OST EXPERIMENT 6

AIM:

A) FIND OUT THE HAMMING DISTANCE BETWEEN TWO CODEWORDS.

B) TO PLAY SA RE GA MA PA DHA NI SA IN SCILAB .

PART - A

THEORY: In information theory, the Hamming distance between two strings of equal length is the number of positions at which the corresponding symbols are different. In other words, it measures the minimum number of *substitutions* required to change one string into the other, or the minimum number of *errors* that could have transformed one string into the other. In a more general context, the Hamming distance is one of several string metrics for measuring the edit distance between two sequences. A major application is in coding theory, more specifically to block codes, in which the equal-length strings are vectors over a finite field.

CODE:

```
clc;

clear all;

N=10;

a= input('enter sequence 1-');

b= input('enter sequence 2-');

c=0;

for i = 1:length(a)
    if a(i)~=b(i) then
      c=c+1;
end
end
disp(sprintf("Hamming distance = %d",c));
```

OUTPUT:

```
enter sequence 1-[1 0 1 0 1 0 1 0 1 0]

enter sequence 2-[1 1 0 1 0 1 0 1 1 0]

 Hamming distance = 7
```

OST EXPERIMENT 6

PART - B

THEORY: The musical raag SA RE GA MA PA DHA NI SA and its reverse order has been demonstrated using scilab software. Firstly the frequencies of each raag is written in an array form. Then the time interval is defined over which the above raag will be played. The sampling frequency is 8000 Hz. In a “for” loop the sine function is written which plays each of the frequency and the sound is produced. The “for” loop limits are then reversed for obtaining the reverse order of the raag.

CODE:

```
clc;
clear all;
f=[240 254 302 320 358.5 380 451 470];
t=1:4000;
te=[];
 pi=3.14;
fs=8000;
for i= 1:length(f)
   y=sin(2*pi*(f(i)/fs)*t);
   te=[te y];
end
sound(te,fs);
 for i= length(f):-1:1
       y=sin(2*pi*(f(i)/fs)*t);
   te=[te y];
end
sound(te,fs);
```