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ASSIGNMENT - 03

1). Consider a finite state automata on (DFA) that accepts all the strings that consist of the symbols 0 and 1 where the amount of 0's is divisible by 2 (even amount of 0's) and the amount of 1's is divisible by 3.

Ans:-

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

int main()
{
char str[100];
printf("Enter a string : ");
scanf("%s",str);
int x = 0,y = 0;
for(int i = 0; i<strlen(str); i++)
{
        if(str[i] == '0')
         y++;
         else
         x++;
```

```
}

if(y%2 == 0 && x%3 == 0)
{
 printf("VALID STRING\n");
}
else
{
 printf("INVALID STRING\n");
}

return 0;
}

/*OUTPUT
Enter a string : 00111
VALID STRING
*/
```

2). Draw a deterministic finite automaton (DFA) for the language of all strings over the alphabet{0,1}that do not contain the substring 110.

Ans:-

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

int main()
{
char str[100];
int a = 0;
printf("Enter the string : ");
scanf("%s",str);
for(int i = 0; i<strlen(str) - 2 ;i++)
{
```

```
    if(str[i] == '1' && str[i+1] == '1' && str[i+2] == '0')
    {
        printf("INVALID STRING\n");
         a = 1;
         break;
    }
}

if(a == 0)
{
    printf("VALID STRING\n");
}

return 0;
}

/*OUTPUT
Enter the string : 0100010101010001 01
VALID STRING
*/
```

3). Draw a deterministic finite automaton (DFA) for the language of all strings over the alphabet{0,1}that ends in 010 or 101.

```
Ans:-  #include<stdio.h>
#include<string.h>

int main()
{
char str[100];
int a = 0;
printf("Enter the string : ");
```

```
scanf("%s",str);
int n = strlen(str);
if(str[n-1] == '1' && str[n-2] == '0' && str[n-3] == '1')
{
	printf("VALID STRING\n");
}

else if(str[n-1] == '0' && str[n-2] == '1' && str[n-3] == '0')
{
	printf("VALID STRING\n");
}
else
{
	printf("INVALID STRING\n");
}

return 0;
}

/*OUTPUT
Enter the string :  0100010101010001 01
VALID STRING
*/
```

4). Draw a deterministic finite automaton (DFA) for the language of all strings over the alphabet{a,b}that begins and ends with the same symbol with total length at least 2.

Ans:-

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

int main()
```

```
{

char str[100];
printf("Enter the string : ");
scanf("%s",str);
if(strlen(str) < 2)
{
        printf("INVALID STRING\n");
        return -1;
}

int n = strlen(str);
if(str[0] == str[n-1])
{
         printf("VALID STRING\n");
}
else
{
        printf("INVALID STRING\n");
}

return 0;
}
/*OUTPUT
Enter the string : abbababa
VALID STRING
*/
```