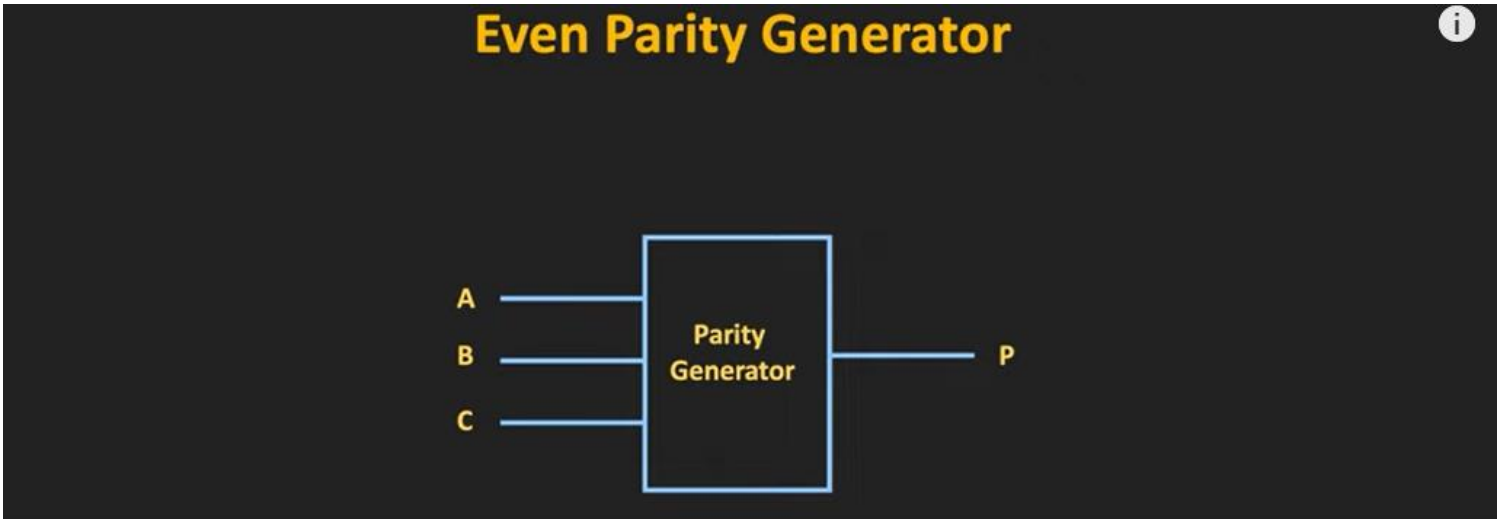
No E-Mail submissions will be accepted.
Submission formats and file naming:
File name : Pts_firstName_lastName_lab_7
File format: pdf or MS Word format
e.g. Pts_Donald_Trump_lab_7.pdf

Reading materials

Use the following link and write a one page summary about the movie.

Parity Generator and Parity Checker Explained

https://youtu.be/c8qAti1zBVQ



1) The word “Covid19” is given.
(a) Represent in an 8-bit ASCII code.
(b) Add even parity bit to each character (from left side) and represent each character in hex.

	ASCII (Hex)	Parity bit + Binary	Parity bit + Binary in Hex
C	43	101000011	143
o	6F	001101111	06F
v	76	101110110	176
i	69	001101001	069
d	64	101100100	164
1	31	100110001	131
9	39	000111001	039

2) Use the given formula below to obtain the 7-bit Hamming code word for the following 4-bit data words:

Data word	= abcd	x = a⊕b⊕d
Parity bits	= xyz	y = a⊕c⊕d
Codeword	= xyazbcd	z = b⊕c⊕d

a) 1010
b) 1100
c) 1110

1010
1011010

1100
0111100

1110
0010110

3) Which of the following 7-bit Hamming codes is corrupted?

a) 1011011
b) 0011001
c) 1010000

1011
1011010 ⊗

1001
0011001 ✓

1000
1110000 ⊗

4) Obtain the 12-bit Hamming code word for the following 8-bit data word.

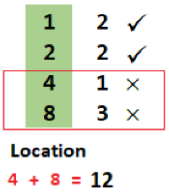
11011011

11011011
111110111011

5) The following string of hex digits encodes extended ASCII characters in an even parity Hamming code: 0D3 DD3 0F2 5C1 1C5 CE3. Decode this string and write down the characters that are encoded (**8 data bits + 4 check bits = 12 bits**).

e.g. **49C**

01001001110**0** ⇒ 0100100111**01** ⇒ 01001101 0x4D (77) ⇒ M



Encoded(hex)	**49C**
Word	01001101
Location of corrupted bit	12
ASCII Character	M

Encoded(hex)	**0D3**	**DD3**	**0F2**	**5C1**	**1C5**	**CE3**
Word	**01100010**	**01100001**	**01100010**	**01101001**	**01100101**	**01110011**
Location of corrupted bit	**12**	**11**	**7**	**9**	**1**	**N/A**
ASCII Character	b	a	b	i	e	s

0D3 000011010011

DD3 110111010011

0F2 000011110010

5C1 010111000001

1C5 000111000101

CE3 110011100011

6) Encode the data bit sequence 100110000 using the generator 1101 and give the codeword.

```
100110000000
1101
----
 10010000000
 1101
 ----
  1000000000
  1101
  ----
   101000000
   1101
   ----
    11100000
```

```
    1101
    ----
     0110000
     0000
     ----
      110000
      1101
      ----
       00100
       0000
       ----
        0100
        0000
        ----
         100
Transmitted value is:   100110000100
```

8 bits:
Example: A (0x41) = 01000001

Hex	Value	Hex	Value	Hex	Value	Hex	Value	Hex	Value	Hex	Value	Hex	Value	Hex	Value
00	NUL	10	DLE	20	SP	30	0	40	@	50	P	60	`	70	p
01	SOH	11	DC1	21	!	31	1	41	A	51	Q	61	a	71	q
02	STX	12	DC2	22	"	32	2	42	B	52	R	62	b	72	r
03	ETX	13	DC3	23	#	33	3	43	C	53	S	63	c	73	s
04	EOT	14	DC4	24	$	34	4	44	D	54	T	64	d	74	t
05	ENQ	15	NAK	25	%	35	5	45	E	55	U	65	e	75	u
06	ACK	16	SYN	26	&	36	6	46	F	56	V	66	f	76	v
07	BEL	17	ETB	27	'	37	7	47	G	57	W	67	g	77	w
08	BS	18	CAN	28	(	38	8	48	H	58	X	68	h	78	x
09	HT	19	EM	29	)	39	9	49	I	59	Y	69	i	79	y
0A	LF	1A	SUB	2A	*	3A	:	4A	J	5A	Z	6A	j	7A	z
0B	VT	1B	ESC	2B	+	3B	;	4B	K	5B	[	6B	k	7B	{
0C	FF	1C	FS	2C	,	3C	<	4C	L	5C	\	6C	l	7C	|
0D	CR	1D	GS	2D	-	3D	=	4D	M	5D	]	6D	m	7D	}
0E	SO	1E	RS	2E	.	3E	>	4E	N	5E	^	6E	n	7E	~
0F	SI	1F	US	2F	/	3F	?	4F	O	5F	_	6F	o	7F	DEL