Aim: Algorithm to implement data link layer error detection method 'checksum'

Program

```c
#include<stdio.h>

#include<string.h>

int main()

{

char a[20],b[20];

char sum[20],complement[20];

int i,length;

printf("Enter first binary string\n");

scanf("%s",a);

printf("Enter second binary string\n");

scanf("%s",b);

if(strlen(a)==strlen(b))

{

length=strlen(a);

char carry='0';

for(i=length-1;i>=0;i--)

{

if(a[i]=='0'&&b[i]=='0'&&carry=='0')

{ sum[i]='0'; carry='0';

}

else if(a[i]=='0'&&b[i]=='0'&&carry=='1')

{

sum[i]='1';

carry='0';

}

else if(a[i]=='0'&&b[i]=='1'&&carry=='0')

{
```

```c
sum[i]='1'; carry='0';
}
else if(a[i]=='0'&&b[i]=='1'&&carry=='1')
{
sum[i]='0';
carry='1';
}
else if(a[i]=='1'&&b[i]=='0'&&carry=='0')
{
sum[i]='1';
carry='0';
}
else if(a[i]=='1'&&b[i]=='0'&&carry=='1')
{
sum[i]='0';
carry='1';
}
else if(a[i]=='1'&&b[i]=='1'&&carry=='0')
{
sum[i]='0';
carry='1';
}
else if(a[i]=='1'&&b[i]=='1'&&carry=='1')
{
sum[i]='1';
carry='1';
}
else break;
}
```

```c
printf("\n Carry=%c, Sum=%s",carry,sum);
for(i=length-1;i>0;i--)
{
if(sum[i]=='1'&& carry=='1')
{
sum[i]='0'; carry='1';
}
else if(sum[i]=='0'&& carry=='1')
{
sum[i]='1';
break;
}
else
break;
}
for(i=0;i<length;i++)
{
if(sum[i]=='0')
complement[i]='1';
else
complement[i]='0';
}
printf("\nChecksum=%s",complement);
}
else
{
printf("\n Wrong input Strings");
}
}
```

OUTPUT

```
Enter first binary string
1111
Enter second binary string
1010

 Carry=1, Sum=1001
Checksum=0101

=== Code Execution Successful ===
```