Actividad #8

Almacenamiento y Carga dinamico de Datasets CSV

- Nombre:
- Fecha:
- Reposiroty: https://github.com/vasanza/SSE
- Refrence: https://github.com/vasanza/Matlab_Code/tree/main

Table of Contents

Descripción:

Objetivos:

- Generar y visualizar señales senoidales con diferentes parámetros.
- Organizar los datos en un arreglo tipo dataset combinando múltiples señales y **TimeStamp**.
- Exportar datos generados en MATLAB a un archivo **dataset.CSV** utilizando funciones personalizadas.
- Mantener una estructura de proyecto ordenada y respaldada usando carpetas y funciones (`src`, `git_sse`, `fSave_file`).

Copia la actividad en tu respaldo

```
%Configuracion de carpeta ./src para librerias
addpath(genpath('./src'));

% Definir rutas
miRespaldo = 'C:\Desktop\SSE_vic';  %<========
repositorio = 'C:\Desktop\SSE\2025';%<========

if true
    % repositorio -> respaldo
    git_sse(miRespaldo)
else
    % Mombre de la carpeta de la Actividad en el repositorio
    nombreCarpeta = string(split(cd, filesep));
```

```
    nombreCarpeta = nombreCarpeta(end) % Nombre de la carpeta
    % Regresar al repositorio
    cd(fullfile(repositorio,nombreCarpeta))
end
```

Desarrollo de la Actividad

Paso 1: Borrar variables en el workspace y limpiar cmd

```
clear % Borrar variables en el workspace y libera memoria RAM
clc % Limpia el Command Window
addpath(genpath('./src'));
```

Paso 2: Crear un codigo basico

```
% Parámetros
f = 2;          % Frecuencia de la señal en Hz
A1 = 3;           % Amplitud1
A2 = 16;           % Amplitud1
fase1 = 0;       % Fase1
fase2 = 10;      % Fase2
T = 10;           % Duración en segundos
fsmin = f*2;     % Frecuencia de muestreo minima (Nyquist-Shannon)
fs = 20;       % Frecuencia de muestreo en Hz
```

Documentacion de la senal senoidal

```
help senal_senoidal
```

```
  --- SEÑAL SENOIDAL ---
 function [y] = senal_senoidal(frecuencia,amplitud,fase,tiempo,fs)

  Parámetros:
  f = 10;         % Frecuencia en Hz
  A = 1;          % Amplitud
  fase1 = 0; fase2 = 10;        % Fase
  T = 1;          % Duración en segundos
  fs = 1000;      % Frecuencia de muestreo en Hz
```

```
% Usamos la funcion: senal_senoidal(frecuencia,amplitud,fase,tiempo,fs)
y1 = senal_senoidal(f,A1,fase1,T,fs)';
y2 = senal_senoidal(f,A2,fase2,T,fs)';
y3 = y1 + y2;
y4 = y1 - y2;
```

Paso 3: TimeStamp (dd-MMM-yyyy HH:mm:ss.SSS)

```
simulationTime = seconds(0:1/fs:T)
```

```
simulationTime = 1×201 duration
0 sec        0.05 sec     0.1 sec      0.15 sec     0.2 sec      0.25 sec     0. ···
```

```
%setear formto de tiempo en milisegundos
```

```
startTime = datetime
   14-Jun-2025 08:22:38.197
```

```
startTime = datetime('now', 'Format', 'dd-MMM-yyyy HH:mm:ss.SSS')
timeStamp = (startTime + simulationTime)'
```

```
timeStamp = 201×1 datetime
14-Jun-2025 08:22:38.197
14-Jun-2025 08:22:38.247
14-Jun-2025 08:22:38.297
14-Jun-2025 08:22:38.347
14-Jun-2025 08:22:38.397
14-Jun-2025 08:22:38.447
14-Jun-2025 08:22:38.497
14-Jun-2025 08:22:38.547
14-Jun-2025 08:22:38.597
14-Jun-2025 08:22:38.647
     ⋮
```

```
timeStamp.Format
```

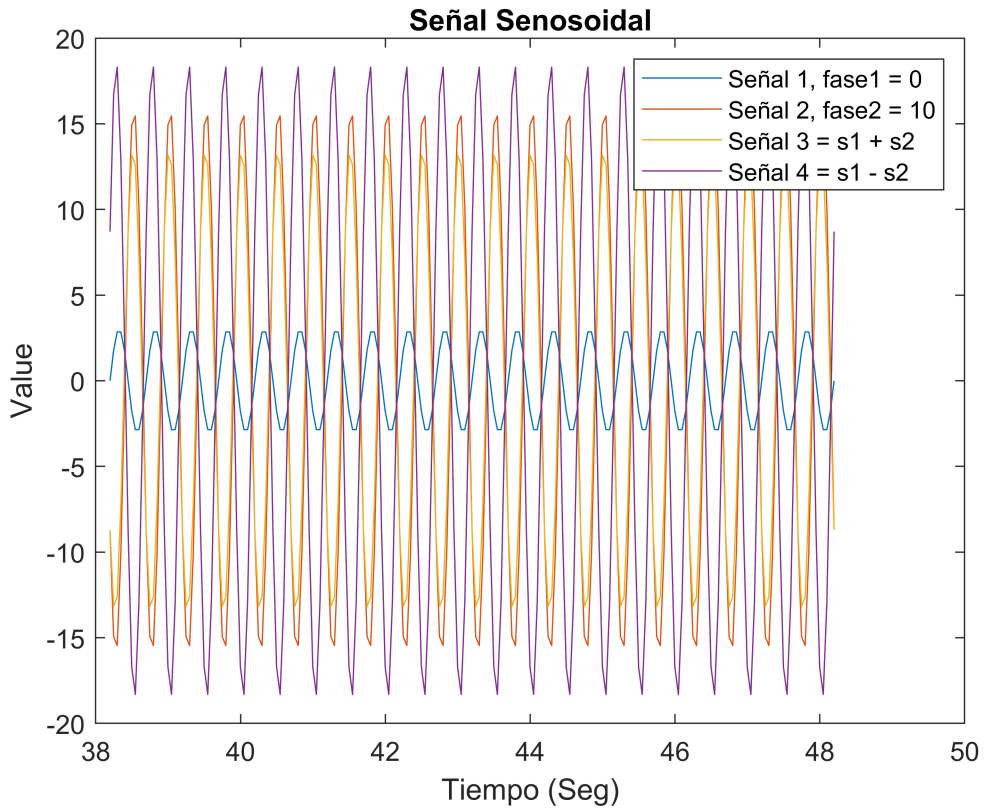
```
ans =
'dd-MMM-yyyy HH:mm:ss.SSS'
```

```
size(timeStamp) %filas, columnas
```

```
ans = 1×2
   201     1
```

Paso 4: Mostrar resultados con plot

```
figure
plot(timeStamp.Second,y1) %Señal 1
hold on
plot(timeStamp.Second,y2) %Señal 2
plot(timeStamp.Second,y3) %Señal 3
plot(timeStamp.Second,y4) %Señal 4
title("Señal Senosoidal")
xlabel("Tiempo (Seg)")
ylabel("Value")
legend("Señal 1, fase1 = 0", "Señal 2, fase2 = 10", "Señal 3 = s1 + s2"...
    , "Señal 4 = s1 - s2")
hold off
```



Paso 5: crear dataset usando tablas

```
%cell array
VariableNames = {'TimeStamp', 'y1 = Sin1', 'y2 = Sin2', 'Y3 = y1 + y2'...
    , 'Y4 = y1 - y2'}
```

```
VariableNames = 1×5 cell
'TimeStamp'  'y1 = Sin1'  'y2 = Sin2'  'Y3 = y1 + y2''Y4 = y1 - y2'
```

```
% Para la tabla el timeStamp debe ser una columna
dataset = table(timeStamp, y1, y2, y3, y4, 'VariableNames',VariableNames)
```

```
dataset = 201×5 table
```

	TimeStamp	y1 = Sin1	y2 = Sin2	Y3 = y1 + y2	Y4 = y1 - y2
1	14-Jun-2025 08:22:38.197	0	-8.7043	-8.7043	8.7043
2	14-Jun-2025 08:22:38.247	1.7634	-14.9331	-13.1697	16.6964
3	14-Jun-2025 08:22:38.297	2.8532	-15.4579	-12.6047	18.3110
4	14-Jun-2025 08:22:38.347	2.8532	-10.0783	-7.2251	12.9315
5	14-Jun-2025 08:22:38.397	1.7634	-0.8491	0.9142	2.6125
6	14-Jun-2025 08:22:38.447	0	8.7043	8.7043	-8.7043
7	14-Jun-2025 08:22:38.497	-1.7634	14.9331	13.1697	-16.6964
8	14-Jun-2025 08:22:38.547	-2.8532	15.4579	12.6047	-18.3110

	TimeStamp	y1 = Sin1	y2 = Sin2	Y3 = y1 + y2	Y4 = y1 - y2
9	14-Jun-2025 08:22:38.597	-2.8532	10.0783	7.2251	-12.9315
10	14-Jun-2025 08:22:38.647	-1.7634	0.8491	-0.9142	-2.6125
11	14-Jun-2025 08:22:38.697	0	-8.7043	-8.7043	8.7043
12	14-Jun-2025 08:22:38.747	1.7634	-14.9331	-13.1697	16.6964
13	14-Jun-2025 08:22:38.797	2.8532	-15.4579	-12.6047	18.3110
14	14-Jun-2025 08:22:38.847	2.8532	-10.0783	-7.2251	12.9315
15	14-Jun-2025 08:22:38.897	1.7634	-0.8491	0.9142	2.6125
16	14-Jun-2025 08:22:38.947	0	8.7043	8.7043	-8.7043
17	14-Jun-2025 08:22:38.997	-1.7634	14.9331	13.1697	-16.6964
18	14-Jun-2025 08:22:39.047	-2.8532	15.4579	12.6047	-18.3110
19	14-Jun-2025 08:22:39.097	-2.8532	10.0783	7.2251	-12.9315
20	14-Jun-2025 08:22:39.147	-1.7634	0.8491	-0.9142	-2.6125
21	14-Jun-2025 08:22:39.197	0	-8.7043	-8.7043	8.7043
22	14-Jun-2025 08:22:39.247	1.7634	-14.9331	-13.1697	16.6964
23	14-Jun-2025 08:22:39.297	2.8532	-15.4579	-12.6047	18.3110
24	14-Jun-2025 08:22:39.347	2.8532	-10.0783	-7.2251	12.9315
25	14-Jun-2025 08:22:39.397	1.7634	-0.8491	0.9142	2.6125
26	14-Jun-2025 08:22:39.447	0	8.7043	8.7043	-8.7043
27	14-Jun-2025 08:22:39.497	-1.7634	14.9331	13.1697	-16.6964
28	14-Jun-2025 08:22:39.547	-2.8532	15.4579	12.6047	-18.3110
29	14-Jun-2025 08:22:39.597	-2.8532	10.0783	7.2251	-12.9315
30	14-Jun-2025 08:22:39.647	-1.7634	0.8491	-0.9142	-2.6125
31	14-Jun-2025 08:22:39.697	0	-8.7043	-8.7043	8.7043
32	14-Jun-2025 08:22:39.747	1.7634	-14.9331	-13.1697	16.6964
33	14-Jun-2025 08:22:39.797	2.8532	-15.4579	-12.6047	18.3110
34	14-Jun-2025 08:22:39.847	2.8532	-10.0783	-7.2251	12.9315
35	14-Jun-2025 08:22:39.897	1.7634	-0.8491	0.9142	2.6125
36	14-Jun-2025 08:22:39.947	0	8.7043	8.7043	-8.7043
37	14-Jun-2025 08:22:39.997	-1.7634	14.9331	13.1697	-16.6964
38	14-Jun-2025 08:22:40.047	-2.8532	15.4579	12.6047	-18.3110
39	14-Jun-2025 08:22:40.097	-2.8532	10.0783	7.2251	-12.9315
40	14-Jun-2025 08:22:40.147	-1.7634	0.8491	-0.9142	-2.6125
41	14-Jun-2025 08:22:40.197	0	-8.7043	-8.7043	8.7043

	TimeStamp	y1 = Sin1	y2 = Sin2	Y3 = y1 + y2	Y4 = y1 - y2
42	14-Jun-2025 08:22:40.247	1.7634	-14.9331	-13.1697	16.6964
43	14-Jun-2025 08:22:40.297	2.8532	-15.4579	-12.6047	18.3110
44	14-Jun-2025 08:22:40.347	2.8532	-10.0783	-7.2251	12.9315
45	14-Jun-2025 08:22:40.397	1.7634	-0.8491	0.9142	2.6125
46	14-Jun-2025 08:22:40.447	0	8.7043	8.7043	-8.7043
47	14-Jun-2025 08:22:40.497	-1.7634	14.9331	13.1697	-16.6964
48	14-Jun-2025 08:22:40.547	-2.8532	15.4579	12.6047	-18.3110
49	14-Jun-2025 08:22:40.597	-2.8532	10.0783	7.2251	-12.9315
50	14-Jun-2025 08:22:40.647	-1.7634	0.8491	-0.9142	-2.6125
51	14-Jun-2025 08:22:40.697	0	-8.7043	-8.7043	8.7043
52	14-Jun-2025 08:22:40.747	1.7634	-14.9331	-13.1697	16.6964
53	14-Jun-2025 08:22:40.797	2.8532	-15.4579	-12.6047	18.3110
54	14-Jun-2025 08:22:40.847	2.8532	-10.0783	-7.2251	12.9315
55	14-Jun-2025 08:22:40.897	1.7634	-0.8491	0.9142	2.6125
56	14-Jun-2025 08:22:40.947	0	8.7043	8.7043	-8.7043
57	14-Jun-2025 08:22:40.997	-1.7634	14.9331	13.1697	-16.6964
58	14-Jun-2025 08:22:41.047	-2.8532	15.4579	12.6047	-18.3110
59	14-Jun-2025 08:22:41.097	-2.8532	10.0783	7.2251	-12.9315
60	14-Jun-2025 08:22:41.147	-1.7634	0.8491	-0.9142	-2.6125
61	14-Jun-2025 08:22:41.197	0	-8.7043	-8.7043	8.7043
62	14-Jun-2025 08:22:41.247	1.7634	-14.9331	-13.1697	16.6964
63	14-Jun-2025 08:22:41.297	2.8532	-15.4579	-12.6047	18.3110
64	14-Jun-2025 08:22:41.347	2.8532	-10.0783	-7.2251	12.9315
65	14-Jun-2025 08:22:41.397	1.7634	-0.8491	0.9142	2.6125
66	14-Jun-2025 08:22:41.447	0	8.7043	8.7043	-8.7043
67	14-Jun-2025 08:22:41.497	-1.7634	14.9331	13.1697	-16.6964
68	14-Jun-2025 08:22:41.547	-2.8532	15.4579	12.6047	-18.3110
69	14-Jun-2025 08:22:41.597	-2.8532	10.0783	7.2251	-12.9315
70	14-Jun-2025 08:22:41.647	-1.7634	0.8491	-0.9142	-2.6125
71	14-Jun-2025 08:22:41.697	0	-8.7043	-8.7043	8.7043
72	14-Jun-2025 08:22:41.747	1.7634	-14.9331	-13.1697	16.6964
73	14-Jun-2025 08:22:41.797	2.8532	-15.4579	-12.6047	18.3110
74	14-Jun-2025 08:22:41.847	2.8532	-10.0783	-7.2251	12.9315

	TimeStamp	y1 = Sin1	y2 = Sin2	Y3 = y1 + y2	Y4 = y1 - y2
75	14-Jun-2025 08:22:41.897	1.7634	-0.8491	0.9142	2.6125
76	14-Jun-2025 08:22:41.947	0	8.7043	8.7043	-8.7043
77	14-Jun-2025 08:22:41.997	-1.7634	14.9331	13.1697	-16.6964
78	14-Jun-2025 08:22:42.047	-2.8532	15.4579	12.6047	-18.3110
79	14-Jun-2025 08:22:42.097	-2.8532	10.0783	7.2251	-12.9315
80	14-Jun-2025 08:22:42.147	-1.7634	0.8491	-0.9142	-2.6125
81	14-Jun-2025 08:22:42.197	0	-8.7043	-8.7043	8.7043
82	14-Jun-2025 08:22:42.247	1.7634	-14.9331	-13.1697	16.6964
83	14-Jun-2025 08:22:42.297	2.8532	-15.4579	-12.6047	18.3110
84	14-Jun-2025 08:22:42.347	2.8532	-10.0783	-7.2251	12.9315
85	14-Jun-2025 08:22:42.397	1.7634	-0.8491	0.9142	2.6125
86	14-Jun-2025 08:22:42.447	0	8.7043	8.7043	-8.7043
87	14-Jun-2025 08:22:42.497	-1.7634	14.9331	13.1697	-16.6964
88	14-Jun-2025 08:22:42.547	-2.8532	15.4579	12.6047	-18.3110
89	14-Jun-2025 08:22:42.597	-2.8532	10.0783	7.2251	-12.9315
90	14-Jun-2025 08:22:42.647	-1.7634	0.8491	-0.9142	-2.6125
91	14-Jun-2025 08:22:42.697	0	-8.7043	-8.7043	8.7043
92	14-Jun-2025 08:22:42.747	1.7634	-14.9331	-13.1697	16.6964
93	14-Jun-2025 08:22:42.797	2.8532	-15.4579	-12.6047	18.3110
94	14-Jun-2025 08:22:42.847	2.8532	-10.0783	-7.2251	12.9315
95	14-Jun-2025 08:22:42.897	1.7634	-0.8491	0.9142	2.6125
96	14-Jun-2025 08:22:42.947	0	8.7043	8.7043	-8.7043
97	14-Jun-2025 08:22:42.997	-1.7634	14.9331	13.1697	-16.6964
98	14-Jun-2025 08:22:43.047	-2.8532	15.4579	12.6047	-18.3110
99	14-Jun-2025 08:22:43.097	-2.8532	10.0783	7.2251	-12.9315
100	14-Jun-2025 08:22:43.147	-1.7634	0.8491	-0.9142	-2.6125

⋮

```
%Nombres de las variables
dataset.Properties.VariableNames
```

```
ans = 1×5 cell
'TimeStamp'  'y1 = Sin1'  'y2 = Sin2'  'Y3 = y1 + y2''Y4 = y1 - y2'
```

```
%cuantas columnas tiene el dataset
length(dataset.Properties.VariableNames)
```

```
ans = 5
```

```
%cuantas filas tiene el dataset
height(dataset) % pata Table no funcion el length
```

```
ans = 201
```

```
%cuantas filas tiene el dataset
size(dataset,1) % 1 para filas
```

```
ans = 201
```

```
%cuantas columnas tiene el dataset
size(dataset,2) % 2 para columnas
```

```
ans = 5
```

Paso 6: Guardar los carchivos csv en el computador

```
filename = 'dataset.csv';
fSave_dataset(filename,dataset)
%Limpiar workspace
clear
```

Paso 7: Leer archivos csv y retornar una tabla

```
rawData = fLoad_dataset('dataset.csv');
```

```
Warning: Column headers from the file were modified to make them valid MATLAB identifiers before creating
variable names for the table. The original column headers are saved in the VariableDescriptions property.
Set 'VariableNamingRule' to 'preserve' to use the original column headers as table variable names.
```

```
%muestra las x primera columnas
disp(rawData(1:10,:));
```

TimeStamp	y1_Sin1	y2_Sin2	Y3_Y1_Y2	Y4_Y1_Y2
14-Jun-2025 08:22:38.197	0	-8.7043	-8.7043	8.7043
14-Jun-2025 08:22:38.247	1.7634	-14.933	-13.17	16.696
14-Jun-2025 08:22:38.297	2.8532	-15.458	-12.605	18.311
14-Jun-2025 08:22:38.347	2.8532	-10.078	-7.2251	12.931
14-Jun-2025 08:22:38.397	1.7634	-0.84915	0.91421	2.6125
14-Jun-2025 08:22:38.447	0	8.7043	8.7043	-8.7043
14-Jun-2025 08:22:38.497	-1.7634	14.933	13.17	-16.696
14-Jun-2025 08:22:38.547	-2.8532	15.458	12.605	-18.311
14-Jun-2025 08:22:38.597	-2.8532	10.078	7.2251	-12.931
14-Jun-2025 08:22:38.647	-1.7634	0.84915	-0.91421	-2.6125

Paso 8: Extraer y graficar los datos cargados

```
rawData.Properties
```

```
ans =
  TableProperties with properties:
```

```
          Description: ''
             UserData: []
       DimensionNames: {'Row'  'Variables'}
        VariableNames: {'TimeStamp'  'y1_Sin1'  'y2_Sin2'  'Y3_Y1_Y2'  'Y4_Y1_Y2'}
  VariableDescriptions: {'TimeStamp'  'y1 = Sin1'  'y2 = Sin2'  'Y3 = y1 + y2'  'Y4 = y1 - y2'}
         VariableUnits: {}
    VariableContinuity: []
             RowNames: {}
    CustomProperties: No custom properties are set.
  Use addprop and rmprop to modify CustomProperties.
```

```
t = datetime(rawData.TimeStamp);
y1 = rawData.y1_Sin1;
y2 = rawData.y2_Sin2;
y3 = rawData.Y3_Y1_Y2;
y4 = rawData.Y4_Y1_Y2;

figure;
plot(t,y1); hold on;
plot(t,y2);
plot(t,y3);
plot(t,y4);

legend('y1 = Sin1', 'y2 = Sin2', 'Y3 = y1 + y2', 'Y4 = y1 - y2');
xlabel('Tiempo');
ylabel('Valores');
title('Señales en función del tiempo');
grid on;
```