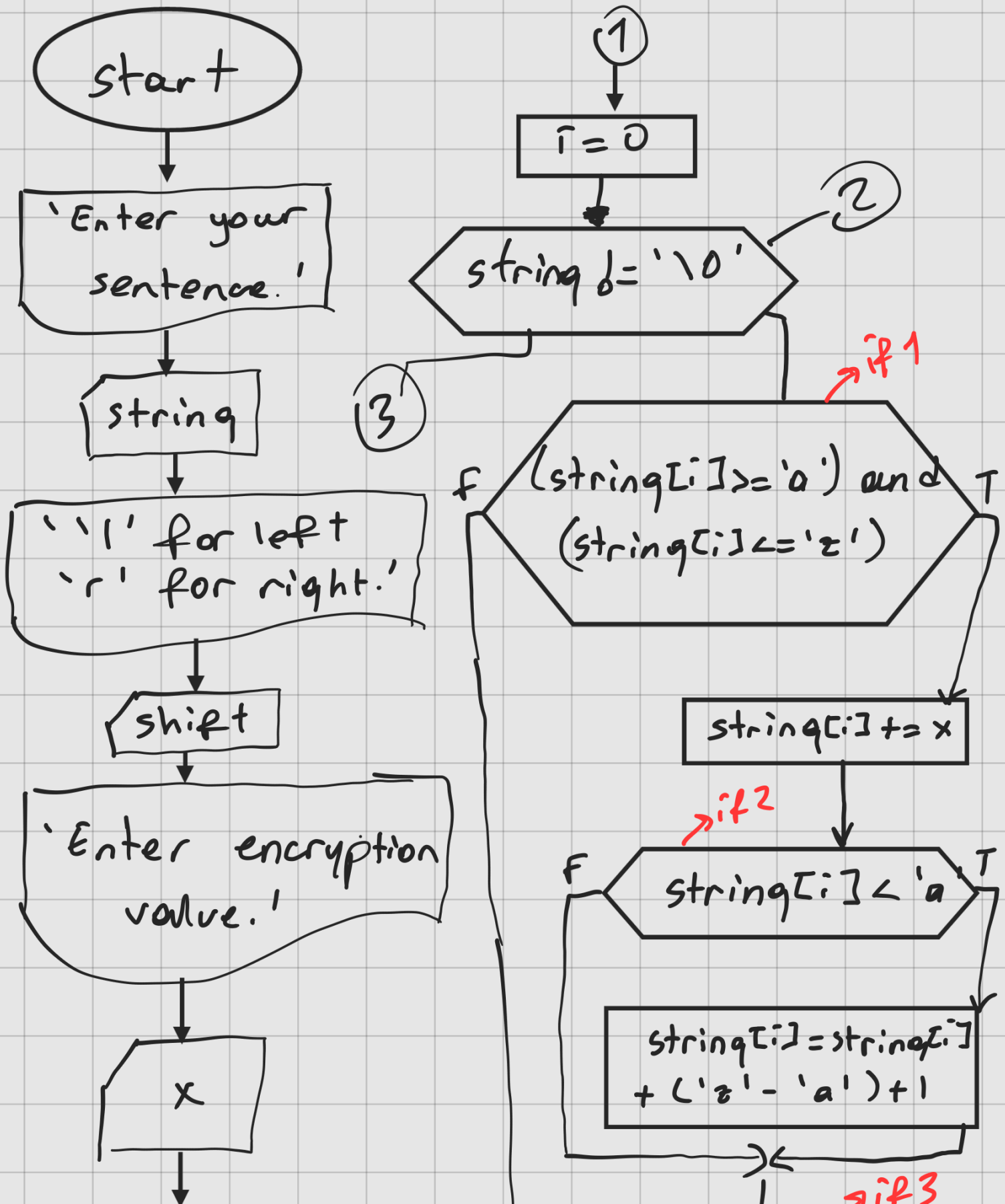
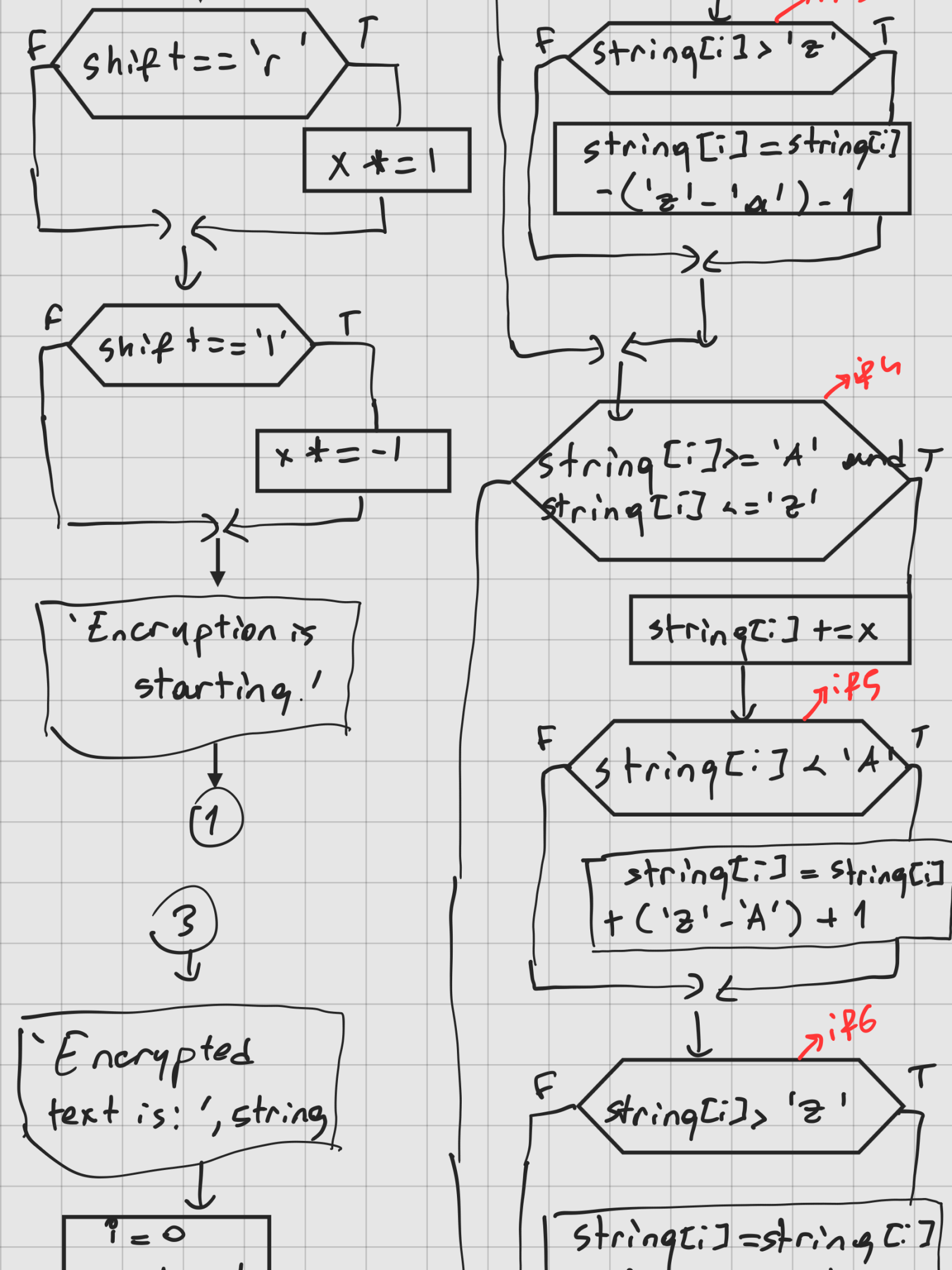
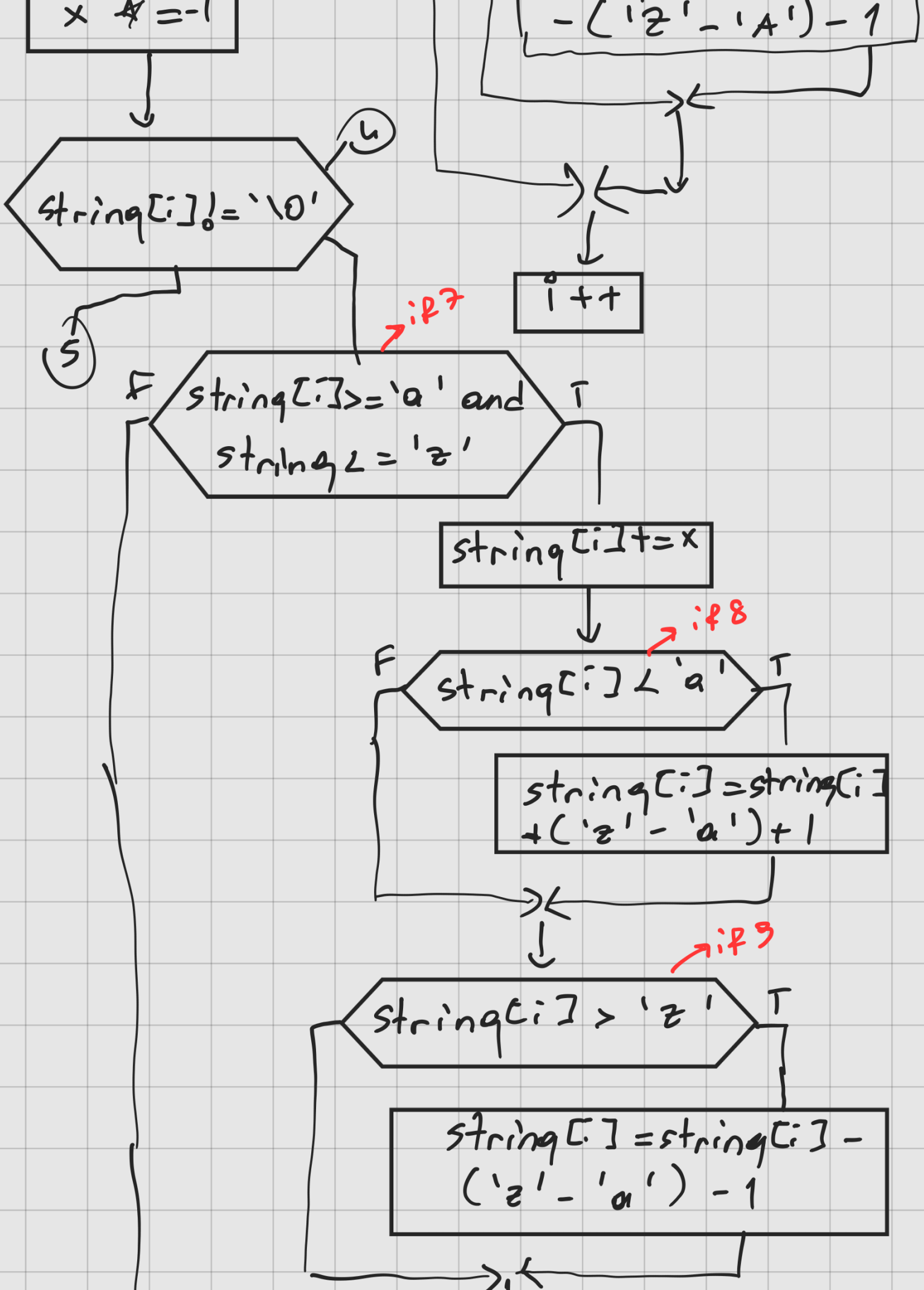
flowchart + Analysis + Source Code.

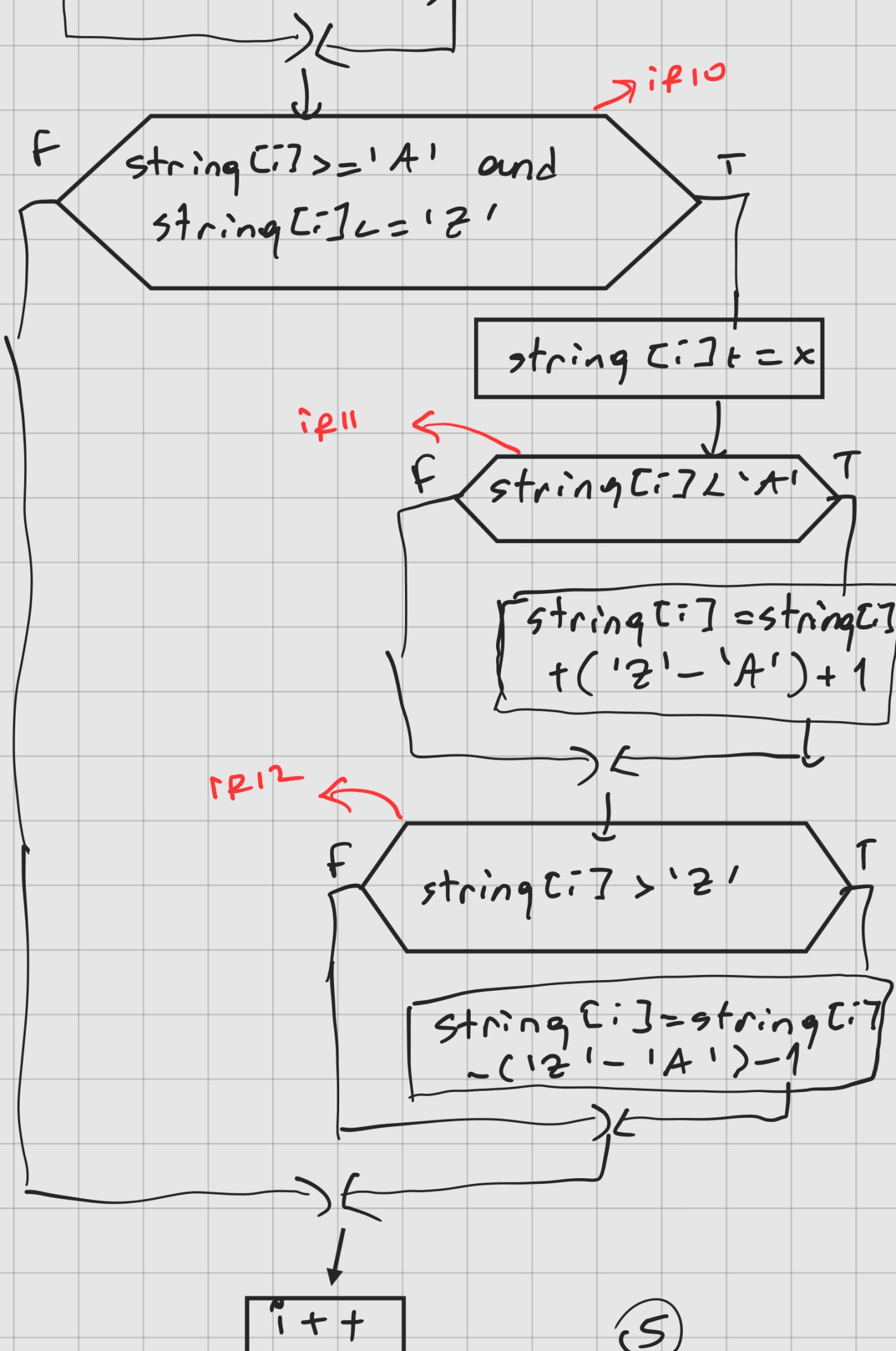
Algorithm 1: Design an algorithm and write the program which encrypts the given text based on the following formula and decrypts it into the original form.

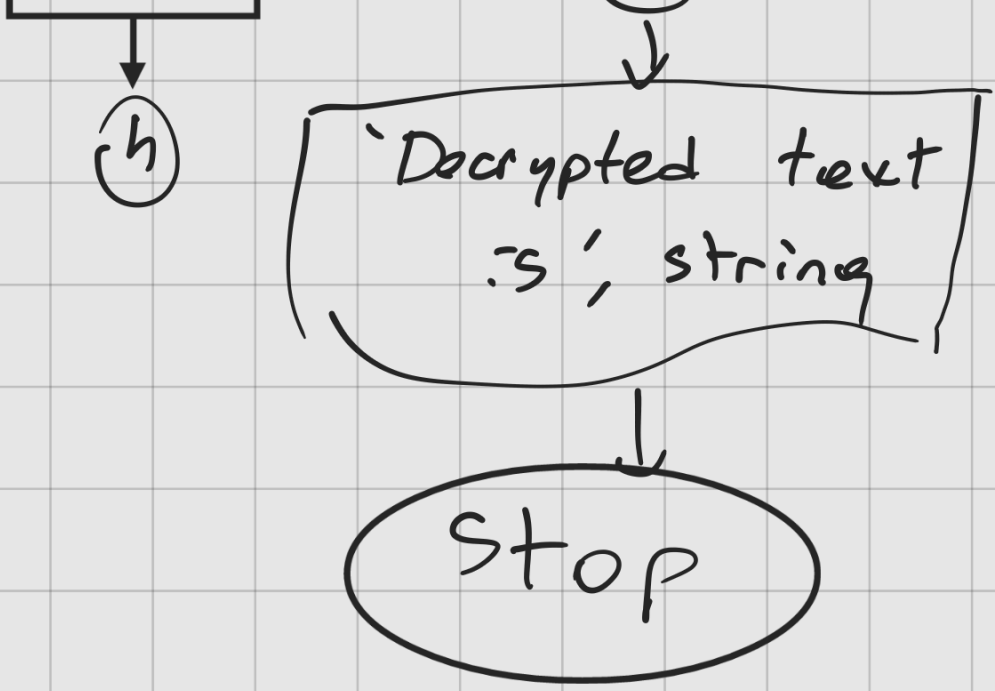
Shift = "left" ------ > letter – X -> newletter
shift = "right -----→ letter + X -> newletter




F
shift == 'r'
T
x *= 1
F
shift == 'l'
T
x *= -1
`Encryption is starting.'
1
3
`Encrypted text is: ', string
i = 0
F
string[i] > 'z'
T
string[i] = string[i] -('z'-'a')-1
if4
string[i] >= 'A' and string[i] <= 'z'
T
string[i] += x
if5
F
string[i] < 'A'
T
string[i] = string[i] + ('z'-'A') + 1
if6
F
string[i] > 'z'
T
string[i] = string[i]


x *=-1
-('Z'-'A')-1
4
string[i]!='\0'
5
i++
if7
F
string[i]>='a' and
string[i]<='z'
T
string[i]+=x
if8
F
string[i]<'a'
T
string[i]=string[i]
+('z'-'a')+1
if9
string[i]>'z'
T
string[i]=string[i]-
('z'-'a')-1


if10
F
string[i]>='A' and
string[i]<='Z'
T
string[i]+=x
if11
F
string[i]<'A'
T
string[i]=string[i]
+('Z'-'A')+1
if12
F
string[i]>'Z'
T
string[i]=string[i]
-('Z'-'A')-1
i++
5



Analiz

Example 1:

Text= I love this game.

Shift = left

X=1

Answer:

Encrypted Text: H knud sghr fzld.

Decrypted Text: I love this game.

i	shift x	string[i]	Hangi if'te	işlem
0	l -1	I → H	if4	'I' - 1 = H
1	e -1	_	x	x
2	l -1	l → k	if1	'l' - 1 = k
3	l -1	o → n	if1	'o' - 1 = n

4	ℓ -1	v → u	if 1	'v'-1=u
5	ℓ -1	e → d	if 1	'e'-1=d
6	ℓ -1	_	x	x
7	ℓ -1	t → s	if 1	't'-1=s
8	ℓ -1	h → g	if 1	'h'-1=g
9	ℓ -1	i → h	if 1	'i'-1=h
10	ℓ -1	s → r	if 1	's'-1=r
11	ℓ -1	_	x	x
12	ℓ -1	g → f	if 1	'g'-1=f
13	ℓ -1	a → z	if 1 + if 2	'a'-1 + ('z'-'a') +1='z'
14	ℓ -1	m → ℓ	if 1	'm'-1=ℓ
15	ℓ -1	e → d	if 1	'e'-1=d
16	ℓ -1	.	x	x
17	ℓ -1	null → while'dom aik.		

Encrypted text: H knud sghr fzld.

Decryption d

0	1	xx-1=1	H → I	if 10	'H'+1='I'
1	ℓ	1	_	x	x
2	ℓ	1	k → ℓ	if 7	'k'+1='ℓ'
3	ℓ	1	n → o	if 7	'n'+1='o'
4	ℓ	1	u → v	if 7	'u'+1='v'

5	i	1	d → e	if 7	'd'+1='e'
6	i	1	-	x	x
7	i	1	s → t	if 7	's'+1='t'
8	i	1	q → h	if 7	'q'+1='h'
9	i	1	h → i	if 7	'h'+1='i'
10	i	1	r → s	if 7	'r'+1='s'
11	i	1	—	x	x
12	i	1	f → g	if 7	'f'+1='g'
13	i	1	z → a	if 7+if 9	'z'+1-('z'-'a')-1
14	i	1	l → m	if 7	'l'+1='m'
15	i	1	d → e	if 7	'd'+1='e'
16	i	1	.	x	x
17	i	1	'\0' → while 'dan aik		

Decrypted text is: I love this game.

Example 2:

Text= How old are you?

Shift = right

X=2

Answer:

Encrypted Text: Jqy qnf ctg aqw?

Decrypted Text: How old are you?

i	shift	x	string[i]	hangi if'te	işlem
0	r	2	H → J	if 4	'H'+2='J'
1	r	2	o → q	if 1	'o'+2='q'
2	r	2	w → y	if 1	'w'+2='y'
3	r	2	-	x	x
4	r	2	o → q	if 1	'o'+2='q'
5	r	2	ı → n	if 1	'ı'+2='n'
6	r	2	d → f	if 1	'd'+2='f'
7	r	2	-	x	x
8	r	2	a → c	if 1	'a'+2='c'
9	r	2	r → t	if 1	'r'+2='t'
10	r	2	e → g	if 1	'e'+2='g'
11	r	2	-	(x)	(x)
12	r	2	y → a	if 1 + if 3	'y'+2 - ('z'-'a')-1 = 'a'
13	r	2	o → q	if 1	'o'+2='q'
14	r	2	v → w	if 1	'u'+2='w'
15	r	2	?	(x)	(x)
16	r	2	null	→ while'dan çık.	

Encrypted text: Dqy qnf ctq aqw?

Decryption:

Decrypted

0	r	x<4-1=-2	J → H	if 10	'J'-2='H'
1	r	-2	q → o	if 7	'q'-2='o'
2	r	-2	y → w	if 7	'y'-2='w'
3	r	-2	_	(x)	(x)
4	r	-2	q → o	if 7	'q'-2='o'
5	r	-2	n → l	if 7	'n'-2='l'
6	r	-2	f → d	if 7	'f'-2='d'
7	r	-2	_	(x)	(x)
8	r	-2	c → a	if 7	'a'-2='c'
9	r	-2	t → r	if 7	't'-2='r'
10	r	-2	g → e	if 7	'g'-2='e'
11	r	-2	_	(x)	(x)
12	r	-2	a → y	if 7 + if 8	'a'-2 + ('z'-'a')+1 = 'y'
13	r	-2	q → o	if 7	'q'-2='o'
14	r	-2	w → ␣	if 7	'w'-2='␣'
15	r	-2	?	(x)	(x)
16	r	-2	'\0' → null → while 'don ich.		

Decrypted text: How old are you?

Example 3:
Text= I am 60 years old.

Shift = right

X=3

Answer:

Encrypted Text: L dp 60 bhduv rog.

Decrypted Text: I am 60 years old.

i	shift	x	string[i]	hangi if'te	işlem
0	r	3	I → L	if 4	'I'+3='L'
1	r	3	-	(x)	(x)
2	r	3	a → d	if 1	'a'+3='d'
3	r	3	m → p	if 1	'm'+3='p'
4	r	3	-	(x)	(x)
5	r	3	6	(x)	(x)
6	r	3	0	(x)	(x)
7	r	3	-	(x)	(x)
8	r	3	y → b	if 1 + if 3	'y'+3-('z'-'a') -1='b'
9	r	3	e → h	if 1	'e'+3='h'
10	r	3	a → d	if 1	'a'+3='d'
11	r	3	r → u	if 1	'r'+3='u'
12	r	3	s → v	if 1	's'+3='v'
13	r	3	-	(x)	(x)
14	r	3	0 → r	if 1	'0'+3='r'
15	r	3	(→ 0	if 1	'('+3='0'

16	r	3	d → g	if 1	'd'+3='g'
17	r	3	.	✗	✗
18	r	3	null → while 'done with.		

Encrypted text: L dp 60 b hduv rog.

Decryption ↓

0	r	x*-1=-3	L → I	if 10	'L'-3='I'
1	r	-3	—	✗	✗
2	r	-3	d → a	if 7	'd'-3='a'
3	r	-3	p → m	if 7	'p'-3='m'
4	r	-3	—	✗	✗
5	r	-3	6	✗	✗
6	r	-3	0	✗	✗
7	r	-3	—	✗	✗
8	r	-3	b → y	if 7 + if 8	'b'-3+(ord('z')-ord('a'))+1
9	r	-3	h → e	if 7	'h'-3='e'
10	r	-3	d → a	if 7	'd'-3='a'
11	r	-3	␣ → r	if 7	'␣'-3='r'
12	r	-3	v → s	if 7	'v'-3='s'
13	r	-3	—	✗	✗
14	r	-3	r → o	if 7	'r'-3='o'
15	r	-3			

15 r -3 o → l if 7 'o'-3='l'

16 r -3 g → d if 7 'g'-3='d'

17 r -3 • ✗ ✗

18 r -3 '\0' → while loop ends.

Decrypted text : I am 60 years old.

Source Code.

```
#include <stdio.h>

#define MAX 50

int main()
{
char string[MAX],encrypted_text[MAX];
char shift,temp;
int x,i;

puts("Please enter your sentence.");
gets(string);
puts(">>>>Your input sentence is: ");
puts(string);
```

```
do
{
puts("\nPlease enter shift value. 'l' for left
'r' for right ");
shift=getc(stdin);
}while((shift!='l')&&(shift!='r'));

do
{
puts("\nPlease enter encryption value.It
has to be above 0.");
scanf("%d",&x);
}while(x<=0);
if(shift=='r')
{
x*=1;
}
else if(shift=='l')
{
x*=-1;
}
```

```
else
{
printf("The shift value is wrong.Exiting...");
exit(-1);
}
puts("[INFO]Encryption is
starting...Loading...");
i=0;
while(string[i]!='\0')
{
if(((string[i]>='a')&&(string[i]<='z'))) //if1
{
string[i]+=x;
if((string[i]<'a')) //2
{
string[i]=string[i]+('z'-'a')+1;
}
else if((string[i]>'z')) //3
{
string[i]=string[i]-('z'-'a')-1;
}
```

```
}
else
if(((string[i]>='A')&&(string[i]<='Z'))) //4
{
string[i]+=x;
if((string[i]<'A')) //5
{
string[i]=string[i]+('Z'-'A')+1;
}
else if((string[i]>'Z')) //6
{
string[i]=string[i]-('Z'-'A')-1;
}
}
i++;
}
puts(">>>>Encrypted string is: ");
puts(string);

puts("[INFO]Decryption is
starting...Loading...");
```

```
i=0;
x*=-1;
while(string[i]!='\0')
{
if(((string[i]>='a')&&(string[i]<='z'))) //7
{
string[i]+=x;
if((string[i]<'a')) //8
{
string[i]=string[i]+('z'-'a')+1;
}
else if((string[i]>'z')) //9
{
string[i]=string[i]-('z'-'a')-1;
}
}
else
if(((string[i]>='A')&&(string[i]<='Z'))) //10
{
string[i]+=x;
if((string[i]<'A')) //11
```

```
{
string[i]=string[i]+('Z'-'A')+1;
}
else if((string[i]>'Z')) //12
{
string[i]=string[i]-('Z'-'A')-1;
}
}
i++;
}
puts(">>>>>Dencrypted string is: ");
puts(string);
return 0;
}
```