CS2610 COA Lab exam

26 April 2022

Problem Definition

Given a choice value C followed by a string S or an integer N, you are expected to implement the following pseudocode.

```
if (C == 1) {
        Read the string S
        Do sub task 1 with string S
} else if ( C == 2 ) {
        Read the integer N
        Do sub task 2 with integer N
}
```

The details about the sub tasks are given below.

Sub task 1 (10 marks)

Given the string S, print the number of occurrences of consonants (alphabets that are not vowels) in the string.

For example, if the string is *Hello*, print 3 as the output.

An ASCII table is given at the end for your reference.

Sub task 2 (15 marks)

Given the integer N, print the value of *f(N)* where the function f is defined as:

$$f(x) = \begin{cases} f(x-1) + (x-1), & \text{if } x > 10 \\ 2 * x + 4 * f(x-2), & \text{if } x <= 10 \textit{ and } x > 7 \\ 9, & \text{if } x <= 7 \textit{ and } x > 0 \end{cases}$$

You can assume that the output fits in a signed 32-bit integer.

Your program should calculate the function value using the given input integer. Hardcoding function outputs for possible input values is **not allowed**.

Input format

- The first line of the input will contain the choice value C.
- The second line of the input will contain a string (for sub task 1) or an integer (for sub task 2).

Sample input 1

```
1
Hello
```

Sample input 2

```
2
14
```

Output format

- For both sub tasks, the output is just a single integer.
- Please do not print any other text. Follow the output format strictly.

Constraints

- C will have the value 1 or 2
- The length of the input string for sub task 1 will be between 1 and 20 (both inclusive)
- The input integer for sub task 2 will be between 1 and 20 (both inclusive)

Testcases

Testcase 1

Input

```
1
cdf
```

Expected Output

```
3
```

Testcase 2

Input

```
1
AdvArchitecture
```

Expected Output

```
9
```

Testcase 3

Input

```
2
8
```

Expected Output

```
52
```

Testcase 4

Input

```
2
1
```

Expected Output

9

Submission instructions

- The final code submission should be done on Moodle.
  Submission Link: https://courses.iitm.ac.in/mod/assign/view.php?id=26462
- Submit only a single assembly file named as roll_no.asm. If your roll number is cs20b123 then submit the assembly file as cs20b123.asm

Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char	Decimal	Hex	Char
0	0	[NULL]	32	20	[SPACE]	64	40	@	96	60	`
1	1	[START OF HEADING]	33	21	!	65	41	A	97	61	a
2	2	[START OF TEXT]	34	22	"	66	42	B	98	62	b
3	3	[END OF TEXT]	35	23	#	67	43	C	99	63	c
4	4	[END OF TRANSMISSION]	36	24	$	68	44	D	100	64	d
5	5	[ENQUIRY]	37	25	%	69	45	E	101	65	e
6	6	[ACKNOWLEDGE]	38	26	&	70	46	F	102	66	f
7	7	[BELL]	39	27	'	71	47	G	103	67	g
8	8	[BACKSPACE]	40	28	(	72	48	H	104	68	h
9	9	[HORIZONTAL TAB]	41	29	)	73	49	I	105	69	i
10	A	[LINE FEED]	42	2A	*	74	4A	J	106	6A	j
11	B	[VERTICAL TAB]	43	2B	+	75	4B	K	107	6B	k
12	C	[FORM FEED]	44	2C	,	76	4C	L	108	6C	l
13	D	[CARRIAGE RETURN]	45	2D	-	77	4D	M	109	6D	m
14	E	[SHIFT OUT]	46	2E	.	78	4E	N	110	6E	n
15	F	[SHIFT IN]	47	2F	/	79	4F	O	111	6F	o
16	10	[DATA LINK ESCAPE]	48	30	0	80	50	P	112	70	p
17	11	[DEVICE CONTROL 1]	49	31	1	81	51	Q	113	71	q
18	12	[DEVICE CONTROL 2]	50	32	2	82	52	R	114	72	r
19	13	[DEVICE CONTROL 3]	51	33	3	83	53	S	115	73	s
20	14	[DEVICE CONTROL 4]	52	34	4	84	54	T	116	74	t
21	15	[NEGATIVE ACKNOWLEDGE]	53	35	5	85	55	U	117	75	u
22	16	[SYNCHRONOUS IDLE]	54	36	6	86	56	V	118	76	v
23	17	[ENG OF TRANS. BLOCK]	55	37	7	87	57	W	119	77	w
24	18	[CANCEL]	56	38	8	88	58	X	120	78	x
25	19	[END OF MEDIUM]	57	39	9	89	59	Y	121	79	y
26	1A	[SUBSTITUTE]	58	3A	:	90	5A	Z	122	7A	z
27	1B	[ESCAPE]	59	3B	;	91	5B	[	123	7B	{
28	1C	[FILE SEPARATOR]	60	3C	<	92	5C	\	124	7C	|
29	1D	[GROUP SEPARATOR]	61	3D	=	93	5D	]	125	7D	}
30	1E	[RECORD SEPARATOR]	62	3E	>	94	5E	^	126	7E	~
31	1F	[UNIT SEPARATOR]	63	3F	?	95	5F	_	127	7F	[DEL]

Figure 1: ASCII table