

Section: B11

Rollno: 150039

Name: Abhijit Panchal

Question 1. (7 points) Consider the program given below.

```

1 #include <stdio.h>
2 #include <string.h>
3 int cs(char a[20], char b[20]) {
4     int c[256];
5     int i, j, m, n, r = 0;
6
7     for (i=0; i<256; i++)
8         c[i]=0;
9
10    m = strlen(a);    m=3
11    n = strlen(b);    n=3
12
13    if (n != m) return -1;
14
15    for (i=0; i<n; i++)
16        c[b[i]]++;    c['B']++    c['B']-1    c['A']=0
17
18    for (i=0; i<n; i++)
19        c[a[i]]--;    c['A']-1    c['B']=0
20
21    for (i=0; i<256; i++)
22        if (c[i]!=0) return -2;    c['C']=1    c['C']=0
23
24    for (i=n-1, j=n-1; i>=0; ) {
25        while (i>=0 && a[i] != b[j]) {
26            i--;
27            r++;
28        }
29        if (i >= 0) {
30            i--;
31            j--;
32        }
33    }
34    return r;
35 }
36
37 int main() {
38     char s[20], t[20];
39     scanf("%s", s);
40     scanf("%s", t);
41     printf("Output = %d\n", cs(s, t));
42     return 0;
43 }

```

Handwritten notes and diagrams:

- Initial state:  $i=2, j=2$
- After first loop:  $i=2, j=1, r=1$  (circled)
- After second loop:  $i=1, j=1, r=2$
- After third loop:  $i=1, j=0, r=1$
- After fourth loop:  $i=0, j=1, r=2$
- After fifth loop:  $i=0, j=0, r=2$  (circled)
- After sixth loop:  $i=0, j=0, r=2$
- After seventh loop:  $i=0, j=0, r=2$
- After eighth loop:  $i=0, j=0, r=2$
- After ninth loop:  $i=0, j=0, r=2$
- After tenth loop:  $i=0, j=0, r=2$
- After eleventh loop:  $i=0, j=0, r=2$
- After twelfth loop:  $i=0, j=0, r=2$
- After thirteenth loop:  $i=0, j=0, r=2$
- After fourteenth loop:  $i=0, j=0, r=2$
- After fifteenth loop:  $i=0, j=0, r=2$
- After sixteenth loop:  $i=0, j=0, r=2$
- After seventeenth loop:  $i=0, j=0, r=2$
- After eighteenth loop:  $i=0, j=0, r=2$
- After nineteenth loop:  $i=0, j=0, r=2$
- After twentieth loop:  $i=0, j=0, r=2$
- After twenty-first loop:  $i=0, j=0, r=2$
- After twenty-second loop:  $i=0, j=0, r=2$
- After twenty-third loop:  $i=0, j=0, r=2$
- After twenty-fourth loop:  $i=0, j=0, r=2$
- After twenty-fifth loop:  $i=0, j=0, r=2$
- After twenty-sixth loop:  $i=0, j=0, r=2$
- After twenty-seventh loop:  $i=0, j=0, r=2$
- After twenty-eighth loop:  $i=0, j=0, r=2$
- After twenty-ninth loop:  $i=0, j=0, r=2$
- After thirtieth loop:  $i=0, j=0, r=2$
- After thirty-first loop:  $i=0, j=0, r=2$
- After thirty-second loop:  $i=0, j=0, r=2$
- After thirty-third loop:  $i=0, j=0, r=2$
- After thirty-fourth loop:  $i=0, j=0, r=2$
- After thirty-fifth loop:  $i=0, j=0, r=2$
- After thirty-sixth loop:  $i=0, j=0, r=2$
- After thirty-seventh loop:  $i=0, j=0, r=2$
- After thirty-eighth loop:  $i=0, j=0, r=2$
- After thirty-ninth loop:  $i=0, j=0, r=2$
- After fortieth loop:  $i=0, j=0, r=2$
- After forty-first loop:  $i=0, j=0, r=2$
- After forty-second loop:  $i=0, j=0, r=2$
- After forty-third loop:  $i=0, j=0, r=2$
- After forty-fourth loop:  $i=0, j=0, r=2$
- After forty-fifth loop:  $i=0, j=0, r=2$
- After forty-sixth loop:  $i=0, j=0, r=2$
- After forty-seventh loop:  $i=0, j=0, r=2$
- After forty-eighth loop:  $i=0, j=0, r=2$
- After forty-ninth loop:  $i=0, j=0, r=2$
- After fiftieth loop:  $i=0, j=0, r=2$
- After fifty-first loop:  $i=0, j=0, r=2$
- After fifty-second loop:  $i=0, j=0, r=2$
- After fifty-third loop:  $i=0, j=0, r=2$
- After fifty-fourth loop:  $i=0, j=0, r=2$
- After fifty-fifth loop:  $i=0, j=0, r=2$
- After fifty-sixth loop:  $i=0, j=0, r=2$
- After fifty-seventh loop:  $i=0, j=0, r=2$
- After fifty-eighth loop:  $i=0, j=0, r=2$
- After fifty-ninth loop:  $i=0, j=0, r=2$
- After sixtieth loop:  $i=0, j=0, r=2$
- After sixty-first loop:  $i=0, j=0, r=2$
- After sixty-second loop:  $i=0, j=0, r=2$
- After sixty-third loop:  $i=0, j=0, r=2$
- After sixty-fourth loop:  $i=0, j=0, r=2$
- After sixty-fifth loop:  $i=0, j=0, r=2$
- After sixty-sixth loop:  $i=0, j=0, r=2$
- After sixty-seventh loop:  $i=0, j=0, r=2$
- After sixty-eighth loop:  $i=0, j=0, r=2$
- After sixty-ninth loop:  $i=0, j=0, r=2$
- After seventieth loop:  $i=0, j=0, r=2$
- After seventy-first loop:  $i=0, j=0, r=2$
- After seventy-second loop:  $i=0, j=0, r=2$
- After seventy-third loop:  $i=0, j=0, r=2$
- After seventy-fourth loop:  $i=0, j=0, r=2$
- After seventy-fifth loop:  $i=0, j=0, r=2$
- After seventy-sixth loop:  $i=0, j=0, r=2$
- After seventy-seventh loop:  $i=0, j=0, r=2$
- After seventy-eighth loop:  $i=0, j=0, r=2$
- After seventy-ninth loop:  $i=0, j=0, r=2$
- After eightieth loop:  $i=0, j=0, r=2$
- After eighty-first loop:  $i=0, j=0, r=2$
- After eighty-second loop:  $i=0, j=0, r=2$
- After eighty-third loop:  $i=0, j=0, r=2$
- After eighty-fourth loop:  $i=0, j=0, r=2$
- After eighty-fifth loop:  $i=0, j=0, r=2$
- After eighty-sixth loop:  $i=0, j=0, r=2$
- After eighty-seventh loop:  $i=0, j=0, r=2$
- After eighty-eighth loop:  $i=0, j=0, r=2$
- After eighty-ninth loop:  $i=0, j=0, r=2$
- After ninetieth loop:  $i=0, j=0, r=2$
- After ninety-first loop:  $i=0, j=0, r=2$
- After ninety-second loop:  $i=0, j=0, r=2$
- After ninety-third loop:  $i=0, j=0, r=2$
- After ninety-fourth loop:  $i=0, j=0, r=2$
- After ninety-fifth loop:  $i=0, j=0, r=2$
- After ninety-sixth loop:  $i=0, j=0, r=2$
- After ninety-seventh loop:  $i=0, j=0, r=2$
- After ninety-eighth loop:  $i=0, j=0, r=2$
- After ninety-ninth loop:  $i=0, j=0, r=2$
- After hundredth loop:  $i=0, j=0, r=2$



Name: Abhishek Panchal

Section: B11

Rollno: 150039

s	t	Output of Program
ABC	BAC	Output = <del>1</del> 1 ✓
DEF	DEF	Output = 0 ✓
DWEDF	EFDEW	Output = -2 ✓
RTIURF	TUIRT	Output = -1 ✓
ASDFGE	EGDSAF	Output = 3 ✗
QWEDFDR	QDFREWE	Output = -2 ✓
ASFDSDLKJHY	YHLKJFDSAS	Output = 4 ✗

(5)

A S F D S L K J H Y  
0 1 2 3 4 5 6 7 8 9Y H L K J F D S A S  
0 1 2 3 4 5 6 7 8 9



Name: Abhishek PanchalSection: B11Rollno: 150039

Question 2. (3 points) Consider the program given below.

```

1 #include <stdio.h>
2
3 int main()
4 {
5     int n,s,i,j,r=0;
6     printf("Input the number:\n");
7     scanf("%d", &n);
8
9     for (i=1; i<=n; i++){
10         j=i;
11         s=0;
12         while (j != 0) {
13             s = s + j%10 ;
14             j = j/10 ;
15         }
16         r = r + s;
17     }
18     printf("Output = %d\n",r);
19     return 0;
20 }

```

Handwritten calculations and notes:

- $s = 1+2+3+4+5+6+7+8+9+10+11$
- $r = (1+2+...+9) + (1+2+3+4+5+6+7+8+9+10) + (1+2+3+4+5+6+7+8+9+10+11)$
- $r = 45 + 55 = 100$
- $r = 45 + 21 = 66$
- $r = 45 + 109 = 154$

Fill the table given below with the output of the program for the given values of n.

n	Output of Program
19	Output = 100 ✓
15	Output = 66 ✓
22	Output = 109 ✓

(3)