DIGITAL SIGNAL PROCESSING – EC5010 LABORATORY SESSION 1

DIGITAL SIGNAL PROCESSING THEORY AND APPLICATION

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PART1: SAMPLING, TIME DOMAIN & FREQUENCY DOMAIN REPRESENTATION

Generate the digital signal, x[n], obtained in your pre-lab.

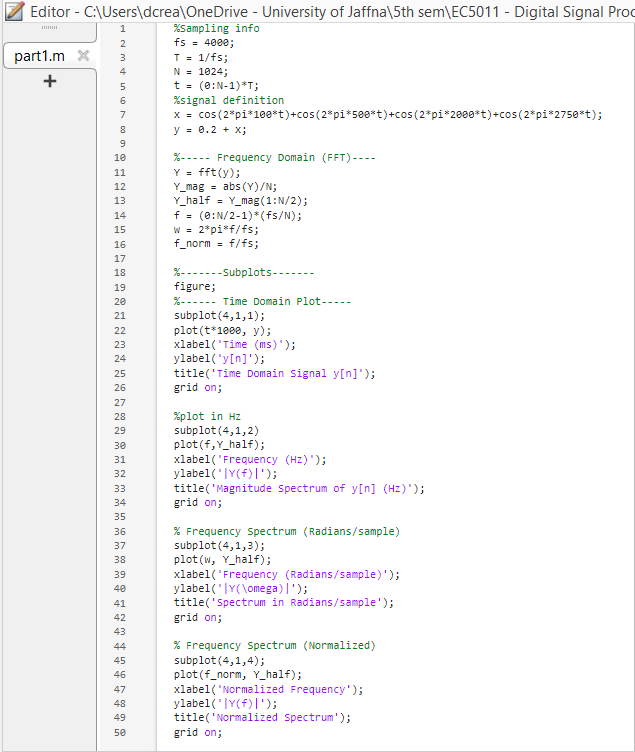
y[n]=0.2+x(n) (1)

Plot y[n] scaling the x-axis to ms.

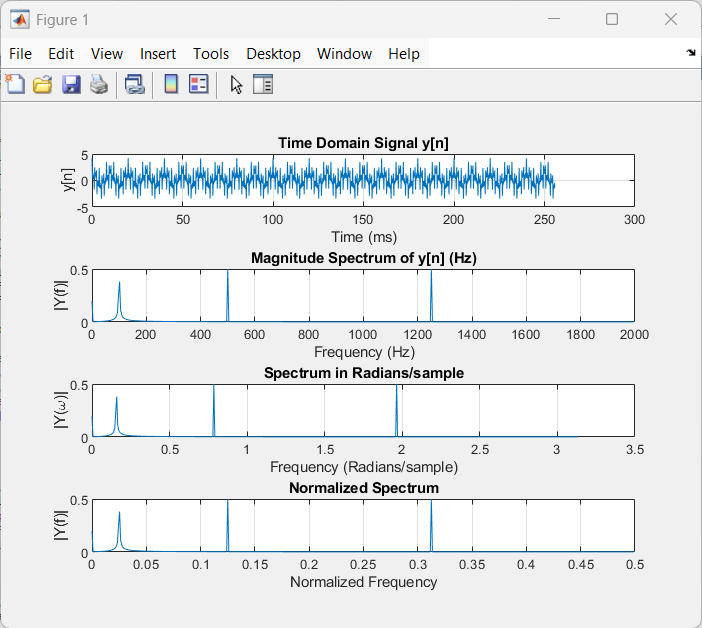
**PART 01**

1.)

**CODE**



**OUTPUT**



2.)

The DC value = 0.2

3.)

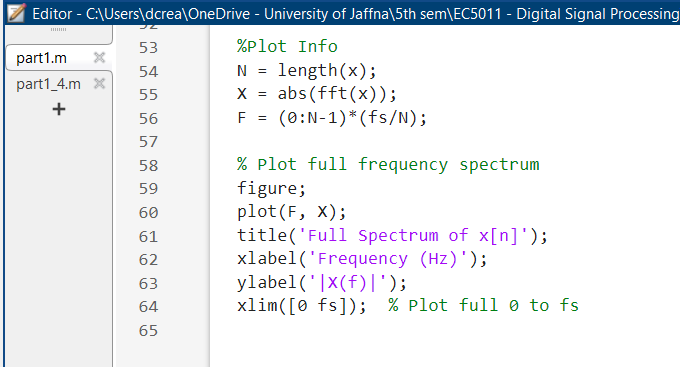
fa ​= ∣ f − k⋅fs ​∣ such that fa ​<fs​/2

fa =∣2750−4000∣=1250 Hz

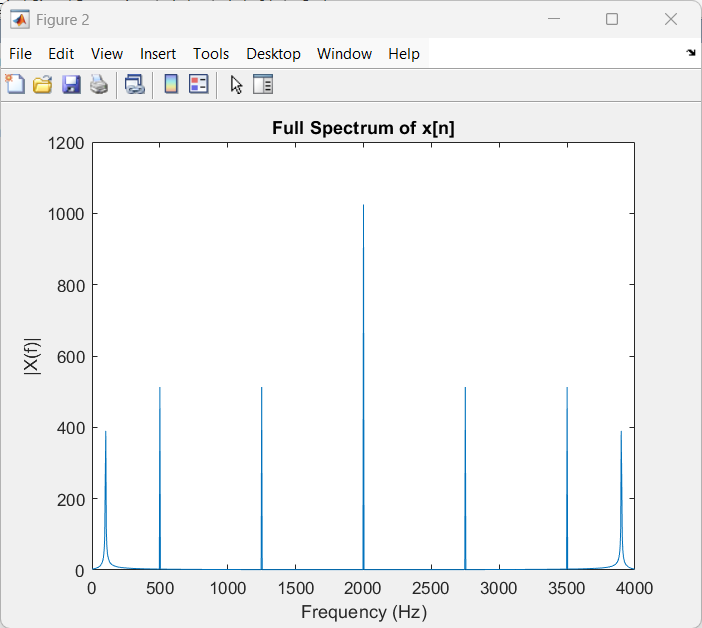
\* Aliased frequency component = 1250 Hz

4.)

**CODE**

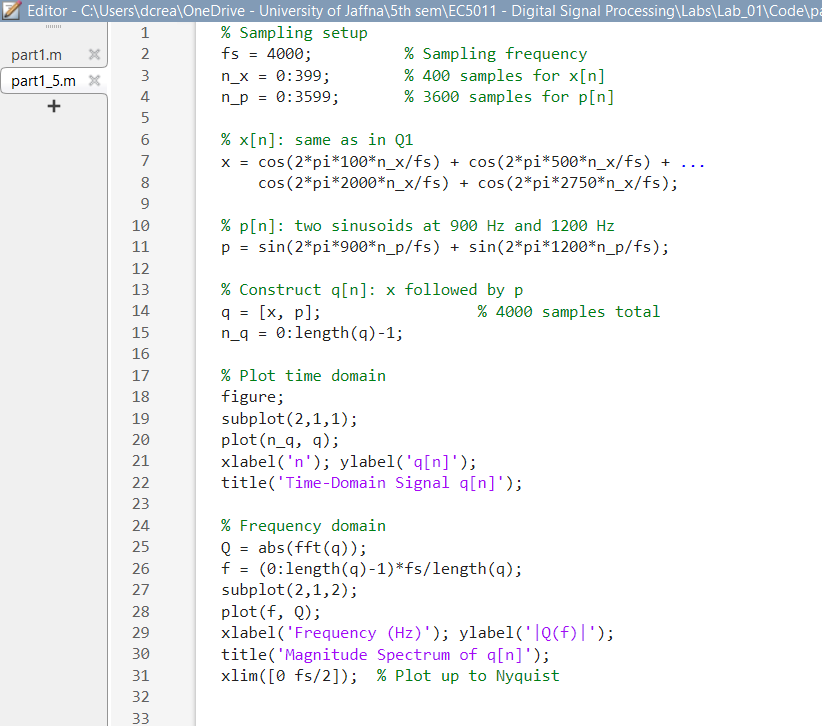


**OUTPUT**

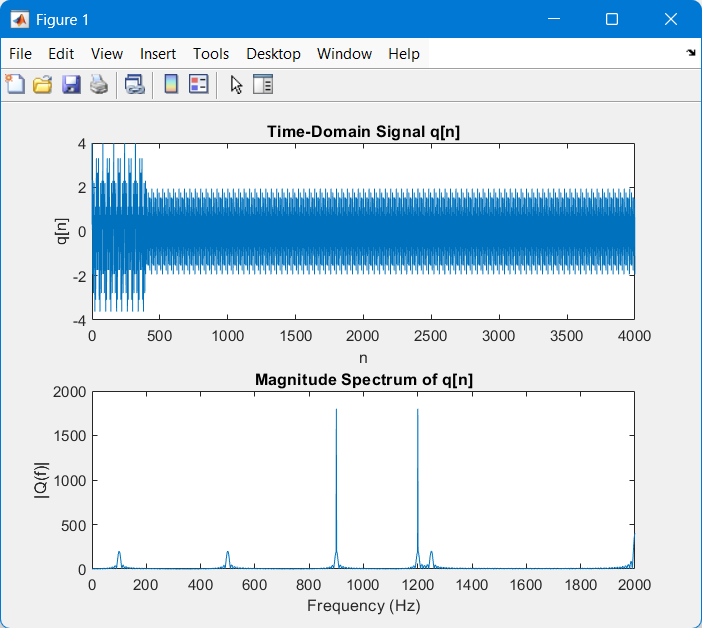
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5.)

**CODE**

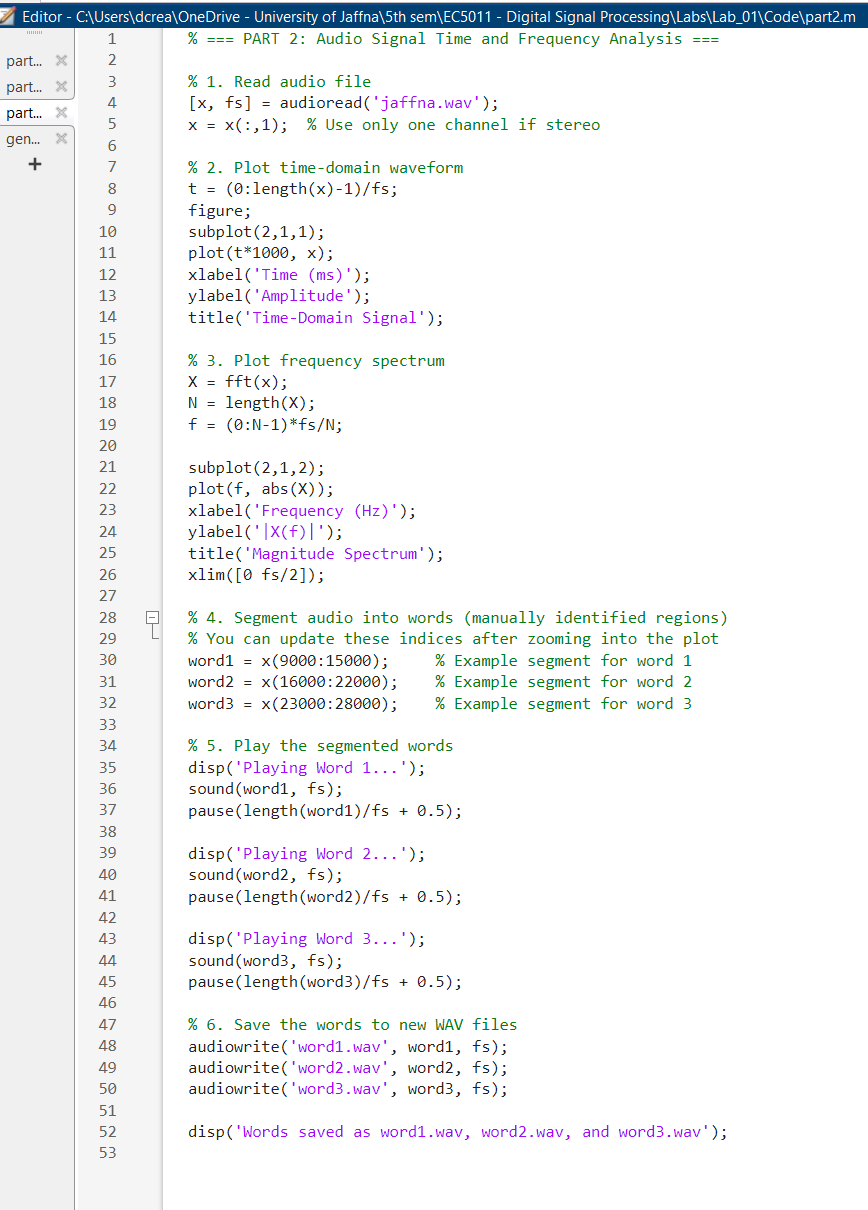
****

**OUTPUT**

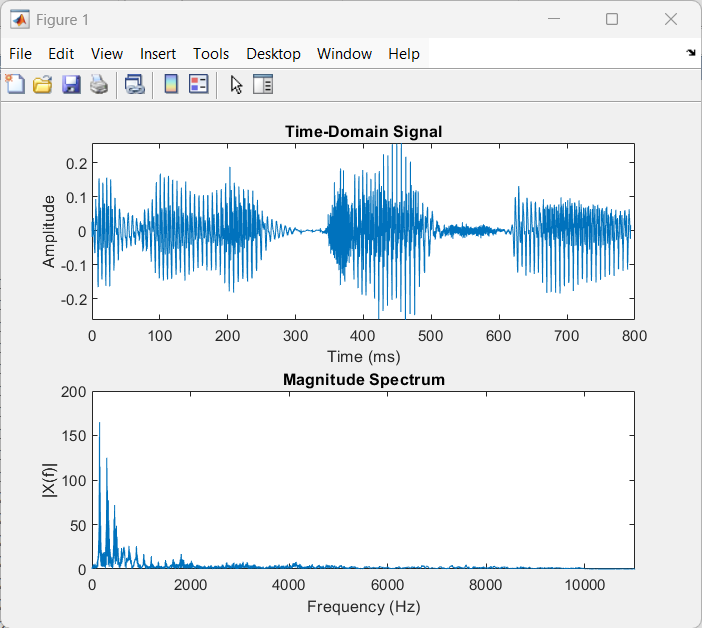
****

**PART 02**

**CODE**

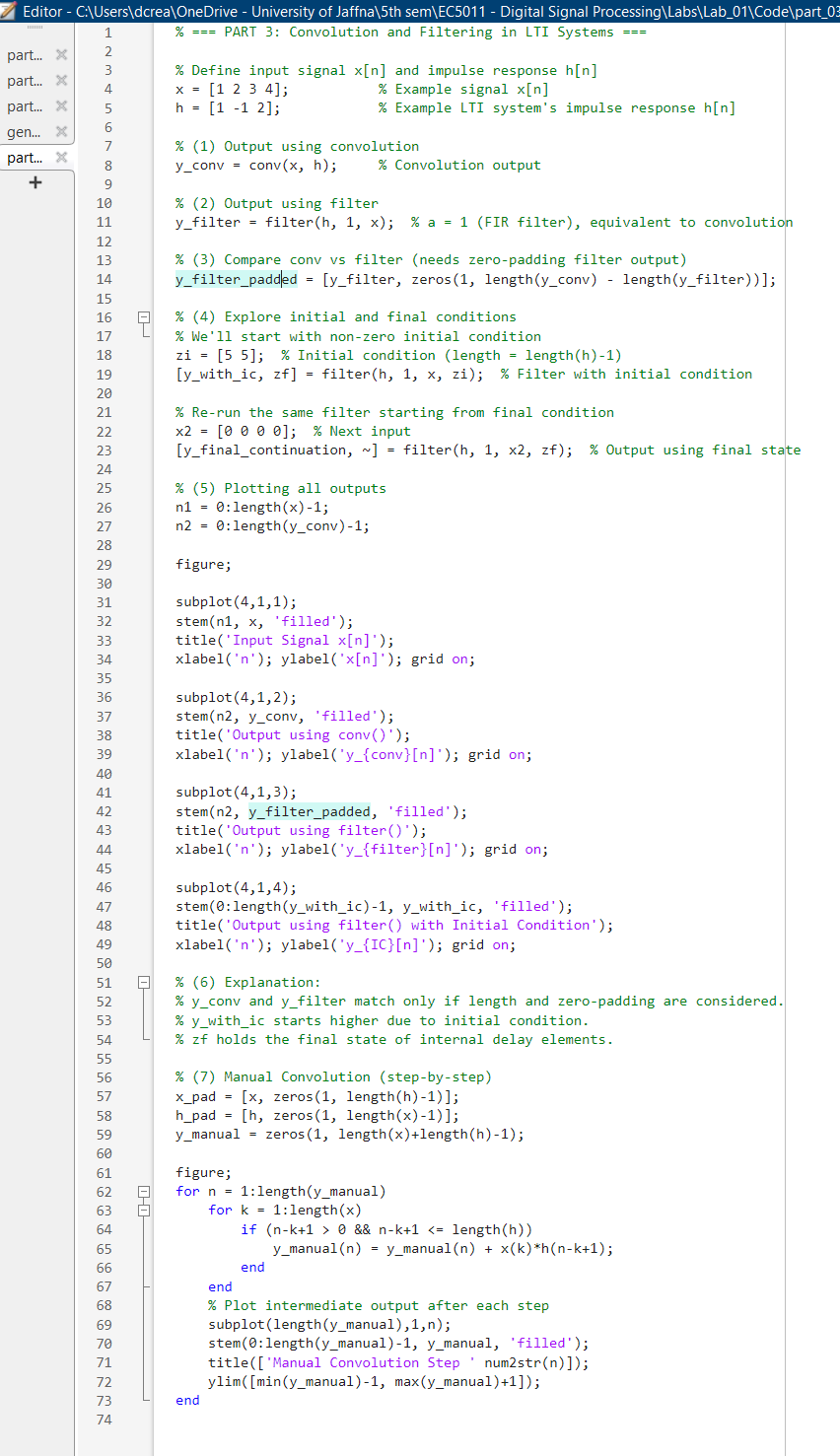
****

**OUTPUT**

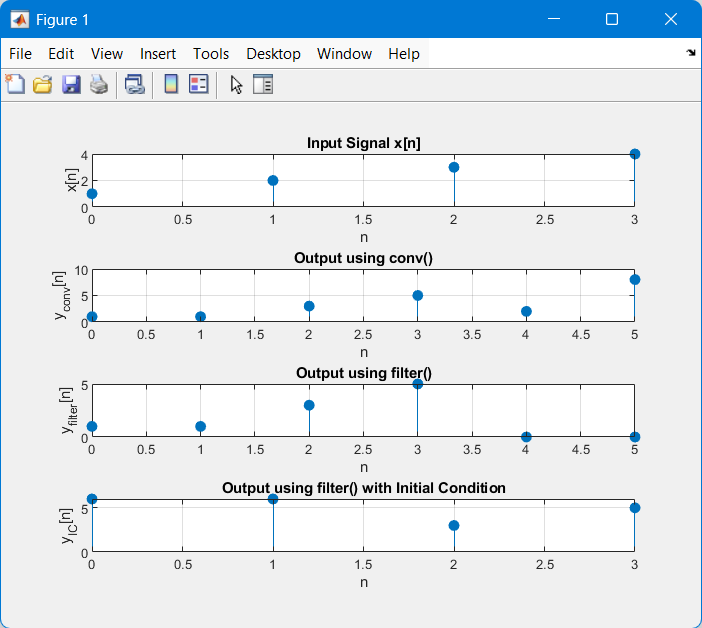
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**PART 03**

**CODE**

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**OUTPUT**

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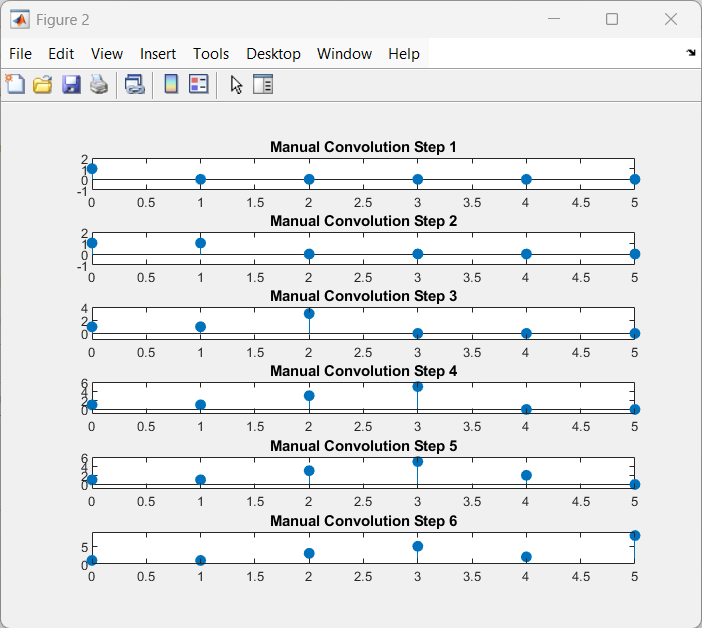
0.6 )

 Convolution output is longer (length = Lx + Lh −1) and shows full filter effect.

 Filter output is same size as x(n)x(n)x(n); assumes causal FIR system.

 Filter with final condition is used when processing a signal in chunks.

0.7 )

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