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Course: CSL5403

1 Write a code for parity check.

```
#include<bits/stdc++.h>
# define bool int
using namespace std;

// Function to get parity of number n. It returns 1
// if n has odd parity, and returns 0 if n has even
// parity
bool getParity(unsigned int n)
{
    bool parity = 0;
    while (n)
    {
        parity = !parity;
        n      = n & (n - 1);
    }
    return parity;
}

/* Driver program to test getParity() */
int main()
{
    unsigned int n;
    cout<<"Enter Number : ";
    cin>>n;
    cout<<"Parity of no "<<n<<" = "<<(getParity(n)? "odd": "even");

    getchar();
    return 0;
}
```

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OUTPUT:

```
-----  
E:\CP-Code>"e:\CP-Code\main.exe"  
Enter Number : 11  
Parity of no 11 = odd  
E:\CP-Code>"e:\CP-Code\main.exe"  
Enter Number : 12  
Parity of no 12 = even  
E:\CP-Code>█
```

2. Write a code for checksum.

```
#include<iostream>  
#include<string.h>  
  
using namespace std;  
  
int main()  
{  
    char a[20],b[20];  
    char sum[20],complement[20];  
    int i;  
  
    cout<<"Enter first binary string\n";  
    cin>>a;  
    cout<<"Enter second binary string\n";  
    cin>>b;  
  
    if(strlen(a)==strlen(b))  
    {  
        char carry='0';  
        int length=strlen(a);
```

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```
for(i=length-1;i>=0;i--)
{
    if(a[i]=='0' && b[i]=='0' && carry=='0')
    {
        sum[i]='0';
        carry='0';
    }
    else if(a[i]=='0' && b[i]=='0' && carry=='1')
    {
        sum[i]='1';
        carry='0';
    }
    else if(a[i]=='0' && b[i]=='1' && carry=='0')
    {
        sum[i]='1';
        carry='0';
    }
    else if(a[i]=='0' && b[i]=='1' && carry=='1')
    {
        sum[i]='0';
        carry='1';
    }
    else if(a[i]=='1' && b[i]=='0' && carry=='0')
    {
        sum[i]='1';
        carry='0';
    }
    else if(a[i]=='1' && b[i]=='0' && carry=='1')
```

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```
{
    sum[i]='0';
    carry='1';

}
else if(a[i]=='1' && b[i]=='1' && carry=='0')
{
    sum[i]='0';
    carry='1';

}
else if(a[i]=='1' && b[i]=='1' && carry=='1')
{
    sum[i]='1';
    carry='1';

}
else
    break;
}
cout<<"\nSum="<<carry<<sum;

for(i=0;i<length;i++)
{
    if(sum[i]=='0')
        complement[i]='1';
    else
        complement[i]='0';
}

if(carry=='1')
    carry='0';
```

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```
        else
            carry='1';

        cout<<"\nChecksum="<<carry<<complement;
    }
    else
        cout<<"\nWrong input strings";

    return 0;
}
```

OUTPUT :

```
E:\CP-Code>"e:\CP-Code\main.exe"
Enter first binary string
101101
Enter second binary string
110010

Sum=1011111
Checksum=0100000
E:\CP-Code>|
```

3. Write a code for Cyclic Redundancy check (CRC).

```
#include<iostream>
using namespace std;
void division(int temp[],int gen[],int n,int r)
{
    for(int i=0;i<n;i++)
    {
        if (gen[0]==temp[i])
        {
```

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```
        for(int j=0,k=i;j<r+1;j++,k++)
            if(!(temp[k]^gen[j]))
                temp[k]=0;
            else
                temp[k]=1;
    } }}
int main()
{int n,r,message[50],gen[50],temp[50];
  cout<<"At Sender's End "<<endl;
  cout<<"Enter the number of message bits : ";
  cin>>n;
  cout<<"Enter the number of generator bits : ";
  cin>>r;
  cout<<"Enter the message : ";
  for(int i=0;i<n;i++)
      cin>>message[i];
  cout<<"Enter the generator : ";
  for(int i=0;i<r;i++)
      cin>>gen[i];
  r--;
  for(int i=0;i<r;i++)
      message[n+i] = 0;
  for(int i=0;i<n+r;i++)
      temp[i] = message[i];
  division(temp,gen,n,r);
  cout<<"CRC : ";
  for(int i=0;i<r;i++)
  {
      cout<<temp[n+i]<<" ";
      message[n+i] = temp[n+i];
  }
  cout<<endl<<"Transmitted Message : ";
```

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```
for(int i=0;i<n+r;i++)
    cout<<message[i]<<" ";
cout<<endl<<endl<<"At Receiver's End "<<endl;
cout<<"Enter the received message : ";
for(int i=0;i<n+r;i++)
    cin>>message[i];
for(int i=0;i<n+r;i++)
    temp[i] = message[i];
division(temp,gen,n,r);
for(int i=0;i<r;i++)
{
    if(temp[n+i])
    {
        cout<<"Error detected in received message.";
        return 0;
    }
}
cout<<"No error in received Message.\nReceived Message : ";
for(int i=0;i<n;i++)
    cout<<message[i]<<" ";
return 0;
}
```

OUTPUT :

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```
E:\CP-Code>"e:\CP-Code\main.exe"
At Sender's End
Enter the number of message bits : 10
Enter the number of generator bits : 5
Enter the message : 1 1 0 1 0 1 1 1 1 1
Enter the generator : 1 0 0 1 1
CRC : 0 0 1 0
Transmitted Message : 1 1 0 1 0 1 1 1 1 1 0 0 1 0

At Receiver's End
Enter the received message : 1 1 0 1 0 1 1 1 1 0 0 0 1 0
Error detected in received message.
E:\CP-Code>"e:\CP-Code\main.exe"
At Sender's End
Enter the number of message bits : 10
Enter the number of generator bits : 5
Enter the message : 1 1 0 1 0 1 1 1 1 1
Enter the generator : 1 0 0 1 1
CRC : 0 0 1 0
Transmitted Message : 1 1 0 1 0 1 1 1 1 1 0 0 1 0

At Receiver's End
Enter the received message : 1 1 0 1 0 1 1 1 1 1 0 0 1 0
No error in received Message.
Received Message : 1 1 0 1 0 1 1 1 1 1
E:\CP-Code>
```