Phil Nevins  
ECE 315 Signals and Systems  
HW#2 Problem 2

**PART A**  
**x1[n] and y1[n]**

Chart, scatter chart

Description automatically generated

# -\*- coding: utf-8 -\*-

"""

Philip Nevins

10/21/2022

ECE 315 Signals & Systems

HW#2, Problem 2a

"""

import numpy as np

import matplotlib.pyplot as plt

#Setup Plot

plt.style.use('seaborn-whitegrid')

fig, (ax1, ax2) = plt.subplots(2, figsize=(15, 5), sharex=True)

#Plot Points y1[n]

for i in range(0, 20):

ax2.stem(i, -0.5)

ax2.stem(-1, 5)

ax2.stem(20, 5)

for i in range(-5, 0):

ax2.stem(i, 0)

for i in range (20, 25):

ax2.stem(i, 0)

#Plot Points x1[n]

for i in range(0, 20):

ax1.stem(i, (5 - i/2))

for i in range(-5, 0):

ax1.stem(i, 0)

for i in range (20, 25):

ax1.stem(i, 0)

#Plot Settings

ax2.set\_xlabel("Time $n$", fontsize='large')

ax2.set\_ylabel("Signal Function $y1[n]$", fontsize='large')

ax2.set\_title("Signal $y1[n]$ v Time $n$", fontsize='x-large')

ax1.set\_ylabel("Signal Function $x1[n]$", fontsize='large')

ax1.set\_title("Signal $x1[n]$ v Time $n$", fontsize='x-large')

**x2[n] and y2[n]**

Chart, scatter chart

Description automatically generated

# -\*- coding: utf-8 -\*-

"""

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HW#2, Problem 2a

"""

import numpy as np

import matplotlib.pyplot as plt

#Setup Plot

plt.style.use('seaborn-whitegrid')

fig, (ax1, ax2) = plt.subplots(2, figsize=(15, 5), sharex=True)

#Plot Points y2[n]

for i in range(0, 20):

ax2.stem(i, -0.5)

ax2.stem(-1, 5)

ax2.stem(20, 5)

for i in range(-5, 0):

ax2.stem(i, 0)

for i in range (20, 25):

ax2.stem(i, 0)

#Plot Points x2[n]

for i in range(0, 20):

ax1.stem(i, (5 - i/2 - 1))

for i in range(-5, 0):

ax1.stem(i, -1)

for i in range (20, 25):

ax1.stem(i, -1)

#Plot Settings

ax2.set\_xlabel("Time $n$", fontsize='large')

ax2.set\_ylabel("Signal Function $y2[n]$", fontsize='large')

ax2.set\_title("Signal $y2[n]$ v Time $n$", fontsize='x-large')

ax1.set\_ylabel("Signal Function $x2[n]$", fontsize='large')

ax1.set\_title("Signal $x2[n]$ v Time $n$", fontsize='x-large')

**PART B**

**x3[n] and y3[n]**

Chart, scatter chart

Description automatically generated

# -\*- coding: utf-8 -\*-

"""

Philip Nevins

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ECE 315 Signals & Systems

HW#2, Problem 2b

"""

import numpy as np

import matplotlib.pyplot as plt

#Setup Plot

plt.style.use('seaborn-whitegrid')

fig, (ax1, ax2) = plt.subplots(2, figsize=(15, 5), sharex=True)

#Plot Points y3[n]

for i in range(0, 20):

ax2.stem(i, -0.5)

ax2.stem(-1, 4)

ax2.stem(20, 6)

for i in range(-5, 0):

ax2.stem(i, 0)

for i in range (20, 25):

ax2.stem(i, 0)

#Plot Points x3[n]

for i in range(0, 20):

ax1.stem(i, (5 - i/2 - 1))

for i in range(-5, 0):

ax1.stem(i, 0)

for i in range (20, 25):

ax1.stem(i, 0)

#Plot Settings

ax2.set\_xlabel("Time $n$", fontsize='large')

ax2.set\_ylabel("Signal Function $y3[n]$", fontsize='large')

ax2.set\_title("Signal $y3[n]$ v Time $n$", fontsize='x-large')

ax1.set\_ylabel("Signal Function $x3[n]$", fontsize='large')

ax1.set\_title("Signal $x3[n]$ v Time $n$", fontsize='x-large')

**PART C**

**Accumulation. ~x[n] and y2[m]**

A picture containing chart

Description automatically generated

**Calculated by visual inspection of y2[m]**

# -\*- coding: utf-8 -\*-

"""

Philip Nevins

10/21/2022

ECE 315 Signals & Systems

HW#2, Problem 2c

"""

import numpy as np

import matplotlib.pyplot as plt

#Setup Plot

plt.style.use('seaborn-whitegrid')

fig, (ax1, ax2) = plt.subplots(2, figsize=(15, 5), sharex=True)

#Plot Points y2[m]

for i in range(0, 20):

ax2.stem(i, -0.5)

ax2.stem(-1, 5)

ax2.stem(20, 5)

for i in range(-5, -1):

ax2.stem(i, 0)

for i in range(21, 26):

ax2.stem(i, 0)

#Plot Points x[n]

for i in range(0, 20):

ax1.stem(i, (4 - i/2))

ax1.stem(-1, 5)

ax1.stem(20, 0)

for k in range(-5, -1):

ax1.stem(k, 0)

for j in range (21, 25):

ax1.stem(j, 0)

#Plot Settings

ax2.set\_xlabel("Time $m$", fontsize='large')

ax2.set\_ylabel("Signal Function $y2[m]$", fontsize='large')

ax2.set\_title("Signal $y2[m]$ v Time $m$", fontsize='x-large')

ax1.set\_ylabel("Signal Function $xTilda[n]$", fontsize='large')

ax1.set\_title("Signal $xTilda[n]$ v Time $n$", fontsize='x-large')