**Republic of the Philippines**

BOHOL ISLAND STATE UNIVERSITY

MAIN CAMPUS

**COLLEGE OF ENGINEERING AND ARCHITECTURE**

*Vision:* ***A premiere S&T university for the formation of world class and virtuous human resource for sustainable development in Bohol and the Country.***

*Mission:* ***BISU is committed to provide quality higher education in the arts and sciences, as well as in the professional and technological fields: undertake research and development, and extension services for the sustainable development of Bohol and the country.***

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MIDTERM

VALID STATEMENT:

**DFA**

Q4

Q0

**;**

**EXPR**

**=**

**IDEN**

Q3

Q2

Q1

**IDEN**

**EXPR**

**=**

**OTHERS**

**;**

**=**

**OTHERS**

**EXPR**

**;**

**=**

**OTHERS**

**IDEN**

**EXPR**

**IDEN**

**;**

**=**

**OTHERS**

**EXPR**

**IDEN**

**OTHERS**

Q5

**IDEN, =, EXPR, ;**

STATE TABLE:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **State** | **iden** | **=** | **expr** | **;** | **others** |
| **0** | **1** | **5** | **5** | **5** | **5** |
| **1** | **5** | **2** | **5** | **4** | **5** |
| **2** | **1** | **5** | **3** | **5** | **5** |
| **3** | **5** | **5** | **5** | **4** | **5** |
| **4** | **5** | **5** | **5** | **5** | **5** |
| **5** | **5** | **5** | **5** | **5** | **5** |

VALID EXPRESSION:

**DFA**

**SIMPLENO, IDEN**

**OPERATOR**

**SIMPLENO, IDEN**

Q3

Q2

Q1

Q0

**OPERATOR**

**OTHERS**

**IDEN**

**SIMPLENO**

**OTHERS**

**IDEN**

**SIMPLENO**

**OTHERS**

**OPERATOR**

**OTHERS**

Q4

**IDEN, OPERATOR, SIMPLENO, OTHERS**

STATE TABLE:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **iden** | **operator** | **simpleno** | **others** |
| **0** | **1** | **4** | **1** | **4** |
| **1** | **4** | **2** | **4** | **4** |
| **2** | **3** | **4** | **3** | **4** |
| **3** | **4** | **2** | **4** | **4** |
| **4** | **4** | **4** | **4** | **4** |

VALID SIMPLENO:

**DFA**

**.**

**DIGIT**

**DIGIT**

Q3

Q2

Q1

Q0

**.**

**OTHERS**

**.**

**OTHERS**

**.**

**OTHERS**

**OTHERS**

Q4

**., DIGIT, OTHERS**

|  |  |  |  |
| --- | --- | --- | --- |
| **State** | **digit** | **.** | **others** |
| **0** | **1** | **4** | **4** |
| **1** | **1** | **2** | **4** |
| **2** | **3** | **4** | **4** |
| **3** | **3** | **4** | **4** |
| **4** | **4** | **4** | **4** |

STATE TABLE:

VALID IDENTIFIER:

**DFA**

**-, ALPHA, DIGIT**

Q1

**-, ALPHA**

Q0

**DIGIT**

**OTHERS**

**OTHERS**

Q4

STATE TABLE:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **State** | **-** | **alpha** | **digit** | **others** |
| **0** | **1** | **1** | **2** | **2** |
| **1** | **1** | **1** | **1** | **2** |
| **2** | **2** | **2** | **2** | **2** |

**CODE:**

using System;

using System.Collections.Generic;

using System.Linq;

using System.Text;

using System.Threading.Tasks;

namespace midterm

{

class Program

{

char[] save1;

string[] save2;

string[] save3;

public int splitting(string state\_ment)

{

//converting string to char array

char[] str = state\_ment.ToCharArray();

//to save the delimiter, make a copy

char[] strdup = state\_ment.ToCharArray();

save1 = state\_ment.ToCharArray();

string[] split = state\_ment.Split(new char[] { '=', ';' }, StringSplitOptions.RemoveEmptyEntries);

var str1 = new List<string>();

int from = 0;

int testme = 0;

//hello=num;

//5

//

// Console.WriteLine("adding on the list");

foreach (string ch in split)

{

// Console.WriteLine("string {0}",ch);

str1.Add(ch);

// Console.WriteLine("inserting {0}",ch);

from = ch.Length + from;

// Console.WriteLine(from);

str1.Add(str[from + testme].ToString());

testme++;

}

//testing the List

//saving it to public variable

// Console.WriteLine("Transferring");

int cap = str1.Count;

save2 = new String[cap];

int count = 0;

foreach (string gh in str1)

{

// Console.WriteLine(gh);

save2[count] = gh.ToString();

// Console.WriteLine(save2[count]);

count++;

}

return 1;

}

int check\_simpleno(string simplenum)

{

int state = 0;

int[,] table = new int[,] {

{1,4,4},

{1,2,4},

{3,4,4},

{3,4,4},

{4,4,4}

};

int input = 0;

int flag = 0;

//test simple number function

//checking each char if its digits

foreach (char n in simplenum)

{

// Console.WriteLine(n);

if (n == '.')

{

input = 1;

// Console.WriteLine("state\_1");

}

else if (char.IsDigit(n))

{

input = 0;

// Console.WriteLine("state\_0");

}

else

{

input = 2;

// Console.WriteLine("state\_2");

}

state = table[state, input];

if (state == 1)

{

flag = 1;

}

else if (state == 3)

{

flag = 1;

}

else

{

flag = 0;

}

}

if (flag == 1)

{

// Console.WriteLine("simplenumber\_accepted");

return 1;

}

else

{

// Console.WriteLine("simplenumber\_notaccepted");

return 0;

}

}

int check\_identifier(string simpleidentifier)

{

int state = 0;

int[,] table = new int[,] {

{1,1,2,2},

{1,1,1,2},

{2,2,2,2}

};

int input;

int flag = 0;

// Console.WriteLine("identifier function");

foreach (char m in simpleidentifier)

{

if (m == '\_')

{

input = 0;

// Console.WriteLine("identifier detects \_ ");

}

else if (char.IsLetter(m))

{

input = 1;

// Console.WriteLine("identifier detects letter");

}

else if (char.IsDigit(m))

{

input = 2;

// Console.WriteLine("identifier detects digit");

}

else

{

input = 3;

// Console.WriteLine("?");

}

state = table[state, input];

if (state == 1)

{

flag = 1;

}

else

{

flag = 0;

}

}

// Console.WriteLine("identifing");

if (flag == 1)

{

// Console.WriteLine("identifier");

return 1;

}

else

{

// Console.WriteLine("Not identifier");

return 0;

}

}

int check\_expression(string expressme)

{

// Console.WriteLine("New string {0}",expressme);

int state = 0;

int input;

int[,] table = new int[,] {

{1,4,1,4},

{4,2,4,4},

{3,4,3,4},

{4,2,4,4},

{4,4,4,4}

};

char a = '+';

char b = '-';

char c = '\*';

char d = '/';

char e = '%';

string plus = a.ToString();

string minus = b.ToString();

string multi = c.ToString();

string divide = d.ToString();

string modul = e.ToString();

int l = splitting2(expressme);

int flag = 0;

foreach (string lastme in save3)

{

if (check\_identifier(lastme) == 1)

{

input = 0;

// Console.WriteLine("identifier");

}

else if (lastme == plus || lastme == minus || lastme == multi || lastme == divide || lastme == modul)

{

input = 1;

// Console.WriteLine("operator");

}

else if (check\_simpleno(lastme) == 1)

{

input = 2;

// Console.WriteLine("simple number");

}

else

{

input = 3;

}

state = table[state, input];

if (state == 3)

{

flag = 1;

}

else

{

flag = 0;

}

}

if (flag == 1)

{

// Console.WriteLine("expressing");

return 1;

}

else

{

// Console.WriteLine("not expressing");

return 0;

}

}

int splitting2(string state\_ment)

{

Console.WriteLine();

// Console.WriteLine("expression: {0} ",state\_ment);

char[] str = state\_ment.ToCharArray();

string[] split = state\_ment.Split(new char[] { '+', '/', '-', '\*', '%' }, StringSplitOptions.RemoveEmptyEntries);

var str1 = new List<string>();

str1.Clear();

int from = 0;

int testme = 0;

// Console.WriteLine("max capacity {0} ",str1.Count);

//hello=num;

//5

//

// Console.WriteLine("split array lenght {0}",split.Length);

foreach (string ch in split)

{

// Console.WriteLine("string {0} length {1}",ch,ch.Length);

str1.Add(ch);

// Console.WriteLine("inserting {0}",ch);

if (from + ch.Length + testme < str.Length)

{

from = ch.Length + from;

// Console.WriteLine("{0} {1}",from,str[from+testme]);

str1.Add(str[from + testme].ToString());

testme++;

}

// Console.WriteLine("list count {0} from {1} testme {2}",str1.Count,from,testme);

}

// Console.WriteLine("data in list str1 {0}",str1.Count);

int cap = str1.Count;

save3 = new String[cap];

int count = 0;

// Console.WriteLine("transferring list count= {0}",str1.Count);

foreach (string hh in str1)

{

// Console.WriteLine(hh);

save3[count] = hh.ToString();

// Console.WriteLine(save3[count]);

count++;

}

return 1;

}

public static void Main(string[] args)

{

Program a = new Program();

int[,] table = new int[,] {

{1,5,5,5,5,5},

{5,2,5,4,5,5},

{1,5,3,5,5,3},

{5,5,5,4,5,5},

{5,5,5,5,5,5}

};

string statement;

/\*getting the string statement \*/

statement = Console.ReadLine();

Console.WriteLine (statement);

int h = 0;

int state = 0;

int input;

char eq = '=';

char semi = ';';

string equall = eq.ToString();

string semicol = semi.ToString();

int flag = 0;

/\*splitting the statement \*/

h = a.splitting(statement);

// Console.WriteLine(a.save2.Length);

// valid statement operation

foreach (string testme in a.save2)

{

try

{

// Console.ReadKey(true);

if (a.check\_identifier(testme) == 1)

{

input = 0;

// Console.WriteLine("identifier");

} /\*

else if (a.check\_simpleno(testme)==1)

{

Console.WriteLine("simple number");

}\*/

else if (testme == equall)

{

input = 1;

// Console.WriteLine("equal detected");

}

else if (a.check\_expression(testme) == 1)

{

input = 2;

// Console.WriteLine("expression");

}

else if (testme == semicol)

{

input = 3;

// Console.WriteLine("semi");

}

else if (a.check\_simpleno(testme) == 1)

{

input = 5;

// Console.WriteLine("simple number");

}

else

{

input = 4;

// Console.WriteLine("error detected");

}

state = table[state, input];

if (state == 4)

{

flag = 1;

}

}

catch (Exception)

{

Console.WriteLine("error");

}

}

if (flag == 1)

{

Console.WriteLine("VALID ASSIGNMENT STATEMENT");

}

else

{

Console.WriteLine("INVALID ASSIGNMENT STATEMENT");

}

// TODO: Implement Functionality Here

Console.Write("Press any key to continue . . . ");

Console.ReadKey(true);

}

}

}