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## Table of Contents

c1_resample.m .....	1
Parameters .....	1
Read input and output files .....	1
Data parameters .....	1
Create new uniform time base .....	2
Resample both signals using interpolation .....	2
Save results .....	2

## c1\_resample.m

```
%{  
Description:  
  Resamples the Cadence data to a constant sampling rate of in the  
  passband. The resampled signals are then saved into a .mat file.  
  
Input:  
  - input_pa.csv  
  - output_pa.csv  
  
Output:  
  - pa_resampled.mat  
%}  
clear; clc; close all;  
tic
```

## Parameters

```
freq_sampling = 37.8e9;  
step_sampling = 1 / freq_sampling;
```

## Read input and output files

```
input_data = readmatrix('input_pa.csv');  
output_data = readmatrix('output_pa.csv');  
  
time_orig = input_data(:,1);  
signal_in = input_data(:,2);  
signal_out = output_data(:,2);
```

## Data parameters

Average sampling frequency

```
freq_sampling_in = length(signal_in)/time_orig(end)  
freq_sampling_out = length(signal_out)/time_orig(end)
```

---

```
freq_sampling_in =  
1.6381e+11
```

```
freq_sampling_out =  
1.6381e+11
```

## Create new uniform time base

```
t_min = time_orig(1);  
t_max = time_orig(end);  
time_uniform = (t_min:step_sampling:t_max).';
```

## Resample both signals using interpolation

```
signal_in_resampled = interp1(time_orig, signal_in, time_uniform);  
signal_out_resampled = interp1(time_orig, signal_out, time_uniform);
```

## Save results

```
script_folder = fileparts(mfilename('fullpath'));  
mat_filename = fullfile(script_folder, 'pa_resampled.mat');  
  
save(mat_filename, 'time_uniform', 'signal_in_resampled', 'signal_out_resampled',  
'v7.3');  
disp(['Signals resampled and saved in ', mat_filename]);
```

```
toc
```

```
Signals resampled and saved in C:\Users\Shoit\Desktop  
\pa_db_1p8_5p4\f3_pa_demod\pa_resampled.mat  
Elapsed time is 23.127522 seconds.
```

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