

HW6 Report

309513073 黃威誠

■ HW6

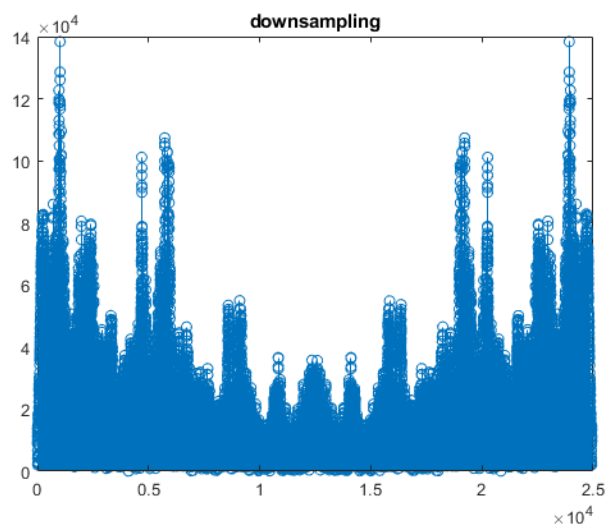
– For a given signal, try to conduct downsampling with a largest factor without causing distortion.

將題目給予的a1 signal 和上課一樣處理downsampling

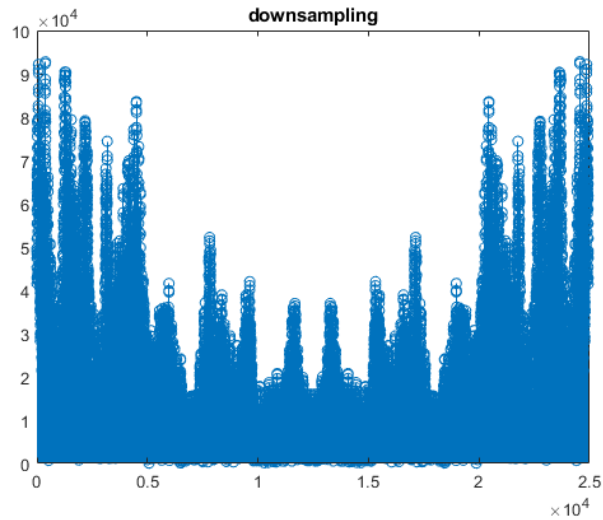
```
ad = a1(1:df:end); % downsampling
```

並且慢慢調整downsampling factor

df = 5



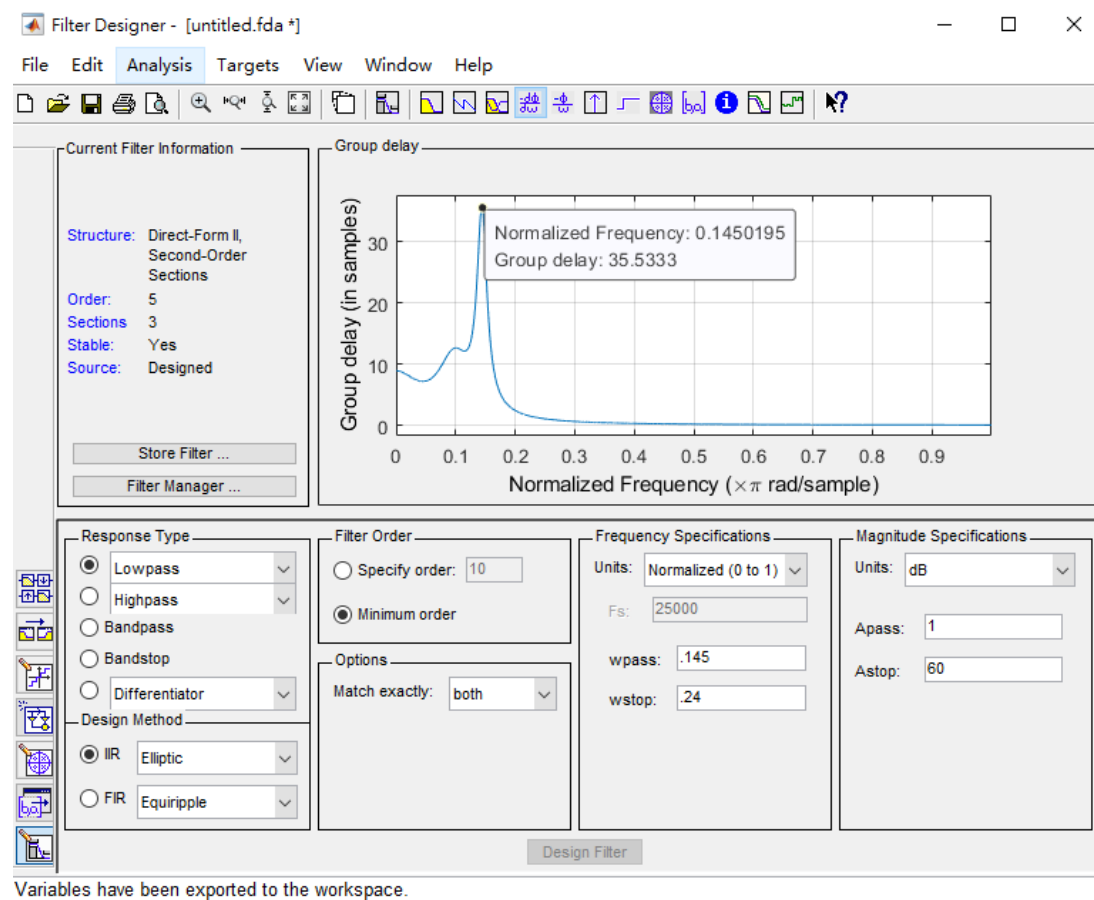
$$df = 6$$



可以看到大約在5的時候就到極限了，再多下去就有明顯Aliasing的情況

– Design a filter and conduct upsampling to recover the signal.

Design Filter

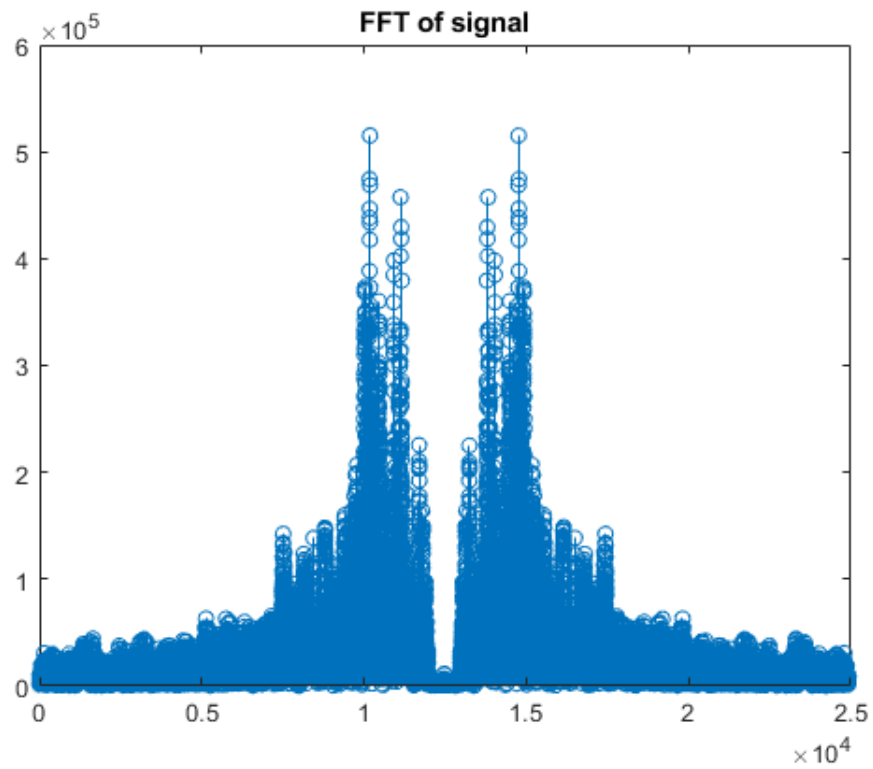


也和Practice一樣去upsampling

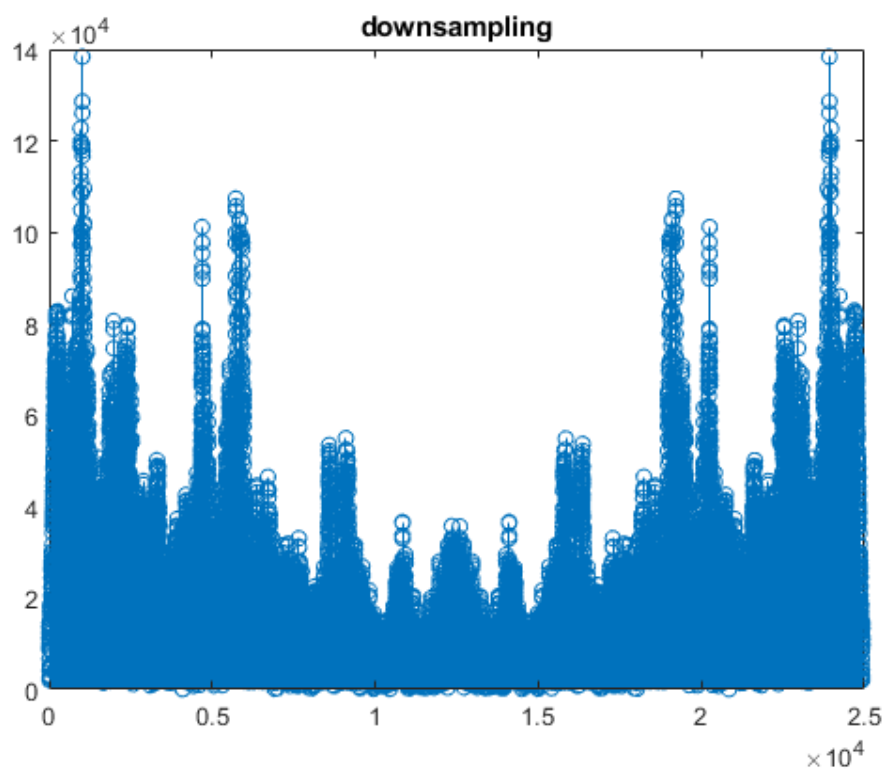
```
adu = zeros(n*uf,1);
```

```
adu(1:uf:end)=ad;
```

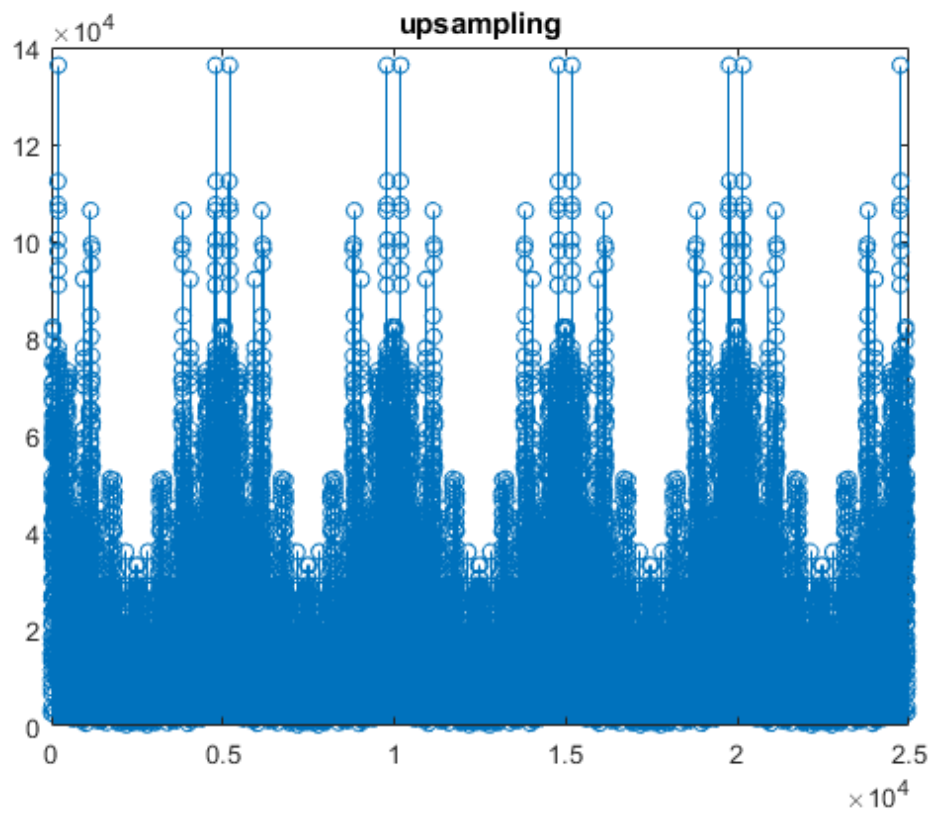
Result:



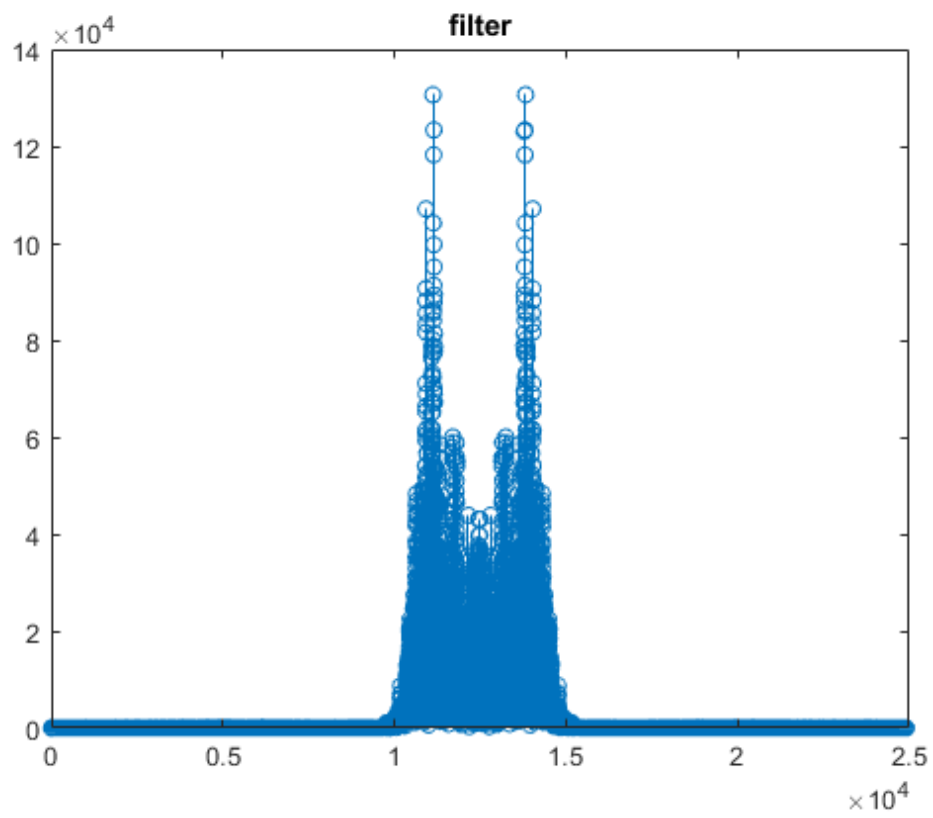
↓

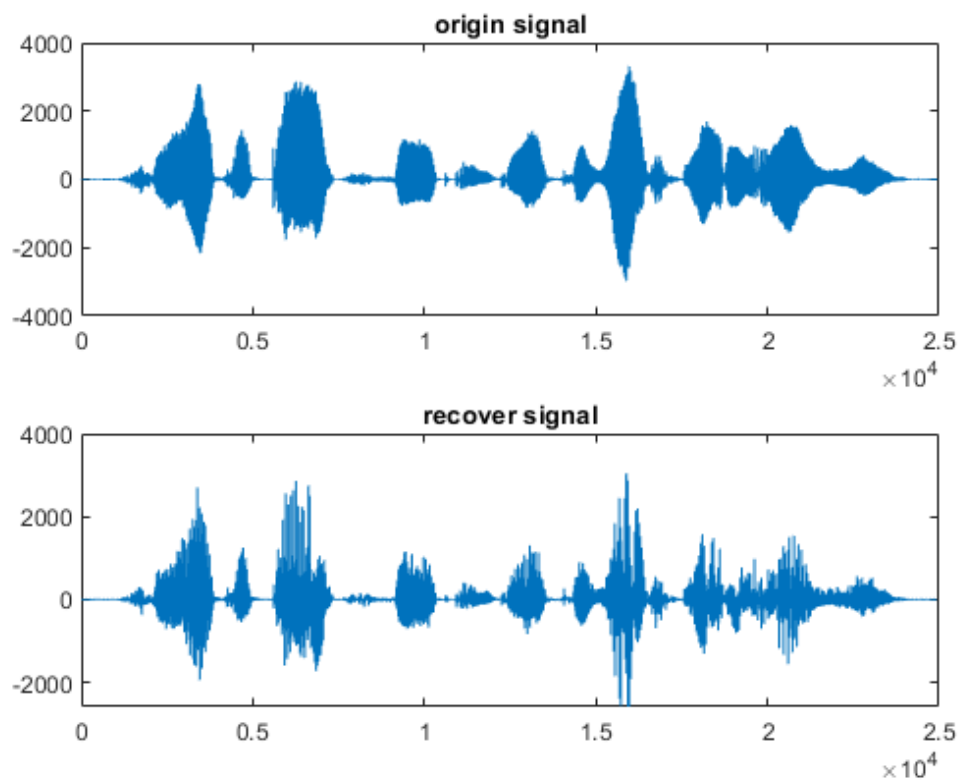


↓



↓





Conclusion

這次學了upsampling和downsampling再關於訊號處理的部分是如何實際去做取樣，來實現ADC及DAC，並且使用Design Filter這個App來設計我們的Filter，然後將濾波器參數Export出來使用，相當實用而且好理解。