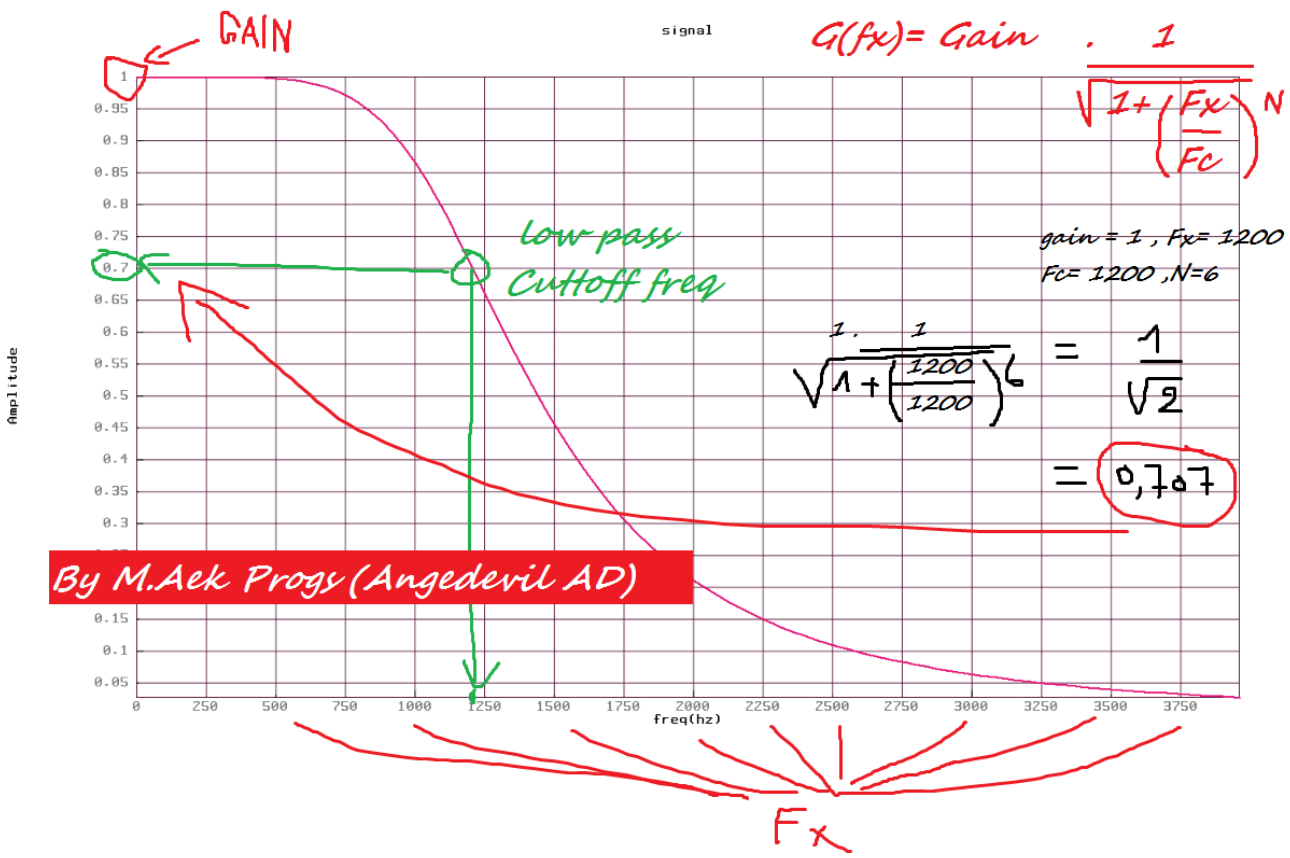
:::LOW PASS Prototype:::



set width
WD = 100
set frequency
F=4000;
set Cuttoff frequency
Fc= 1200;

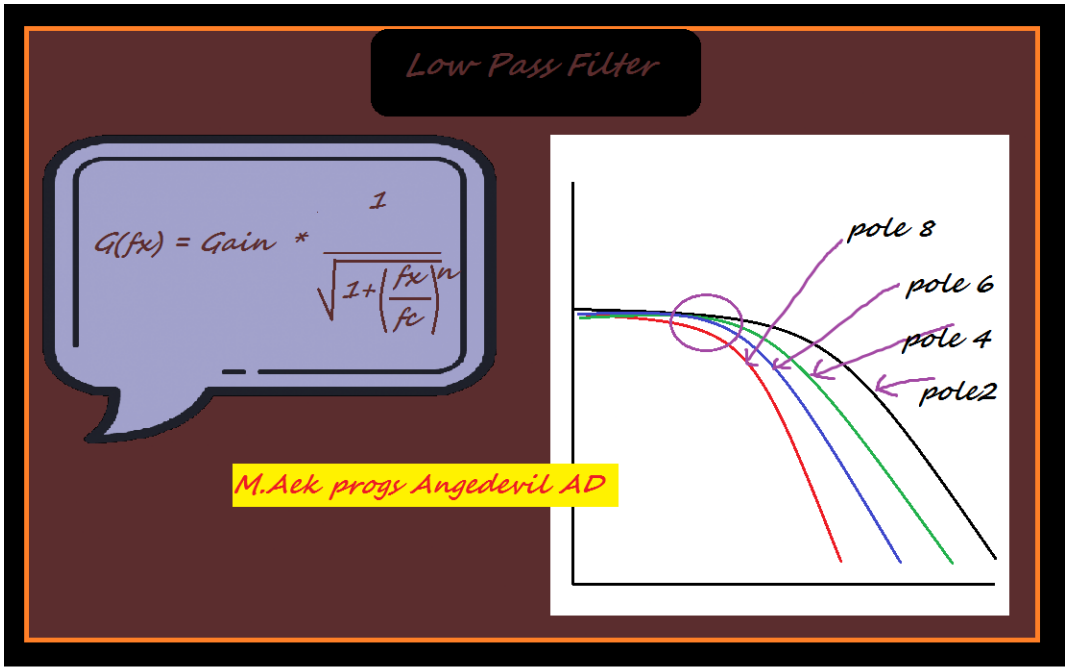
Formula
Fx frequency offset
G(fx) = Gain * (1 / (sqrt (1 + pow(fx/fc , n))))
if WD = 0
fx = F/100 * 0

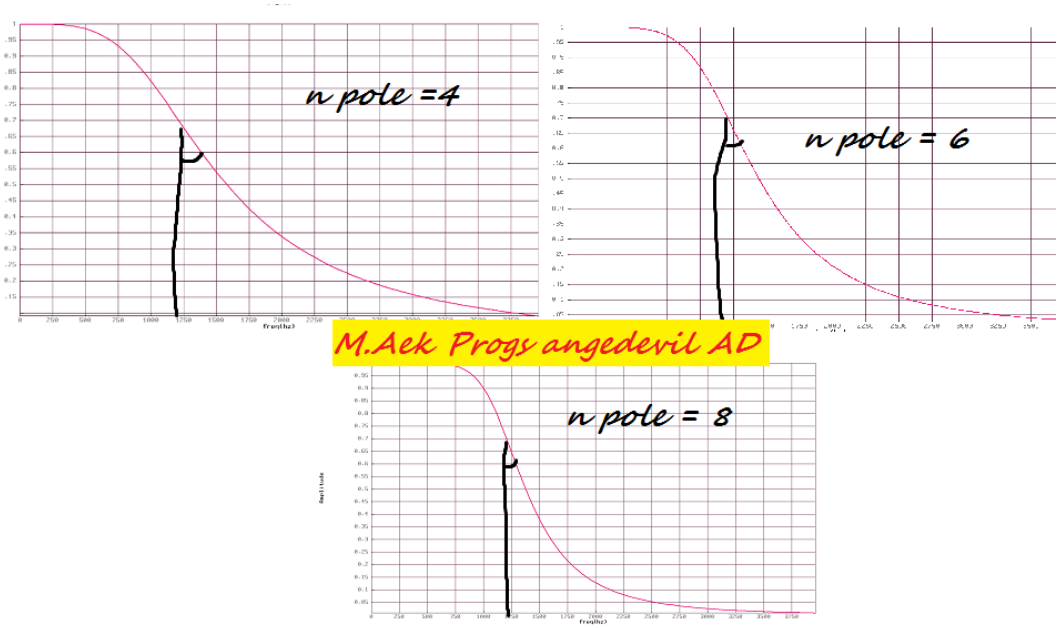
if WD = 1
fx = F/100 * 1

if WD = 100
fx = F/100 * 100

n =num of poles

cuttoff G(fx) at 1200 = 0.707





C ++

```
for(int xx=0;xx<100;xx++)
{

Fx = (4000/100)*xx;

x[0] =1.0;
ydata[xx] = ((1* (1 / ( sqrt(1+ pow(Fx/fc,6) )))));
xdata[xx] =Fx;
printf("\n output == %f hz %f \n",Fx, ydata[xx]);

if(Fx<200)
ydata[xx]=1;

}

ydata[0]=1;
xdata[0]=0;


plotplot(xdata,ydata,100,"signal.png",L"signal",L"freq(hz)",L"Amplitude",230.0,19.0,119.0);
```

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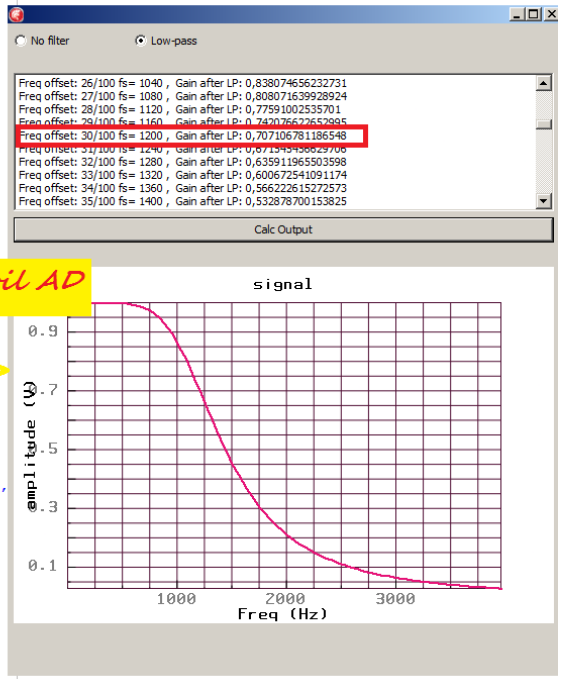
```
output == 920.000000 hz 0.911707
output == 960.000000 hz 0.890114
output == 1000.000000 hz 0.865518
output == 1040.000000 hz 0.838075
output == 1080.000000 hz 0.808072
output == 1120.000000 hz 0.775910
output == 1160.000000 hz 0.742077
output == 1200.000000 hz 0.707107
output == 1240.000000 hz 0.671545
output == 1280.000000 hz 0.635912
output == 1320.000000 hz 0.600673
output == 1360.000000 hz 0.566223
output == 1400.000000 hz 0.532879
```

```
frequency:= 4000; //hertz
fcut := 1200;// hertz
gain := 1.0;//
wd:= 100;// num of fs in frequency


if(LP.Checked) then begin
Memo1.Lines.Add('-------------------------------------');
Memo1.Lines.Add('Low pass filter Prototype: ');
Memo1.Lines.Add('-------------------------------------');

end

else if(NLP.Checked) then begin
Memo1.Lines.Add('-------------------------------------');
Memo1.Lines.Add('NO filter : ');
Memo1.Lines.Add('-------------------------
memo1.Lines.Add('No Filter, output = inp
end;

for xx := 0 to WD do begin

if(LP.Checked) then begin //lowp
fs := (Frequency/WD)*xx; //  get Fs at xx


y_axis[xx] := ((gain* (1 / ( sqrt(1+ power(fs/fcut,6) )))));
x_axis[xx] := fs;

memo1.Lines.Add('Freq offset: '+inttostr(xx)+'/100' + ' fs= '+fs.ToString+  ' ,


if(fs < 200) then
y_axis[xx]:=1.0;

end

else begin //no lp
fs := (Frequency/WD)*xx; //  get Fs at xx
y_axis[xx] :=1.0;
x_axis[xx] := fs;
```

Delphi

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