Networking Lab
(PCC-CS-692)

Assignment for Checksum

1. **Write a C code to encode a user provided dataword using checksum procedure.**

Input:

Dataword: 11001100101010101111000011000011
Segment Length = 8

Output:

Checksum: 11010011
code word : 11001100101010101111000011000011111010011

```
#include <stdio.h>
#include <string.h>
#include <math.h>


int main() {

// **************START  CODE FOR CHKSUM SENDER ************//
char data[100],data1[100];
int t,c,k,dl,sl,i,j=0,sum[100];
printf("\n enter the data \n");
scanf("%s",data);
dl=strlen(data);


//*** this done to mandet seglen must in pow of 2***********
while(1){
printf("\n enter the segment length \n");
scanf("%d",&sl);
for(i=1;i<=sl/2;i++)
        {
                if(pow(2,i)==sl)
                {
                        j=1;
                        break;
                }
        }
        if(j==1)
                break;
        else
                printf("\n segment length must in pow of 2\n");
}
```

```
//*****************************************************************

//if data length not divisable by segl adding 0 at front of data
if((dl%sl)!=0)
{
i=sl-(dl%sl);
for(j=0;j<i;j++)
        data1[j]='0';
strcat(data1,data);
strcpy(data,data1);
dl=dl+i;
}
//  ************

for(i=0;i<sl;i++)
sum[i]=0;

for(i=dl;i>0;i=i-sl)
{
        c=0;
        k=sl-1;
        for(j=i-1;j>=i-sl;j--)
        {
                t=(sum[k]+(data[j]-48)+c);
                sum[k]=t%2;
                c=t/2;
                k--;
        }
        if(c==1)
        {
                for(j=sl-1;j>=0;j--)
                {
                        t=sum[j]+c;
                        sum[j]=t%2;
                        c=t/2;
                }
        }
}
printf("\n Checksum = ");
for(i=0;i<sl;i++){
        if(sum[i]==0)
                sum[i]=1;
        else
                sum[i]=0;
        printf("%d",sum[i]);
        data[dl+i]=sum[i]+48;

        }
        data[dl+i]='\0';

printf("\ncode word is: %s",data);
```

```
// **************END CODE FOR CHKSUM SENDER ************//

return(0);
}
```

2. Write a C code to decode a user provided codeword using Checksum procedure. Provide the output along with original data (good/bad).

Input:

Codeword: 1100110010101010111100001100001111010011
Segment length: 8

Output:

```
Data recv ok
ACTUAL data IS: 1 1 0 0 1 1 0 0 1 0 1 0 1 0 1 0 1 1 1 1 0 0 0 0 1 1 0 0 0 0 1 1
```

```
#include  <stdio.h>
#include  <math.h>
#include <string.h>

int main() {
  char data[100];
  int dl,j,k,c,sum[100],t,sl,i;
  printf("\n enter codeword:\n");
  scanf("%s",data);
  dl=strlen(data);

  //*** this done to mandet seglen must in pow of 2**********
  while(1){
  printf("\n entr the segment length \n");
  scanf("%d",&sl);
  for(i=1;i<=sl;i++)
          {
                  if(pow(2,i)==sl)
                  {
                          j=1;
                          break;
                  }
          }
          if(j==1)
                  break;
          else
                  printf("\n segment length must in pow of 2\n");
  }
//************************************************************

for(i=0;i<sl;i++)
  sum[i]=0;

  for(i=dl;i>0;i=i-sl)
  {
```

```
            c=0;
            k=sl-1;
            for(j=i-1;j>=i-sl;j--)
            {
                        t=(sum[k]+(data[j]-48)+c);
                        sum[k]=t%2;
                        c=t/2;
                        k--;

            }
            if(c==1)
            {
                        for(j=sl-1;j>=0;j--)
                        {
                                    t=sum[j]+c;
                                    sum[j]=t%2;
                                    c=t/2;
                        }
            }
  }
  j=0;
  for(i=0;i<sl;i++){
            if(sum[i]!=1){
                        j++;break;}
            }

  if(j==0)
            {
                        printf("\n data recv ok \n");
                        printf("\n ACTUAL data IS:  \n");
                        for(i=0;i<dl-sl;i++)
                        printf("%c ",data[i]);
            }
  else
            {
                        printf("\n data recv wrong \n");
            }

return(0);
}
```