Lab 7 - Resampling

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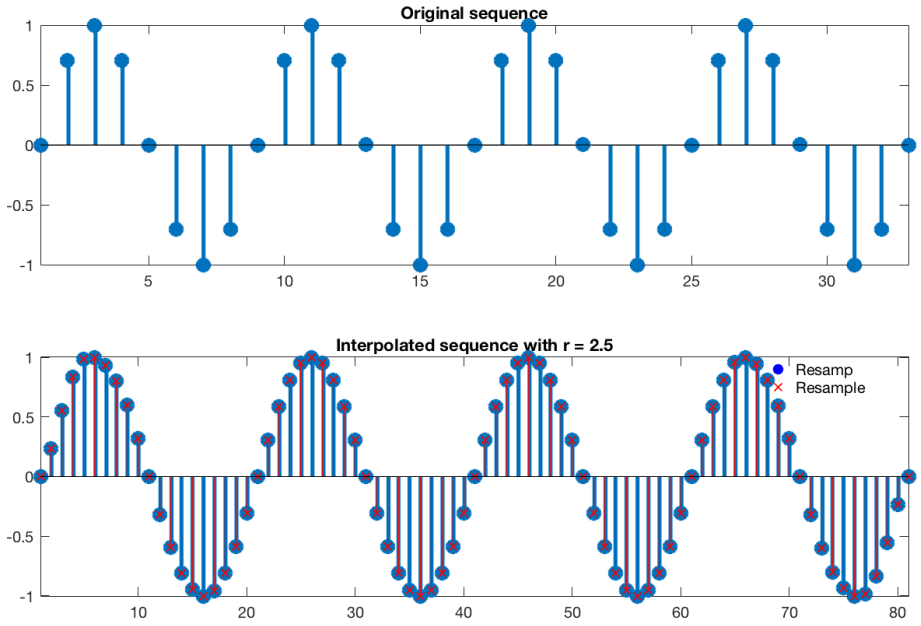
Testing resampling of a sin at (5/2)fs

```
x = sin(2 * pi * (0:32) / 8);
test_resamp(x, 2.5);
```

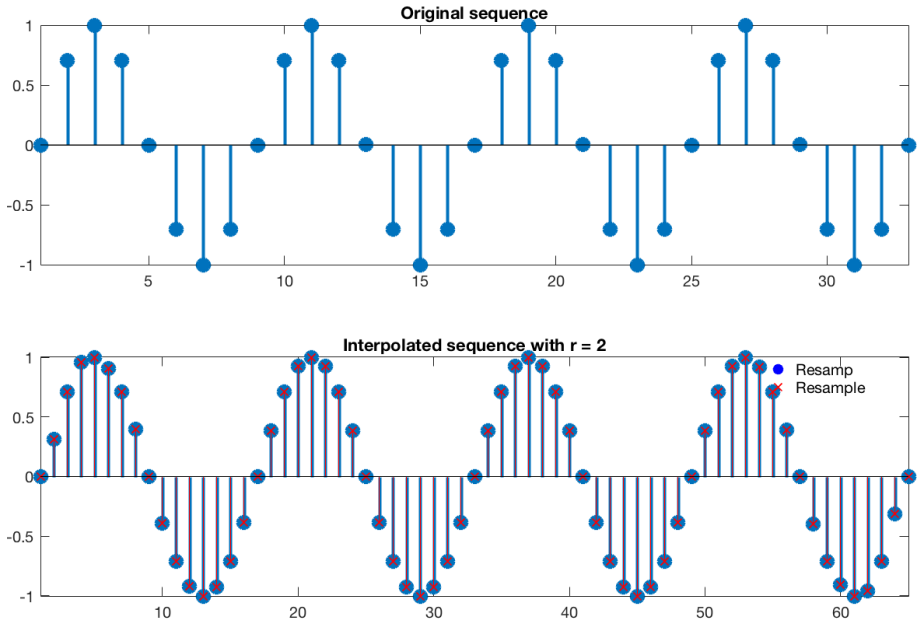
```
seqlength =

   82.5000


f =

    25
```



Testing resampling of a sin at 2fs

```
test_resamp(x, 2);
```

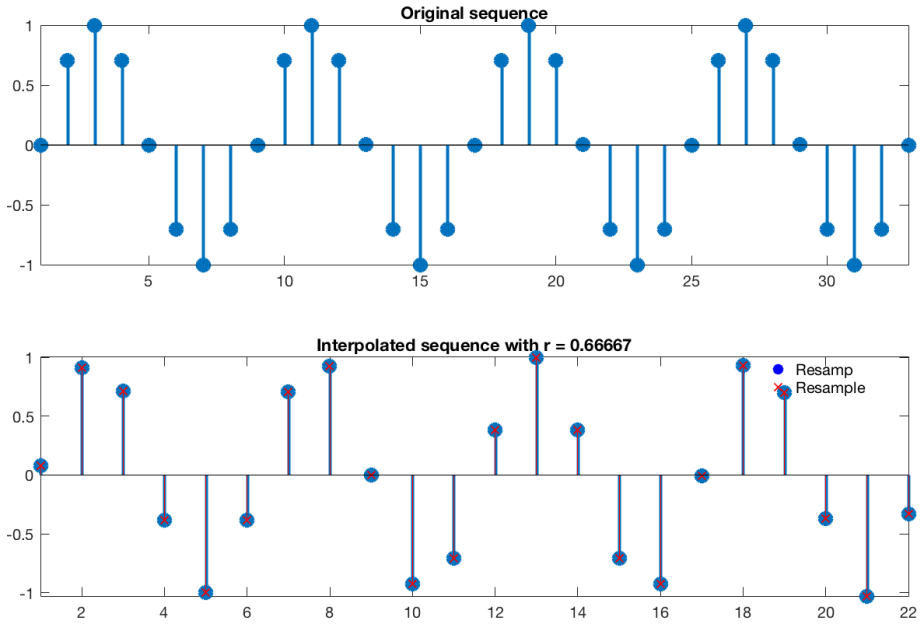
```
seqlength =

    66

f =

    20
```



Testing resampling of a sin at (2/3)fs

```
test_resamp(x, 0.666667);
```

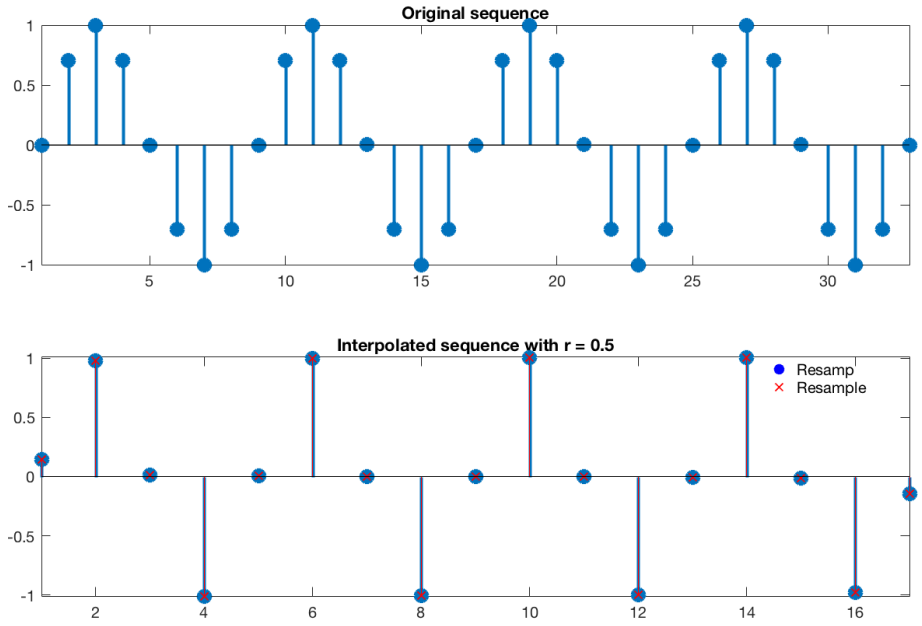
```
seqlength =

    22

f =

    10
```



Testing resampling of a sin at (1/2)fs

```
test_resamp(x, 0.5);

% Make sure that you have the file 'seashell.wav' in your directory
[x, fs] = audioread('seashell.wav');
```

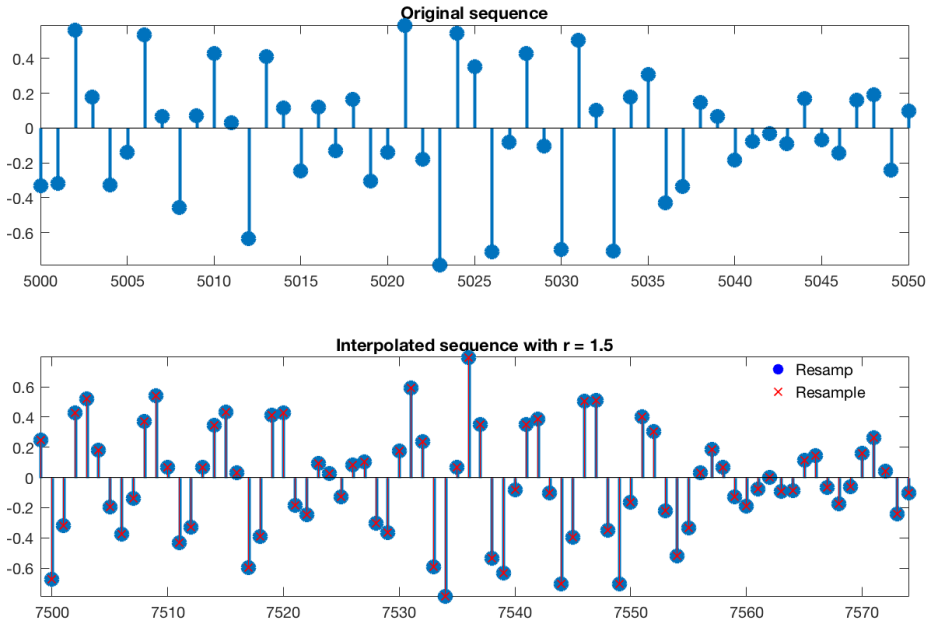
```
seqlength =

   16.5000


f =

    10
```



Testing resampling of 'seashell' at (3/2)fs

```
test_resamp(x, 1.5, 5000, 5050);
```

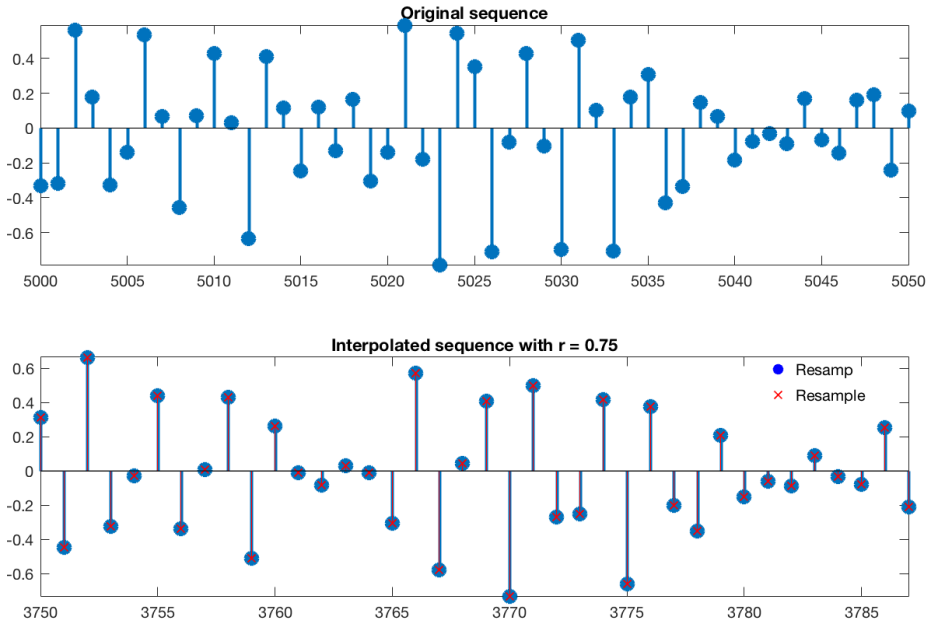
```
seqlength =

       41340

f =

    15
```



Testing resampling of 'seashell' at (3/4s)fs

```
test_resamp(x, 0.75, 5000, 5050);
```

```
seqlength =

       20670

f =

    10
```



Print program

```
disp(' ')
disp('--- resamp.m --------------------------------')
type('resamp')
```

```
--- resamp.m --------------------------------

function y = resamp(x, r)
% RESAMP Resample an input sequence x by a factor of r

% ratio of upsample to downsample
[up down] = rat(r);

 lx=length(x);
 xe=zeros(1, up*lx);

% Up-sample and Det. Wc
 xe(1:up:end) = x;
% Up-sampling
if up>down
     wc= pi/up;
 else
     wc= pi/down;
 end

 fn = wc/pi;
 n = round(1+20/fn);
 h = fir1(n-1, fn, kaiser(n, 5));
```

```
% Take the up-sample signal and filter it
 yup=conv(xe,h);

% Down sample sequ.
 ydown = yup(1:down:end);

% Pull the correct length of the sequence
 seqlength=up/down*lx

 f=round((length(ydown) - seqlength)/2)

 y=ydown(f+1:end -f )*up;

end
```

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