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#include<stdio.h>

#include<conio.h>

void addOperation(char [],char [],char [],char,char \*);

void andOperation(char[],char[],char[]);

void orOperation(char[],char[],char[]);

void ones\_complement(char []);

void main()

{

char a[5],b[5],c[5],carry\_in,carry\_out;

int mode,operation;

clrscr();

printf("Welcome to ALU : \n");

printf("Enter first 4-bit number : ");

gets(a);

printf("Enter second4-bit number : ");

gets(b);

printf("Enter carry in : ");

scanf("%c",&carry\_in);

printf("\nSelect mode : \n0.Arithmetic\n1.Logical\nMode : ");

scanf("%d",&mode);

switch(mode)

{

case 0:

{

printf("\nSelect Operation : \n00.A+B\n01.A-1\n10.A-B\n11.B+1\n");

printf("Operation : ");

scanf("%d",&operation);

printf("\nOutput:\n");

switch(operation)

{

case 0:

addOperation(a,b,c,carry\_in,&carry\_out);

printf("Sum : %s\tCarry : %c",c,carry\_out);

break;

case 1:

addOperation(a,"1111",c,'0',&carry\_out);

printf("Sum : %s\tCarry : %c",c,carry\_out);

break;

case 10:

ones\_complement(b);

addOperation(b,"0001",c,'0',&carry\_out);

addOperation(a,c,b,'0',&carry\_out);

printf("Sum : %s\tCarry : %c",c,carry\_out);

break;

case 11:

addOperation(b,"0001",c,'0',&carry\_out);

printf("Sum : %s\tCarry : %c",c,carry\_out);

break;

default:

printf("Invalid Choice !!");

}

}

break;

case 1:

{

printf("\nSelect Operation : \n00.A&B\n01.A|B\n10.1's comp.(A)&B\n11.1's comp.(A)\n");

printf("Operation : ");

scanf("%d",&operation);

printf("\nOutput : \n");

switch(operation)

{

case 0:

andOperation(a,b,c);

puts(c);

break;

case 1:

orOperation(a,b,c);

puts(c);

break;

case 10:

ones\_complement(a);

andOperation(a,b,c);

puts(c);

break;

case 11:

ones\_complement(a);

puts(a);

break;

default:

printf("Invalid Choice !!");

}

}

break;

default:

printf("Invalid Choice!!");

}

getch();

}

void addOperation(char a[],char b[],char c[],char carry\_in,char \*carry\_out)

{

char temp=carry\_in;

int i=4;

c[i]='\0'; //end string

for(i=3;i>=0;i--)

{

c[i]=(a[i]+b[i]+temp-3\*'0')%2+'0';

temp=(a[i]+b[i]+temp-3\*'0')/2+'0';

}

\*carry\_out=temp;

}

void andOperation(char a[],char b[],char c[])

{

int i=4;

c[i]='\0'; //end string

for(i=3;i>=0;i--)

{

c[i]=(a[i])&(b[i]);

}

}

void orOperation(char a[],char b[],char c[])

{

int i=4;

c[i]='\0'; //end string

for(i=3;i>=0;i--)

{

c[i]=(a[i])|(b[i]);

}

}

void ones\_complement(char a[])

{

int i;

for(i=3;i>=0;i--)

{

if(a[i]=='0')

a[i]='1';

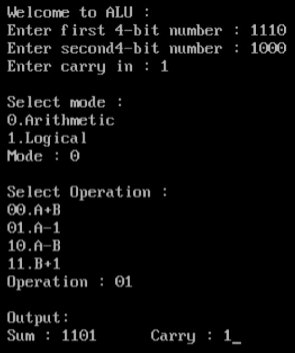
else

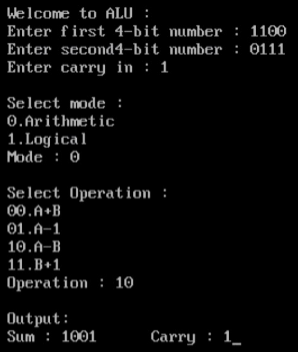
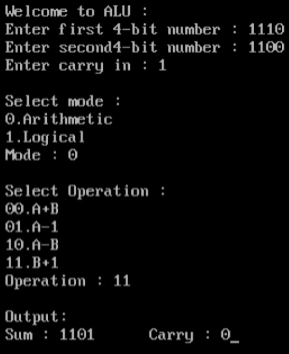
a[i]='0';

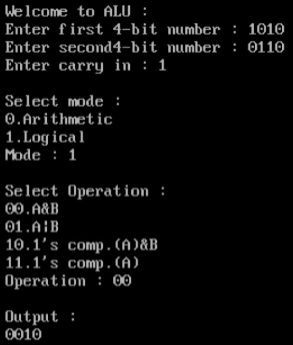
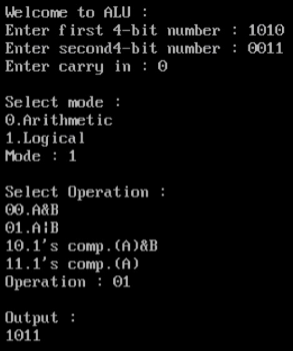
}

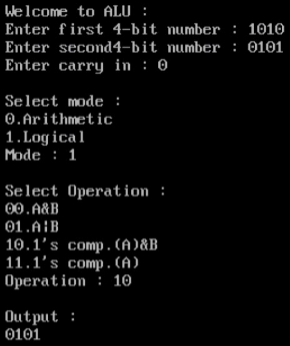
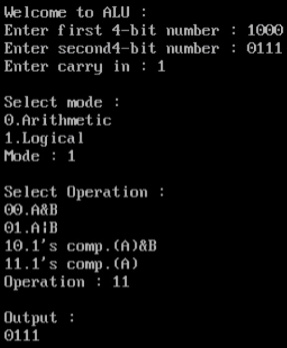
}

/\*OUTPUT :

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