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BRANCH:- CSE DEPT.

## ASSIGNMENT - 12

Q1) .Implement Turing machine in C/C++.

Ans:-

```
#include<stdio.h>
#include<string.h>
#include<stdbool.h>

bool acception(char str[]){
    //to check string part of 1 where no. of 1 and 0 is same and
    //the string starts with 1;
    int state=0;
    int motion=1;
    int n=0;
    while(motion){
        printf("state=%d, str=%c, %s\n",state,str[n],str);
        if(state==0){
            if(str[n]=='1'){
                state=1;
                str[n]='X';
                n++;
                continue;
            }
            else if(str[n]=='Y'){
                n++;
                continue;
            }
            else if(str[n]=='\0'){
                state=3;
                return true;
            }
            else return false;
        }
        else if(state==1){
            if(str[n]=='1'){
```

```

        n++;
        continue;
    }
    else if(str[n]=='0'){
        state=2;
        str[n]='Y';
        n--;
        continue;
    }
    else if(str[n]='Y'){
        n++;
        continue;
    }
    else return false;
}

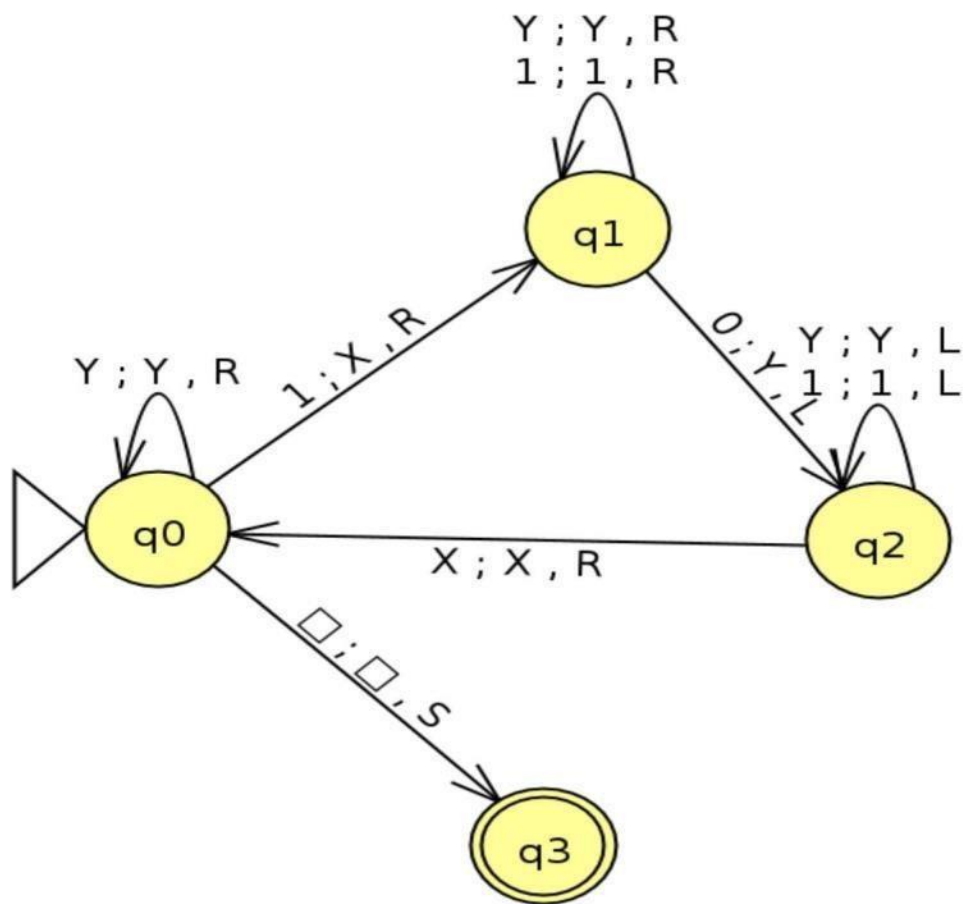
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```

        else if(state==2){
            if(str[n]=='1'){
                n--;
                continue;
            }
            else if(str[n]=='X'){
                state=0;
                n++;
                continue;
            }
            else if(str[n]=='Y'){
                n--;
                continue;
            }
            else return false;
        }
    }
    // if(state==3) return true;
    return false;
}

int main(){
    char str[20];
    printf("input:");
    scanf("%s",str);
    if(acception(str)){
        printf("accepted\n");
    }
    else printf("rejected\n");
    return 0;
}

```



**2. Construct a Turing machine for recognizing the language  $1^n 0^n$  where  $n > 0$ .**

```
#include<stdio.h>
#include<stdbool.h>
#include<string.h>

bool oneZero(char str[]){
    int n=0;
    int one=0;
    int len=strlen(str);
    while(n<len){
        //printf("%d=%c",n,str[n]);
        if(str[n]=='0') break;
        else if(str[n]=='1') one++;
        else return false;
        n++;
    }
    while(one--){
        //printf("%d=%c",n,str[n]);
        if(str[n]!='0') return false;
        n++;
    }
    if(str[n]!='\0') return false;
    return true;
}

int main(){
    char str[20];
    printf("input:");
    scanf("%s",str);
    if(oneZero(str)){
        printf("part of L\n");
        return 0;
    }
    printf("not part of L\n");
    return 0;
}
```

