National University of Computer and Emerging Sciences

Lab Manual # 1

Programming Fundamentals

(Section BCS-1B)

Course Instructor	Dr. Amir Wali
Lab Instructor(s)	Mr.Muhammad Naveed Mr. Faraz
Section	BCS-1A
Semester	Fall 2021

Department of Computer Science

FAST-NU, Lahore, Pakistan

Objectives

The objectives of this lab are to cover the following:

- What is a bit/byte/ASCII number system

ASCII Table

```
Dec  = Decimal Value
Char = Character

'5' has the int value 53
if we write '5'-'0' it evaluates to 53-48, or the int 5
if we write char c = 'B'+32; then c stores 'b'
```

Dec	Char	Dec	Char	Dec	Char	Dec	Char
0	NUL (null)	32	SPACE	64	@	96	`
1	SOH (start of heading)	33	!	65	A	97	a
2	STX (start of text)	34	"	66	B	98	b
3	ETX (end of text)	35	#	67	C	99	c
4	EOT (end of transmission)	36	$	68	D	100	d
5	ENQ (enquiry)	37	%	69	E	101	e
6	ACK (acknowledge)	38	&	70	F	102	f
7	BEL (bell)	39	'	71	G	103	g
8	BS (backspace)	40	(	72	H	104	h
9	TAB (horizontal tab)	41	)	73	I	105	i
10	LF (NL line feed, new line)	42	*	74	J	106	j
11	VT (vertical tab)	43	+	75	K	107	k
12	FF (NP form feed, new page)	44	,	76	L	108	l
13	CR (carriage return)	45	-	77	M	109	m
14	SO (shift out)	46	.	78	N	110	n
15	SI (shift in)	47	/	79	O	111	o
16	DLE (data link escape)	48	0	80	P	112	p
17	DC1 (device control 1)	49	1	81	Q	113	q
18	DC2 (device control 2)	50	2	82	R	114	r
19	DC3 (device control 3)	51	3	83	S	115	s
20	DC4 (device control 4)	52	4	84	T	116	t
21	NAK (negative acknowledge)	53	5	85	U	117	u
22	SYN (synchronous idle)	54	6	86	V	118	v
23	ETB (end of trans. block)	55	7	87	W	119	w
24	CAN (cancel)	56	8	88	X	120	x
25	EM (end of medium)	57	9	89	Y	121	y
26	SUB (substitute)	58	:	90	Z	122	z
27	ESC (escape)	59	;	91	[	123	{
28	FS (file separator)	60	<	92	\	124	|
29	GS (group separator)	61	=	93	]	125	}
30	RS (record separator)	62	>	94	^	126	~
31	US (unit separator)	63	?	95	_	127	DEL

- What is an algorithm?
- How do we write an algorithm in simple english?

Important Notes

- Be aware that you are asked to write algorithms in simple english language.
- You will be writing algorithms for sequential statements and conditional statements.
- Try to indent your program so that statements inside a block can be distinguished from another block

Question#1

Write an algorithm that takes input in two variables **number1 and number2.** Add these two numbers and store the result in **sum** variable. Print the sum.

Example Input:

Input 1: 3

Input 2: 7

Output:

Sum: 10

Question#2

Write an algorithm that takes as input a list of numbers from the user and then a number to search within it.

Example Input:

List: 12, 17, 3, 44, 77, 2, 1

Number to search: 2

Output: Number 2 exists in the list

Number to search: 21

Output: Number 21 does not exist in the list

Question#3

Write an algorithm that checks whether a list of numbers is sorted in ascending order.

Example Input:

List: 12, 17, 3, 44, 77, 2, 1

Output: List is not sorted in ascending order

List: 12, 17, 44, 77, 91

Output: List is sorted in ascending order.

Question#4

Four defenders in a football match — Defender A, Defender B, Defender C & Defender D — take their positions in this order in a row from left to right. During the match, Defender A changes places with Defender C and then Defender C changes places with Defender B.

Which defender is now at the left end of the row? who is to the right of Defender C?
(show your working)

Question#5

UNIVERSITY is coded in a code as UINVRESTIY. Find the code for SEQUENTIAL under the same rule.

Question#6

Suppose you have lost your watch. After brainstorming you remembered that last time you placed the watch in the cupboard that has 5 shelves. Now Write a pseudo code to search your watch in each shelve of the cupboard.