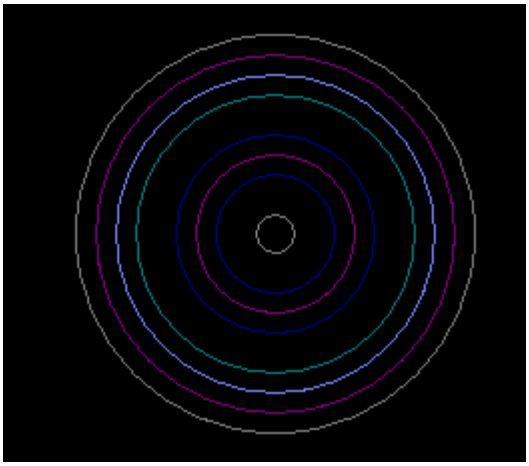
ANIMATION OF A CIRCLE USING C++ GRAPHICS

SOURCE CODE:

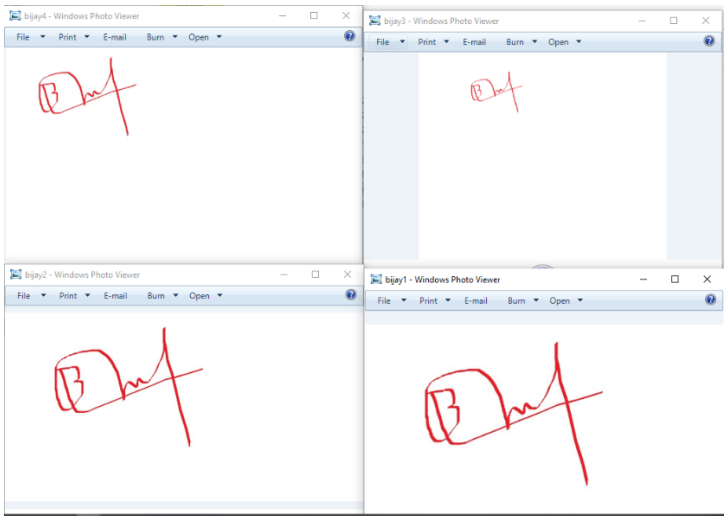
```
#include<graphics.h>
#include<iostream>
#include<stdlib.h>
#include<iomanip>
#define n 10
void draw(int cx, int cy, int r)
{
inti,gap=0;
for(i=0;i<n;i++)
      {
setcolor(rand()%10);
circle(cx,cy,r+gap);
gap+=10;
      }
delay(100);
cleardevice();
}
int main()
{
intgdriver=DETECT,gmode;
initgraph(&gdriver, &gmode, "");
int cx=300,cy=200,r=10;
while(1)
  {
draw(cx,cy,r);
  }
getch();
closegraph();
}
```

OUTPUT:

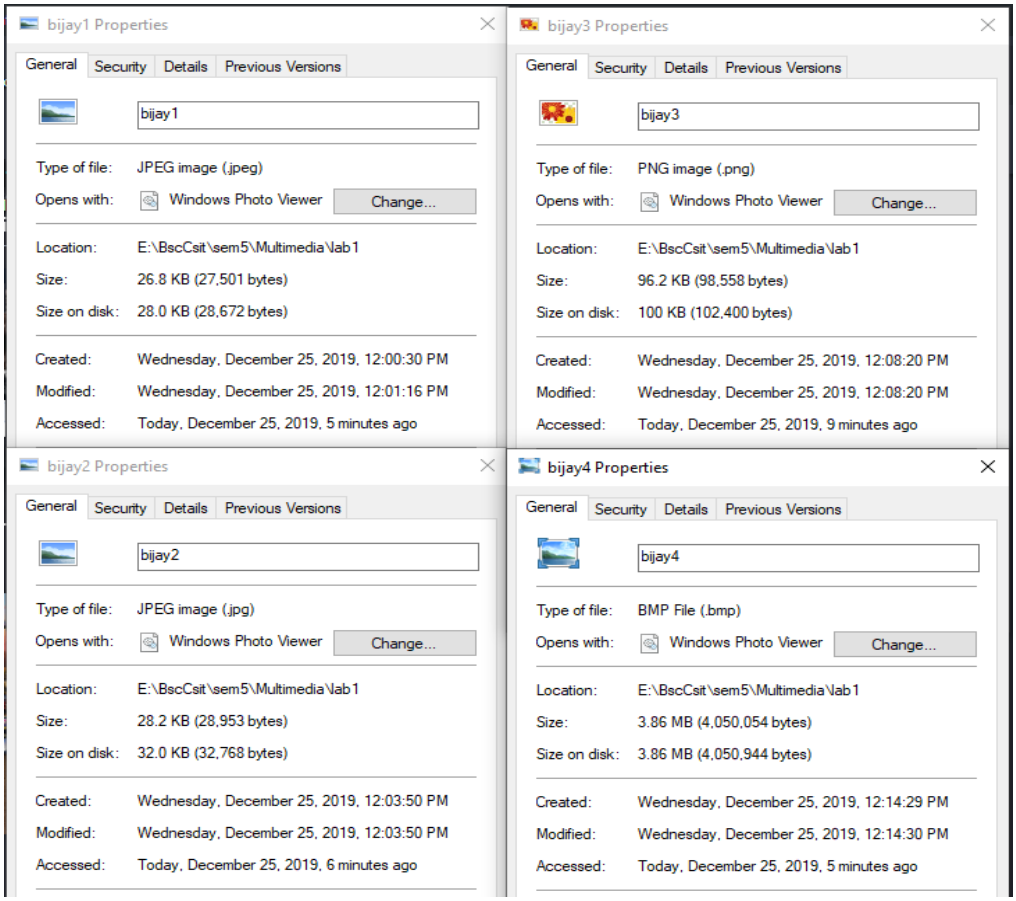


COMPARE DIFFERENT PROPERTIES OF DIGITAL SIGNATURE ON DIFFERENT FILE FORMAT.

DIGITAL SIGNATURE:



PROPERTIES ON DIFFERENT FILE FORMAT:



WRITE A PROGRAM TO IMPLEMENT RUN-LENGTH CODING.

SOURCE CODE

```
#include <bits/stdc++.h>
using namespace std;
int printRLE(string str)
{
   int n = str.length(),count2=0;
   for (int i = 0; i < n; i++)
   {
      int count = 1;
      while (i < n - 1 && str[i] == str[i + 1]) {
         count++;
         i++;
      }
      cout << str[i]<< count;
      count2=count2+2;
   }
   return count2;
}

int main()
{
   int a,i,p;
   string str;
   cout<<"Enter the string:";
   cin>>str;
   i=str.length();
   cout<<"\nLength before compression:"<<i;
   cout<<"\n\n";
   a=printRLE(str);
   cout<<"\n\nLength after compression:"<<a;
   cout<<"\n";
   return 0;
}
```

Output:

"E:\5th sem\Multimedia computing\lab\runlenghtcoding.exe"

```
Enter the string:aaaaaabcdeeefggggg

Length before compression:18

a6b1c1d1e3f1g5

Length after compression:14

Process returned 0 (0x0)   execution time : 14.447 s
Press any key to continue.
```

WRITE A PROGRAM TO IMPLEMENT HUFFMAN CODING.

SOURCE CODE:

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

typedef struct node_t {
struct node_t *left, *right;
int freq;
char c;
} *node;

struct node_t pool[256] = {{0}};
node qqq[255], *q = qqq - 1;
int n_nodes = 0, qend = 1;
char *code[128] = {0}, buf[1024];

node new_node(int freq, char c, node a, node b)
{
node n = pool + n_nodes++;
if (freq) n->c = c, n->freq = freq;
else {
n->left = a, n->right = b;
n->freq = a->freq + b->freq;
}
return n;
}

/* priority queue */
void qinsert(node n)
{
int j, i = qend++;
while ((j = i / 2)) {
if (q[j]->freq <= n->freq) break;
q[i] = q[j], i = j;
}
q[i] = n;
}

node qremove()
{
int i, l;
node n = q[i = 1];

if (qend < 2) return 0;
qend--;
while ((l = i * 2) < qend) {
if (l + 1 < qend && q[l + 1]->freq < q[l]->freq) l++;
		q[i] = q[l], i = l;
	}
	q[i] = q[qend];
	return n;
}

/* walk the tree and put 0s and 1s */
void build_code(node n, char *s, int len)
{
	static char *out = buf;
	if (n->c) {
		s[len] = 0;
		strcpy(out, s);
		code[n->c] = out;
		out += len + 1;
		return;
	}

	s[len] = '0'; build_code(n->left,  s, len + 1);
	s[len] = '1'; build_code(n->right, s, len + 1);
}

void init(const char *s)
{
	int i, freq[128] = {0};
	char c[16];

	while (*s) freq[(int)*s++]++;

	for (i = 0; i < 128; i++)
		if (freq[i]) qinsert(new_node(freq[i], i, 0, 0));

	while (qend > 2)
		qinsert(new_node(0, 0, qremove(),
qremove()));

	build_code(q[1], c, 0);
}

void encode(const char *s, char *out)
{
	while (*s) {
		strcpy(out, code[*s]);
		out += strlen(code[*s++]);
	}
}
```

```
void decode(const char *s, node t)
{
	node n = t;
	while (*s) {
		if (*s++ == '0') n = n->left;
		else n = n->right;

		if (n->c) putchar(n->c), n = t;
	}

	putchar('\n');
	if (t != n) printf("garbage input\n");
}
#define n 1000000
int main()
{
	int i,a,b,a1;
   char st[n];
	char *str=st;
	printf("\nEnter message:");
	scanf("%[^\n]s",st);

      char buf[1024];

	a=strlen(st);
	printf("\nTotal message length: %d\n",a);
	a1=a*8;
	printf("So, total bits before compressing is %d*8: %d bits.\n\n",a,a1);

	printf("\nBits given for each character for compressing the given message:\n");
	init(str);
	for (i = 0; i < 128; i++)
		if (code[i])
         printf("'%c': %s\n", i, code[i]);

	encode(str, buf);
	b=strlen(buf);
	printf("\n\tEncoded/compressed message:%s\n",buf);
	printf("\n\tTotal bits after compressing: %d bits.\n",b);

	printf("\n\tDecoded/uncompressed/original message:");
	decode(buf, q[1]);

	return 0;
}
```

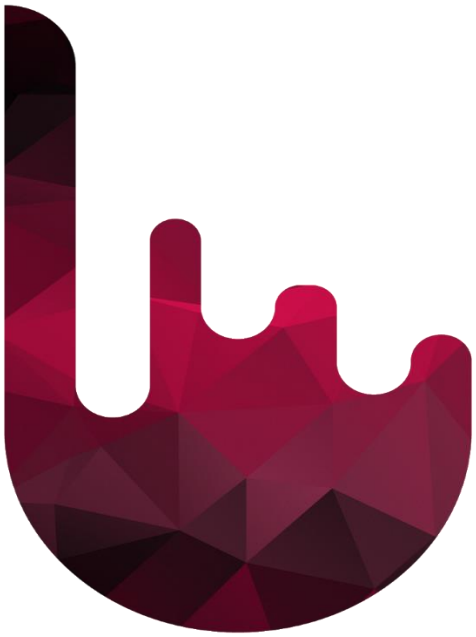
OUTPUT:

```
G:\BscCsit\sem5\Multimedia\lab5\huffmancoding.exe

Enter message:bijay shrestha

Total message length: 14
So, total bits before compressing is 14*8: 112 bits.


Bits given for each character for compressing the given message:
' ': 0111
'a': 110
'b': 1001
'e': 0110
'h': 000
'i': 1000
'j': 111
'r': 0011
's': 010
't': 0010
'y': 101

        Encoded/compressed message:100110001111101010111010000001101100100010000110

        Total bits after compressing: 48 bits.

        Decoded/uncompressed/original message:bijay shrestha

Process returned 0 (0x0)   execution time : 37.708 s
Press any key to continue.
```

TO BE FAMILIARIZE WITH ADOBE PHOTOSHOP.

Logo Design:

- Create a new file, give the width and height in pixels, note that the background is choose transparent.
- Create a new layer, then make a rectangle. Then use pen tool to give extra design.
- Give a color with little bit of gradient.
- To give the poly effect in logo, following steps was taken:
    - Make a Triangular Selection
    - Filter the Selection
    - Repeat Forever
    - Filling in the Gaps
    - Get the Details
- After that, save the file and save it in .png format.



USE ANY ONLINE MORPHING TOOL & MORPH YOUR OWN DESIGN.

Morphing: Morphing is the smooth transformation from one image into another by small gradual steps using computer animation techniques.

Morphing images:

Start image:

Images in morphing process:

End image:

Online Morphing Tool: https://3dthis.com/morph.htm

Screenshot of online morphing tool: