should return to main menu.

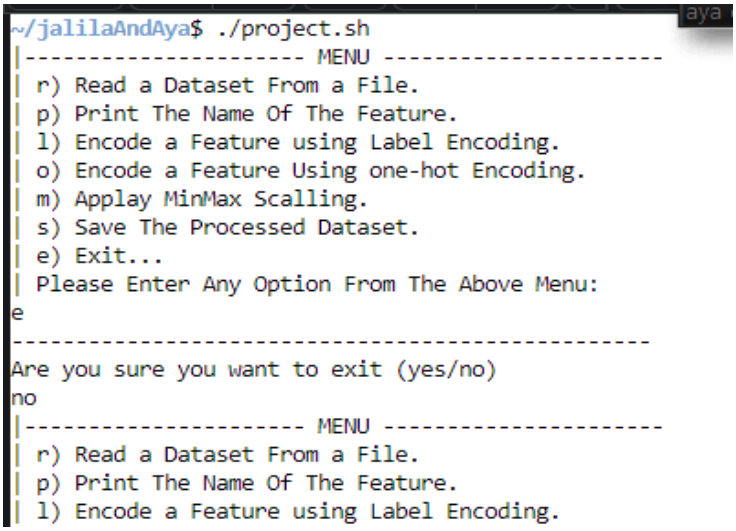
```
| e) Exit...
| Please Enter Any Option From The Above Menu:
e
-------------------------------------------------
The processed dataset is not saved. Are you sure you want to exit (yes/no)
no
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
| o) Encode a Feature Using one-hot Encoding.
| m) Applay MinMax Scalling.
| s) Save The Processed Dataset.
| e) Exit...
| Please Enter Any Option From The Above Menu:
e
-------------------------------------------------
The processed dataset is not saved. Are you sure you want to exit (yes/no)
yes
~/jalilaAndAya$
```

b. However, if the dataset is saved, the program should print on the screen “Are you sure you want to exist”. If the person inputs “yes”, the program ends. Otherwise, the program should return to the main menu.

```
| Please Enter Any Option From The Above Menu:
e
-------------------------------------------------
Are you sure you want to exit (yes/no)
no
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

```
| e) Exit...
| Please Enter Any Option From The Above Menu:
e
-------------------------------------------------
Are you sure you want to exit (yes/no)
yes
~/jalilaAndAya$
```

- If the user enter ‘e’ in the first :


aya
~/jalilaAndAya$ ./project.sh
|---------- MENU ----------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.
| o) Encode a Feature Using one-hot Encoding.
| m) Applay MinMax Scalling.
| s) Save The Processed Dataset.
| e) Exit...
| Please Enter Any Option From The Above Menu:
e
Are you sure you want to exit (yes/no)
no
|---------- MENU ----------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
| l) Encode a Feature using Label Encoding.

Another Dataset :

```
| Please Enter Any Option From The Above Menu:
r
-------------------------------------------------
Please input the name of the dataset file
anotherData
anotherData has been Selected
features line = age;sex;bmi;children; smoker;region; charges;
line =  19;female;27;0; yes; southwest ;16884;
line =  18;male;33; 1; no; southeast; 1725;
line =  28;male;33;3; no; southeast; 4449;
line =  33;male;22;0; no; northwest; 21984;
line =  32;male;28;0; no; northwest; 3866;
line =  31;female;25;0; no; southeast; 3756;
line =  46;female;33;1; yes; southeast; 8240;
|---------------------- MENU ----------------------
```

```
| Please Enter Any Option From The Above Menu:
p
-------------------------------------------------
List of available features: age;sex;bmi;children; smoker;region; charges;
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
```

```
| Please Enter Any Option From The Above Menu:
l
-------------------------------------------------
List of available features : age;sex;bmi;children; smoker;region; charges;
Please input the name of the categorical feature for label encoding :
sex

selected feature =  sex
Index of the Selected Feature : 1
dictionary of column 1 { female male}
 index--------------content
 0                  female
Index of value in Dictionary is : 1
label encoded column =  1
 index--------------content
 1                  male
Index of value in Dictionary is : 2
label encoded column =  1 2
 index--------------content
 2                  male
Index of value in Dictionary is : 2
label encoded column =  1 2 2
```

```
 index---------------content
 2                   male
Index of value in Dictionary is : 2
label encoded column =  1 2 2
 index---------------content
 3                   male
Index of value in Dictionary is : 2
label encoded column =  1 2 2 2
 index---------------content
 4                   male
Index of value in Dictionary is : 2
label encoded column =  1 2 2 2 2
 index---------------content
 5                   female
Index of value in Dictionary is : 1
label encoded column =  1 2 2 2 2 1
 index---------------content
 6                   female
Index of value in Dictionary is : 1
label encoded column =  1 2 2 2 2 1 1
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
| p) Print The Name Of The Feature.
```

```
List of available features : age;sex;bmi;children; smoker;region; charges;
Please input the name of the categorical feature for label encoding :
region

selected feature =  region
Index of the Selected Feature : 5
dictionary of column 5 {  northwest  southeast  southwest }
 index---------------content
 0                   southwest
Index of value in Dictionary is : 3
label encoded column =  3
 index---------------content
 1                   southeast
Index of value in Dictionary is : 2
label encoded column =  3 2
 index---------------content
 2                   southeast
Index of value in Dictionary is : 2
label encoded column =  3 2 2
 index---------------content
 3                   northwest
Index of value in Dictionary is : 1
label encoded column =  3 2 2 1
 index---------------content
 4                   northwest
Index of value in Dictionary is : 1
label encoded column =  3 2 2 1 1
```

```
 index---------------content
 4                   northwest
Index of value in Dictionary is : 1
label encoded column =  3 2 2 1 1
 index---------------content
 5                   southeast
Index of value in Dictionary is : 2
label encoded column =  3 2 2 1 1 2
 index---------------content
 6                   southeast
Index of value in Dictionary is : 2
label encoded column =  3 2 2 1 1 2 2
|---------------------- MENU ----------------------
| r) Read a Dataset From a File.
```

```
------------------------------------------------
List of available features : age;sex;bmi;children; smoker;region; charges;
Please input the name of the categorical feature for label encoding :
smoker

selected feature =  smoker
Index of the Selected Feature : 4
dictionary of column 4 {  no  yes}
 index---------------content
 0                   yes
Index of value in Dictionary is : 2
label encoded column =  2
 index---------------content
 1                   no
Index of value in Dictionary is : 1
label encoded column =  2 1
 index---------------content
 2                   no
Index of value in Dictionary is : 1
label encoded column =  2 1 1
 index---------------content
 3                   no
Index of value in Dictionary is : 1
label encoded column =  2 1 1 1
 index---------------content
 4                   no
Index of value in Dictionary is : 1
```

```
 index---------------content
 4                   no
Index of value in Dictionary is : 1
label encoded column =  2 1 1 1 1
 index---------------content
 5                   no
Index of value in Dictionary is : 1
label encoded column =  2 1 1 1 1 1
 index---------------content
 6                   yes
Index of value in Dictionary is : 2
label encoded column =  2 1 1 1 1 1 2
|---------------------- MENU ----------------------
```