Experiment No. 8
1mplement Restoring algorithm using c- programing
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Date of Submission:

Aim: To implement Restoring division algorithm using c-programming.

Objective - 1. To understand the working of Restoring division algorithm.
2. To understand how to implement Restoring division algorithm using c-programming.

Theory:
l) The divisor is placed in M register, the dividend placed in Q register. 2) At every step, the A and Q registers together are shifted to the left by I-bit

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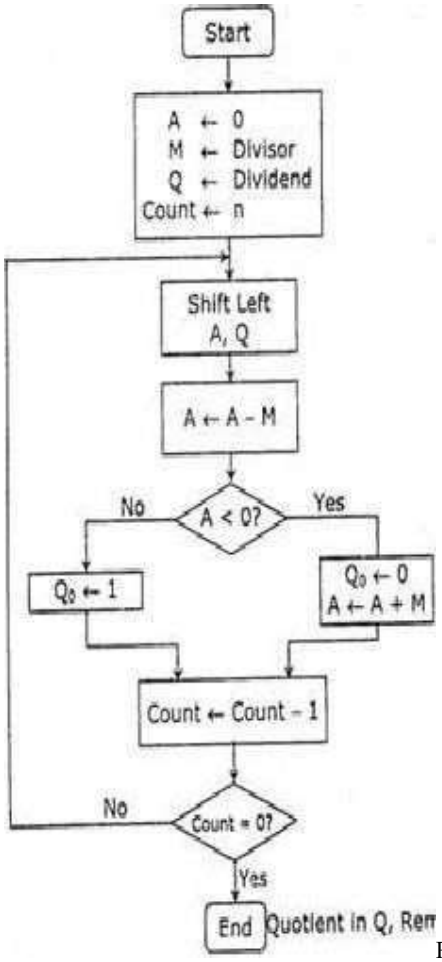
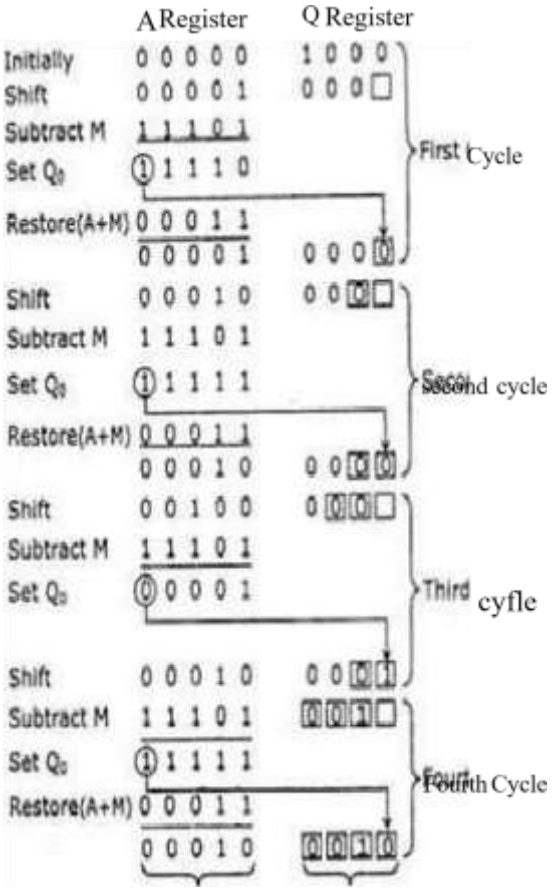
3) M is subtracted from A to determine whether A divides the partial remainder. If it does, then QC) set to I-bit. Otherwise, QO gets a 0 bit and M must be added back to A to restore the previous value.

4) The count is then decremented and the process continues for n Steps. At the end, the quotient is in the Q register and the remainder is in the A register.

Flowchart

Perform • 3 by restoring division technique,





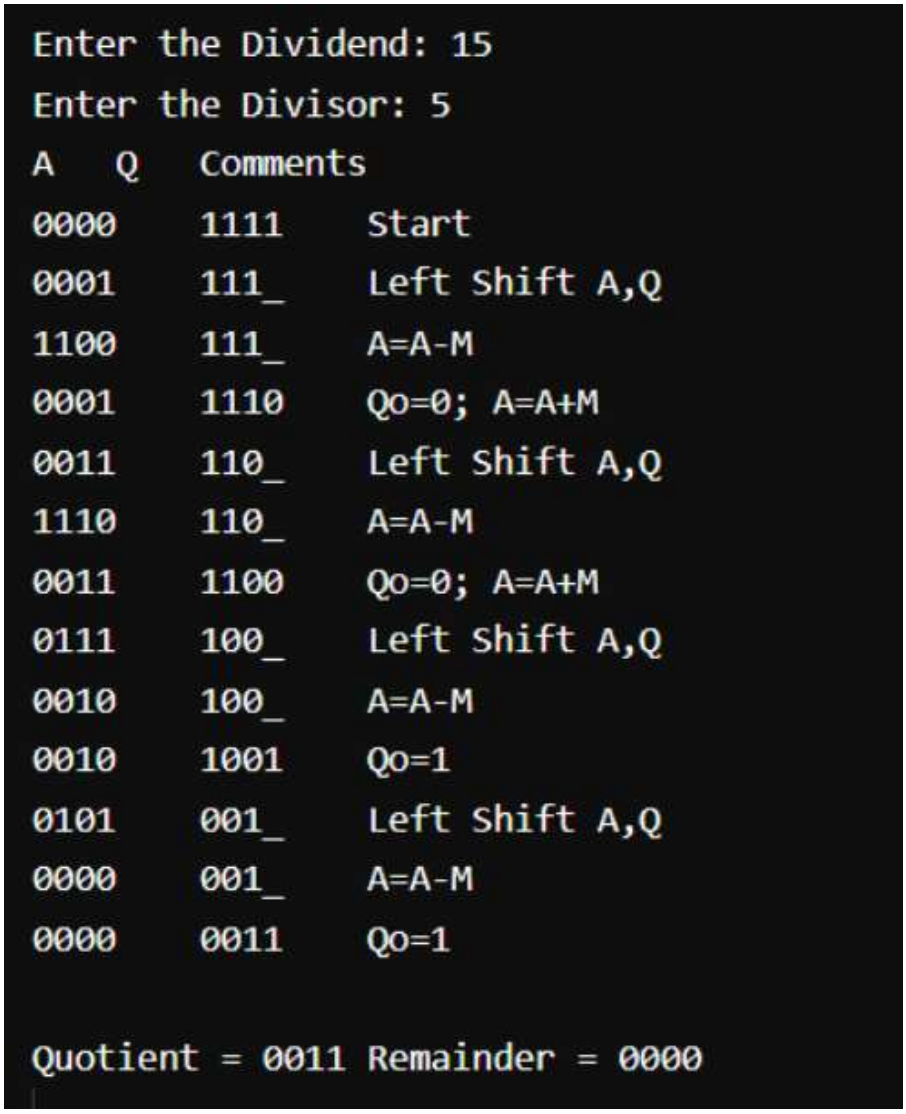

```
Program #include<stdlib.h>
#include<stdio.h>
int
acum[100]={0};
void add(int acum[],int b[],int n);  int
q[100],b[100];
 int main()
 {
   int x,y;
    printf("Enter the Number :");
     scanf("%d%d", &x,&y);
```

```
    int i=0;
while(x>0||y>0)
    {
if(x>0)
        {
         q[i]=x%2;
x=x/2;
         }
else            {
q[i]=0;
}
          If(y>0)
          {
           b[i]=y%2;
            y=y/2;
            }
else             {
b[i]=0;
}              i++;
            }

int n=i;
int  bc[50];
printf("\n");
for(i=0;i<n;i++)
  {
   if(b[i]==0)
   {
     bc[i]=1;
    }
else
     {
      bc[i]=0;
       }
}
         bc[n]=1;
for(i=0;i<=n;i++)
         {
         if(bc[i]==0)
           {
bc[i]=1;
i=n+2;
}
else
 {
  bc[i]=0;
  }  }     int l;
b[n]=0;      int
```

```
k=n;     int
n1=n+n-1;
int j,mi=n-1;
   for(i=n;i!=0;i--)
   {
     for(j=n;j>0;j--)
     {
      acum[j]=acum[j-1];
     }
      acum[0]=q[n-1];
      for(j=n-1;j>0;j--)
      {
       q[j]=q[j-1];
      }
      add(acum,bc,n+1);
      If(acum[n]==1)
       {
         q[0]=0;
add(acum,b,n+1);
       }
else
       {
q[0]=1;
        }
      }
       printf("\nQuoient   : ");

        for(  l=n1;l>=0;l--)
        {
          printf("%d",q[l]);
        }
          printf("\nRemainder : ");
          for( l=n;l>=0;l--)
         {
          printf("%d",acu m[l]);
          }
           return 0;
        }
    void add(int acum[],int bo[],int n)
    {
      int
     i=0,temp=0,sum =0;
     for(i=0;i<n;i++)
      {
         sum=0;
         sum=acum[i]+b o[i]+temp;
         if(sum==0)
         {
```

```
            acum[i]=0;
temp=0;
           }
            else
if (sum==2)
               {
                acum[i]=0;
temp=1;
               }
else
if(sum==1)
                {
                 acum[i]=1;
                 temp=0;
                }
else
                if(sum==3)
                 {
                  acum[i]=1;
                  temp=1;
                 }
       }
}
```

Output-



Conclusion - The aim of the experiment is to implement the Restoring division algorithm in C programming, a method for efficiently performing division by restoring partial remainders and quotients, aiming to optimize the division process and achieve accurate results in a systematic manner.