

Binary to Gray Code conversion

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BINARY TO GRAY CODE CONVERSION

AIM

To write an assembly language program to convert Binary code in to gray code

ASSEMBLY LANGUAGE PROGRAM

```

C600 LXI H C700 21 ; Initialize the HL register pair
C601             00 ;
C602             C7 ;
C603 MOV A M    7E ; Move the content of memory to accumulator
C604 MOV D A    57 ; Move accumulator content in to D register
C605 RAR        1F ; Rotate accumulator right
C606 XRA D      AA ; Exclusive OR the content of D register
C607 INX H      23 ; Increment the HL register pair
C608 MOV M A    77 ; Move the accumulator content to memory
C609 HLT        76 ; Halt the execution
  
```

EXECUTION - 1

```

C700 65 ; Binary number(Input data)
C701 57 ; Gray number(Output data)
  
```

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C600	21	LXI H C700	00	00	00	00	00	C7	00	0000	0000 0000
C603	7E	MOV A M	65	00	00	00	00	C7	00	0000	0000 0000
C604	57	MOV D A	65	00	00	65	00	C7	00	0000	0000 0000
C605	1F	RAR	32	00	00	65	00	C7	00	0000	0000 0001
C606	AA	XRA D	57	00	00	65	00	C7	00	0000	0000 0000
C607	23	INX H	57	00	00	65	00	C7	01	0000	0000 0000
C608	77	MOV M A	57	00	00	65	00	C7	01	0000	0000 0000
C609	76	HLT	57	00	00	65	00	C7	01	0000	0000 0000

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
0	0	0	0	0	0	0	0

EXECUTION - 2

```

C700 72 ; Binary number(Input data)
C701 4B ; Gray number(Output data)
  
```

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C600	21	LXI H C700	00	00	00	00	00	C7	00	0000	0000 0000
C603	7E	MOV A M	72	00	00	00	00	C7	00	0000	0000 0000
C604	57	MOV D A	72	00	00	72	00	C7	00	0000	0000 0000
C605	1F	RAR	39	00	00	72	00	C7	00	0000	0000 0000
C606	AA	XRA D	4B	00	00	72	00	C7	00	0000	0000 0100
C607	23	INX H	4B	00	00	72	00	C7	01	0000	0000 0100
C608	77	MOV M A	4B	00	00	72	00	C7	01	0000	0000 0100
C609	76	HLT	4B	00	00	72	00	C7	01	0000	0000 0100

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
0	0	0	0	0	1	0	0

EXECUTION - 3

C700 AB ; Binary number(Input data)
 C701 FE ; Gray number(Output data)

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C600	21	LXI H C700	00	00	00	00	00	C7	00	0000	0000 0000
C603	7E	MOV A M	AB	00	00	00	00	C7	00	0000	0000 0000
C604	57	MOV D A	AB	00	00	AB	00	C7	00	0000	0000 0000
C605	1F	RAR	55	00	00	AB	00	C7	00	0000	0000 0001
C606	AA	XRA D	FE	00	00	AB	00	C7	00	0000	1000 0000
C607	23	INX H	FE	00	00	AB	00	C7	01	0000	1000 0000
C608	77	MOV M A	FE	00	00	AB	00	C7	01	0000	1000 0000
C609	76	HLT	FE	00	00	AB	00	C7	01	0000	1000 0000

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
1	0	0	0	0	0	0	0

EXECUTION - 4

C700 FF ; Binary number(Input data)
 C701 80 ; Gray number(Output data)

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C600	21	LXI H C700	00	00	00	00	00	C7	00	0000	0000 0000
C603	7E	MOV A M	FF	00	00	00	00	C7	00	0000	0000 0000
C604	57	MOV D A	FF	00	00	FF	00	C7	00	0000	0000 0000
C605	1F	RAR	7F	00	00	FF	00	C7	00	0000	0000 0001
C606	AA	XRA D	80	00	00	FF	00	C7	00	0000	1000 0000
C607	23	INX H	80	00	00	FF	00	C7	01	0000	1000 0000
C608	77	MOV M A	80	00	00	FF	00	C7	01	0000	1000 0000
C609	76	HLT	80	00	00	FF	00	C7	01	0000	1000 0000

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
1	0	0	0	0	0	0	0

EXECUTION - 5

C700 D2 ; Binary number(Input data)

C701 BB ; Gray number(Output data)

PROGRAM TRACE

Addr	MC	Mnemonic	A	B	C	D	E	H	L	SP	Flag Word
			00	00	00	00	00	00	00	0000	0000 0000
C600	21	LXI H C700	00	00	00	00	00	C7	00	0000	0000 0000
C603	7E	MOV A M	D2	00	00	00	00	C7	00	0000	0000 0000
C604	57	MOV D A	D2	00	00	D2	00	C7	00	0000	0000 0000
C605	1F	RAR	69	00	00	D2	00	C7	00	0000	0000 0000
C606	AA	XRA D	BB	00	00	D2	00	C7	00	0000	1000 0100
C607	23	INX H	BB	00	00	D2	00	C7	01	0000	1000 0100
C608	77	MOV M A	BB	00	00	D2	00	C7	01	0000	1000 0100
C609	76	HLT	BB	00	00	D2	00	C7	01	0000	1000 0100

FLAG WORD

S	Z	x	Ac	x	P	x	Cy
1	0	0	0	0	1	0	0

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