Automata LAB

Assignment no.9

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Batch: IT-B

Q1: Construct the grammar for the following languages and write c program for it.

a) L = { wwR | w belongs to ∑* }

b) L = { wcwR

| w belongs to ∑

* }

Answer:

S -> aSa   S -> bSb   S -> aa   S -> bb

Code:

```
#include <bits/stdc++.h>

using namespace std;

bool S(string s)

{

if (s.length() > 2)

{

if (s[0] == s[s.length() - 1])

return S(s.substr(1, s.length() - 2));
```

```
else

return false;

}

else

{

if (s == "aa" || s == "bb")

return true;

else

return false;

}

}

int main()

{

string s;

cout << "Enter a String for testing : ";

cin >> s;

if (S(s))

cout << "Accepted";

else

cout << "Rejected";

}
```

B)

S -> aSa   S -> bSb S -> cSc

Code:

```
#include <bits/stdc++.h>

using namespace std;
```

```cpp
bool S(string s)
{
if (s.length() > 2)
{
if (s[0] == s[s.length() - 1])
return S(s.substr(1, s.length() - 2));
else
return false;
}
else
{
if (s == "c")
return true;
else
return false;
}
}
int main()
{
string s;
cout << "Enter a String for testing : ";
cin >> s;
if (S(s))
cout << "Accepted";
else
cout << "Rejected";
```

}

Q2: Convert the given DFA into regular grammar and write c program

for it.

S -> aS S -> bA

A -> aA A -> bA A -> b

Code ->

```
#include <bits/stdc++.h>

using namespace std;

bool A(string s)

{

if (s.length() == 1 && s[0] == 'b')

return true;

else if (s.length() == 1)

return false;

else

return A(s.substr(1, s.length() - 1));

}

bool S(string s)

{

if (s.length() == 1)

return false;

else

{

if (s[0] == 'a')
```

```cpp
        return S(s.substr(1, s.length() - 1));

    else

        return A(s.substr(1, s.length() - 1));

    }

}

int main()

{

string s;

cout << "Enter a String for testing : ";

cin >> s;

if (S(s))

cout << "Accepted";

else

cout << "Rejected";
```

Q3: Write a c program to check whether the given grammar is regular or not.

```c
#include<stdio.h>

#include<conio.h>

#include<string.h>

void main() {

        char string[50];

        int flag,count=o;

        clrscr();

        printf("The grammar is: S->aS, S->Sb, S->ab\n");

        printf("Enter the string to be checked:\n");
```

```c
gets(string);
if(string[0]=='a') {

        flag=0;

        for (count=1;string[count-1]!='\0';count++) {

                if(string[count]=='b') {

                        flag=1;

                        continue;

                } else if((flag==1)&&(string[count]=='a')) {

                        printf("The string does not belong to the specified grammar");

                        break;

                } else if(string[count]=='a')

                continue; else if(flag==1)&&(string[count]='\0')) {

                        printf("String accepted…..!!!!");

                        break;

                } else {

                        printf("String not accepted");

                }

        }
}
getch();

}
```