

# PROPUESTA DE **PROYECTO**

*Presentación realizada por Irene Arrabé*



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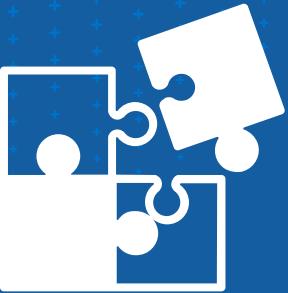
05

Resultados  
elegidos

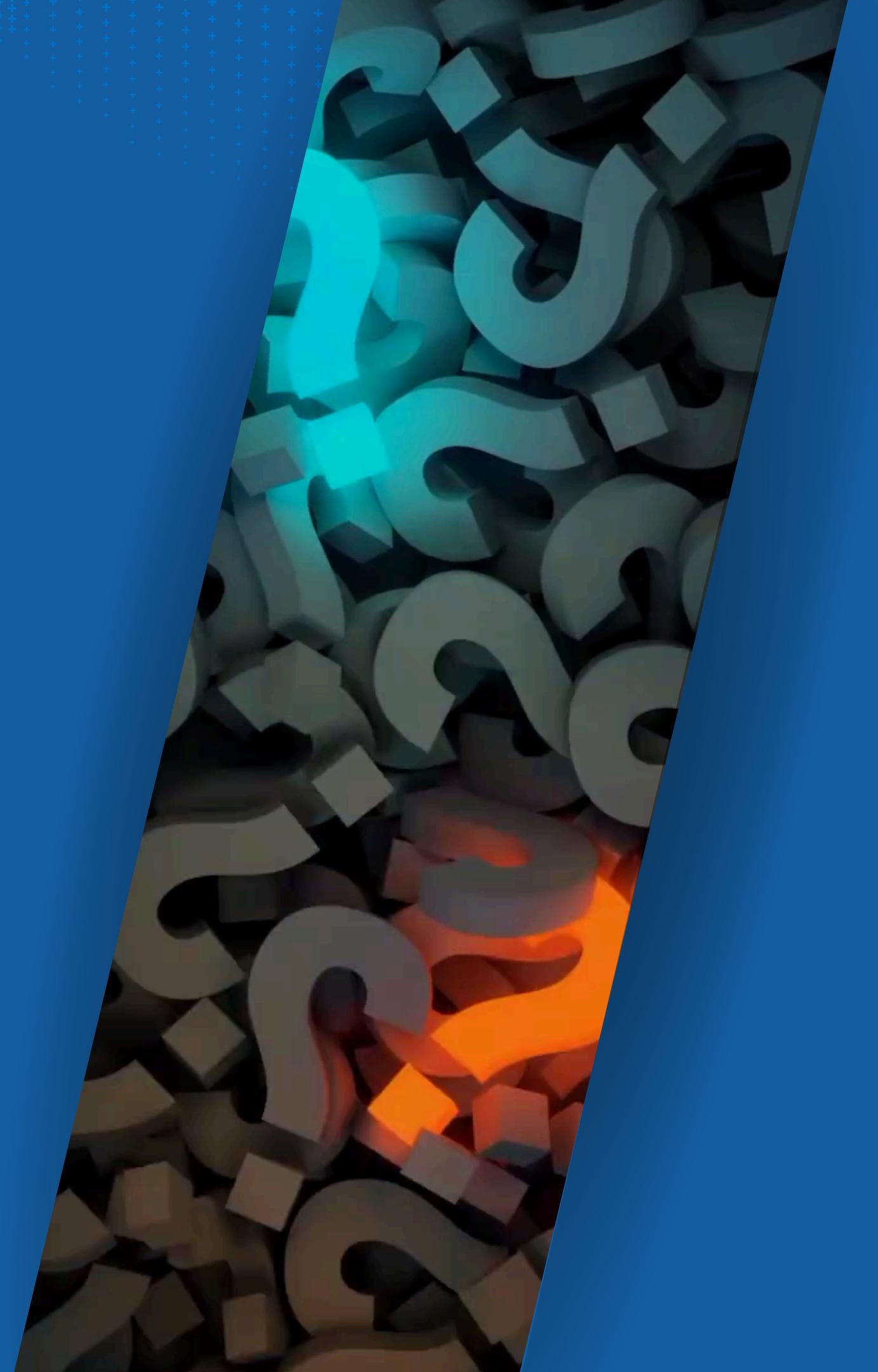
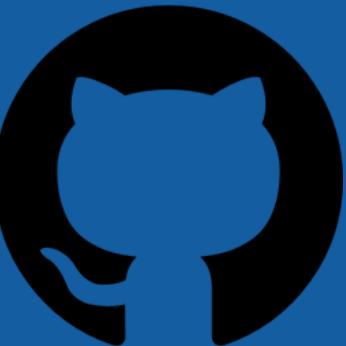
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Creación de  
la app

# PROBLEMA



Crear un sistema preciso y  
automatizado para  
recomendaciones de salud  
física.



# OBJETIVOS

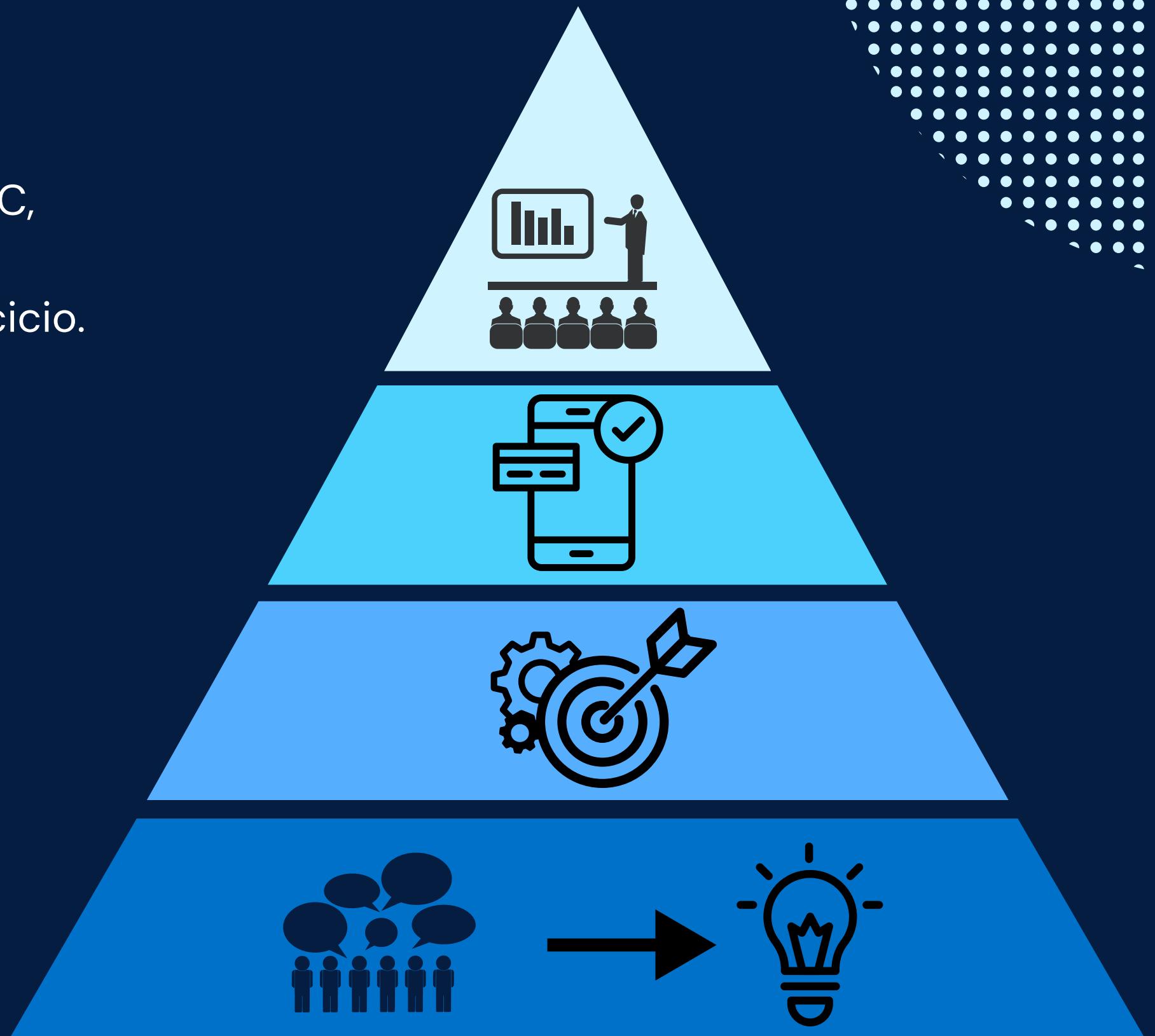
Aplicación basada en ML para calcular IMC, estimar porcentaje de grasa corporal y calorías quemadas en una sesión de ejercicio.

**01** Generar la idea

**02** Conseguir un modelo que nos de los resultados esperados

**03** Crear una app eficiente y accesible

**04** Plantear mejoras futuras



# TRATAMIENTO DE LOS DATOS



- Limpia de datos
- one-hot encoding
- label encoding
- Creación de nuevas columnas

Prueba de modelos supervisados y no supervisados:

- RandomForest
- Polinomico
- LinerRegressor
- PCA
- Keras
- Ridge

## Feature Engineering

## Análisis

## Modelos

## Resultados

Estudio de la relación entre las variables y elección de las más relevantes

Elección del modelo que mejores aproximaciones haga

# Datasets

## CLASIFICACIÓN

Age  
Gender  
Height  
Weight  
CALC  
FAVC  
FCVC  
NCP  
SCC  
SMOKE  
CH2O  
**family\_history\_with\_overweight**  
FAF  
TUE  
CAEC  
MTRANS  
**NObeyesdad**  
**BMI**

## KCAL QUEMADAS

Age  
Gender  
Weight (kg)  
Height (m)  
Max\_BPM  
Avg\_BPM  
Resting\_BPM  
**Session\_Duration (hours)**  
**Calories\_Burned**  
**Workout\_Type**  
**Fat\_Percentage**  
Water\_Intake (liters)  
**Workout\_Frequency**  
**Experience\_Level**  
**BMI**

- ORIGEN: kaggle

Correlation matrix heatmap showing relationships between various variables. The matrix is color-coded by correlation strength, ranging from -1.0 (dark blue) to 1.0 (dark red). A red box highlights the variable 'NObeyesdad'. A green box highlights the variable 'family\_with\_overweight'. A green dashed box highlights the first six rows. A green circle highlights the cell for 'NObeyesdad' at row 2, column 4. A red circle highlights the cell for 'NObeyesdad' at row 2, column 5. A red dashed box highlights 'Male' and 'BMI'.

	TUE	0.30	0.05	-0.07	-0.10	0.04	0.01	0.06				
<b>NObeyesdad</b>	-0.16	0.09	<b>0.81</b>	0.25	0.07	0.09	-0.15	-0.11				
<b>Male</b>	-0.05	0.62	<b>0.16</b>	-0.27	0.07	0.11	0.19	0.02	-0.07			
<b>BMI</b>	0.23	0.13	<b>0.93</b>	0.26	0.04	0.14	-0.18	-0.10	<b>0.87</b>	-0.05		
<b>family_with_overweight</b>	-0.20	0.25	<b>0.50</b>	0.04	0.07	0.15	-0.06	<b>0.02</b>	<b>0.36</b>	0.10	0.48	
<b>Alcohol</b>	-0.04	0.13	0.21	0.06	0.07	0.09	-0.09	-0.05	<b>0.17</b>	-0.01	0.17	-0.01
<b>Andar_bici</b>	-0.05	0.04	-0.10	0.00	0.01	0.02	0.13	0.06	-0.06	0.06	-0.13	0.00
<b>Picoteo</b>	-0.06	0.10	0.11	0.10	0.15	-0.16	-0.02	0.11	0.08	-0.06	0.08	0.00
<b>Fumador</b>	0.10	0.06	0.03	0.01	0.01	-0.03	0.01	0.02	<b>0.03</b>	0.04	-0.00	0.00
<b>Control_kcal</b>	-0.11	-0.13	-0.20	0.07	-0.02	0.01	0.07	-0.01	-0.13	-0.10	-0.18	0.00
<b>FastFood</b>	-0.06	0.18	0.27	-0.03	-0.01	0.01	-0.11	0.07	<b>0.24</b>	0.06	0.25	0.00
	<b>TUE</b>									<b>NObeyesdad</b>		
		<b>Age</b>	<b>Height</b>	<b>Weight</b>	<b>FCVC</b>	<b>NCP</b>	<b>CH2O</b>	<b>FAF</b>	<b>TUE</b>	<b>NObeyesdad</b>	<b>Male</b>	<b>BMI</b>

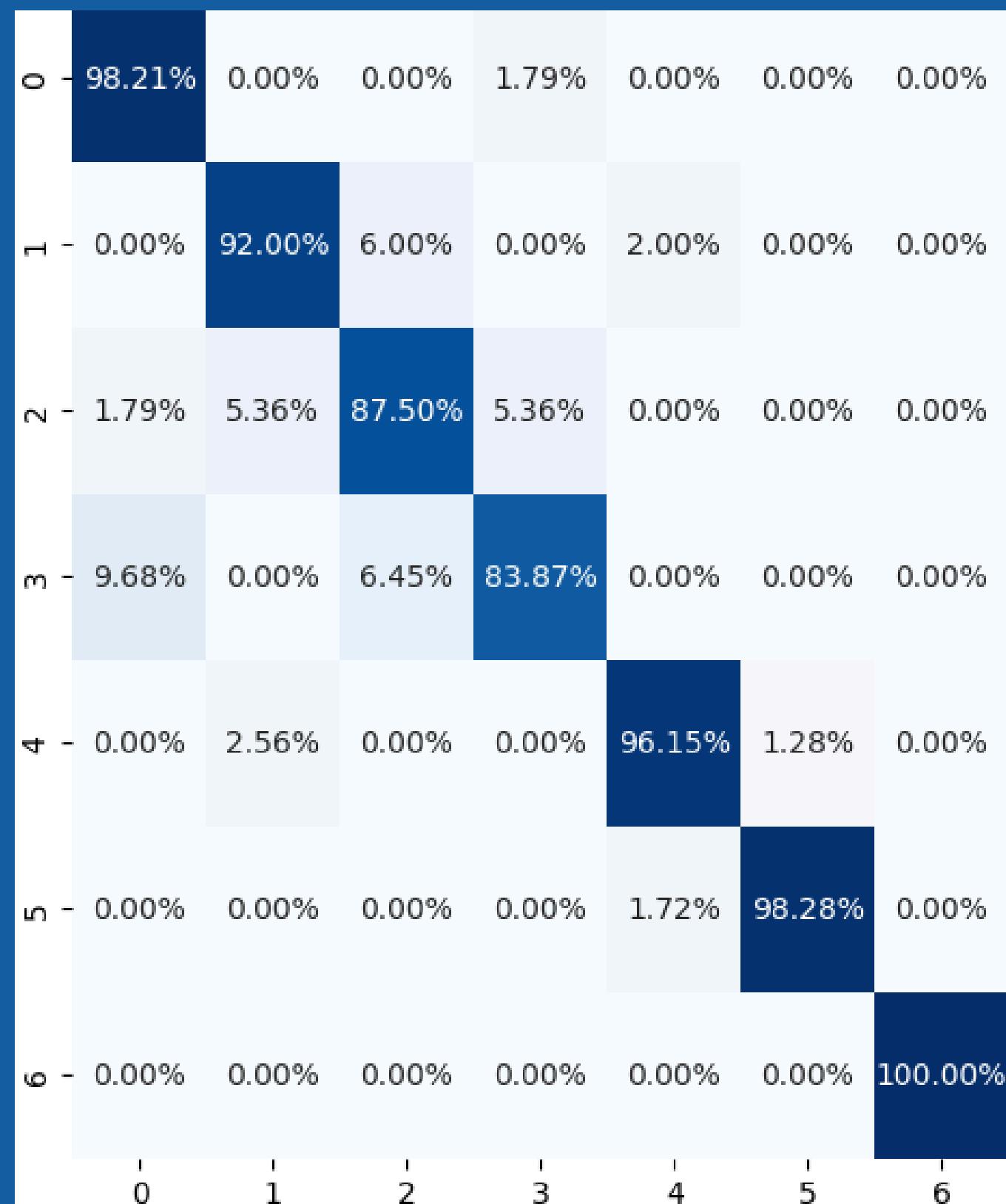


# MODELOS

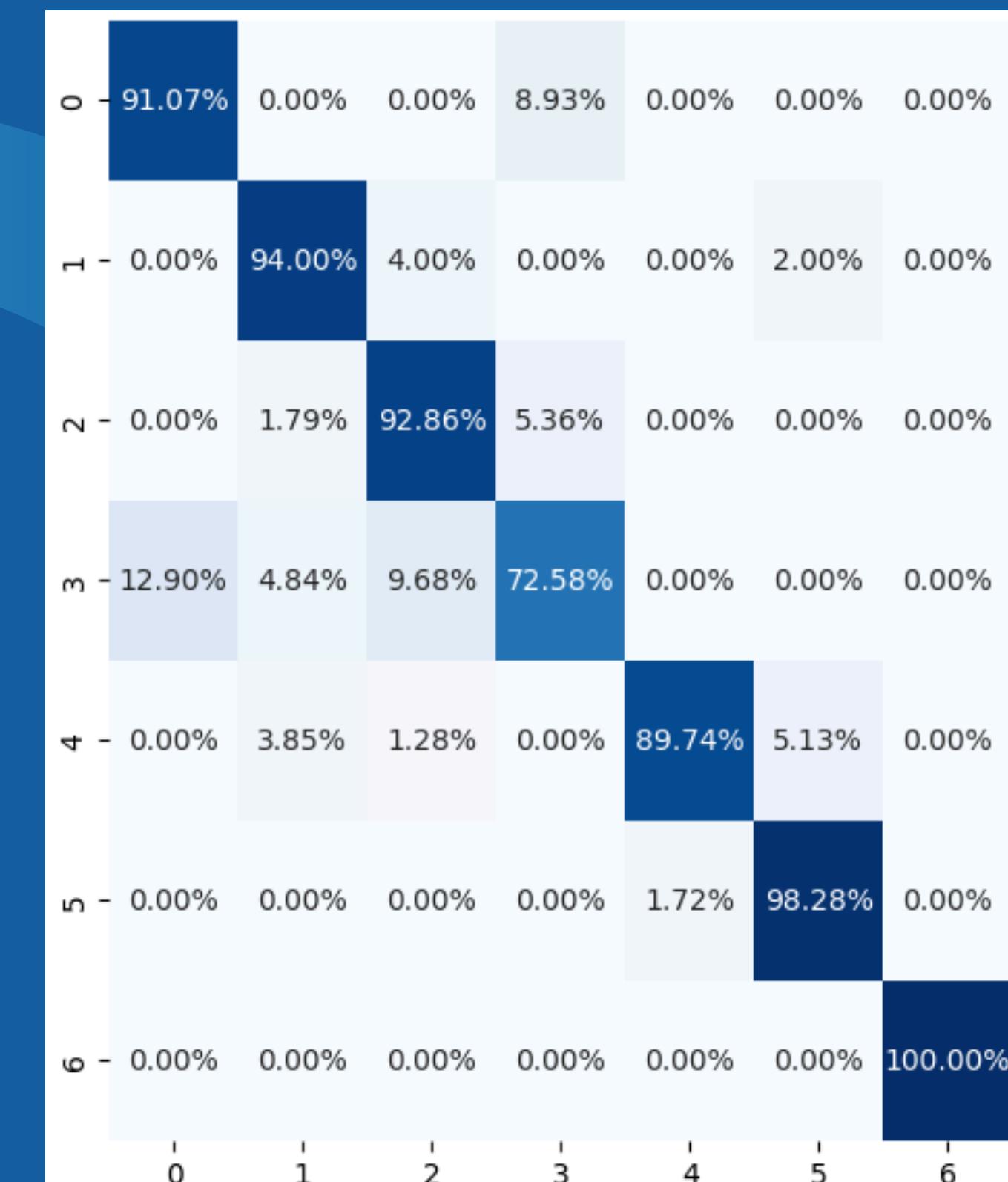
1. Clasificación
2. Regresión



## Redes Neuronales



## RandomForestClassifier



# RESULTADOS DE LAS PREDICCIONES

# Redes Neuronales

# RandomForest

# RESULTADOS DE LAS PREDICCIONES

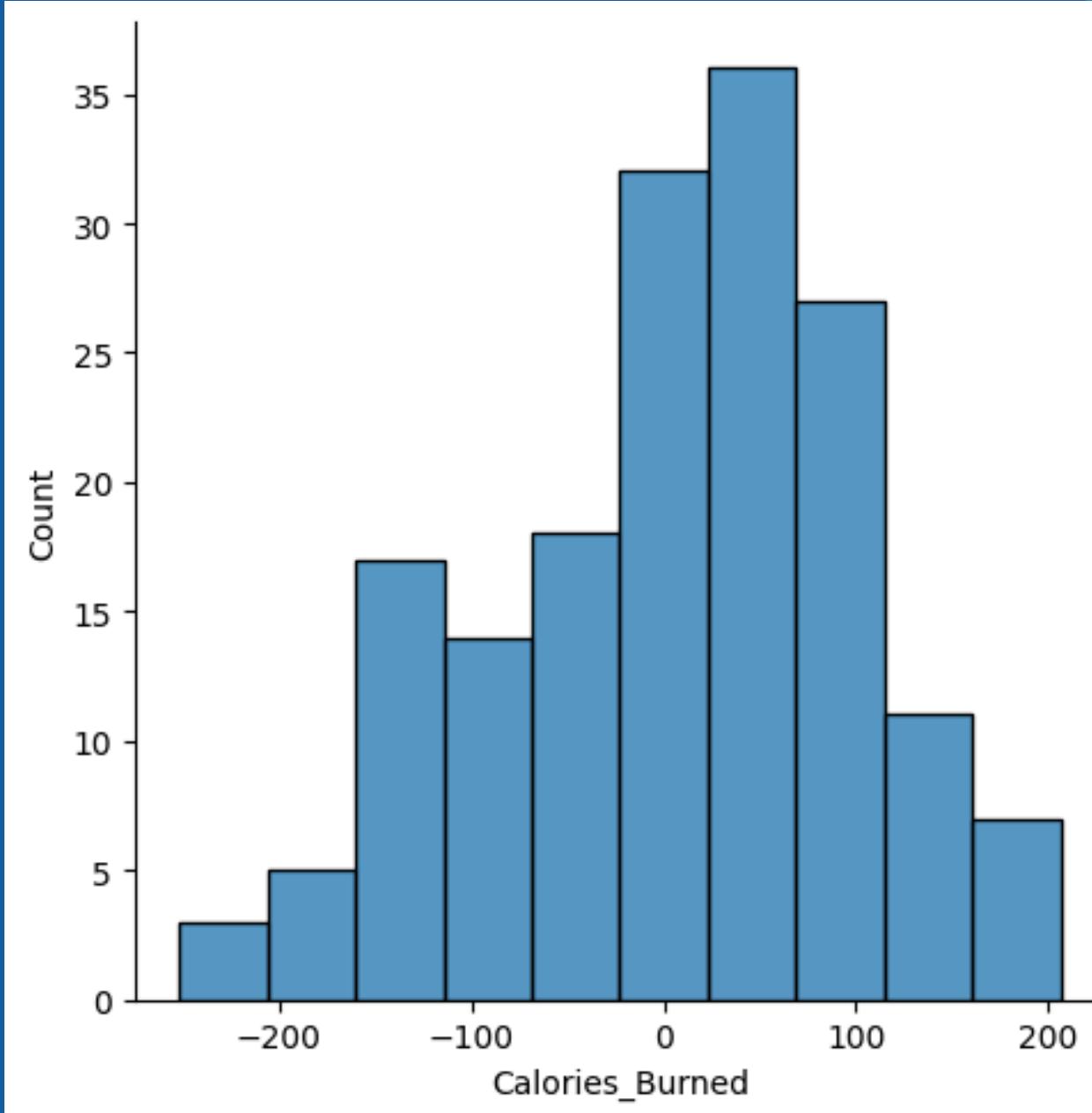
## Redes Neuronales

	precision	recall	f1-score
0	0.89	0.98	0.93
1	0.90	0.92	0.91
2	0.88	0.88	0.88
3	0.93	0.84	0.88
4	0.97	0.96	0.97
5	0.98	0.98	0.98
6	1.00	1.00	1.00
accuracy			0.94

## RandomForest

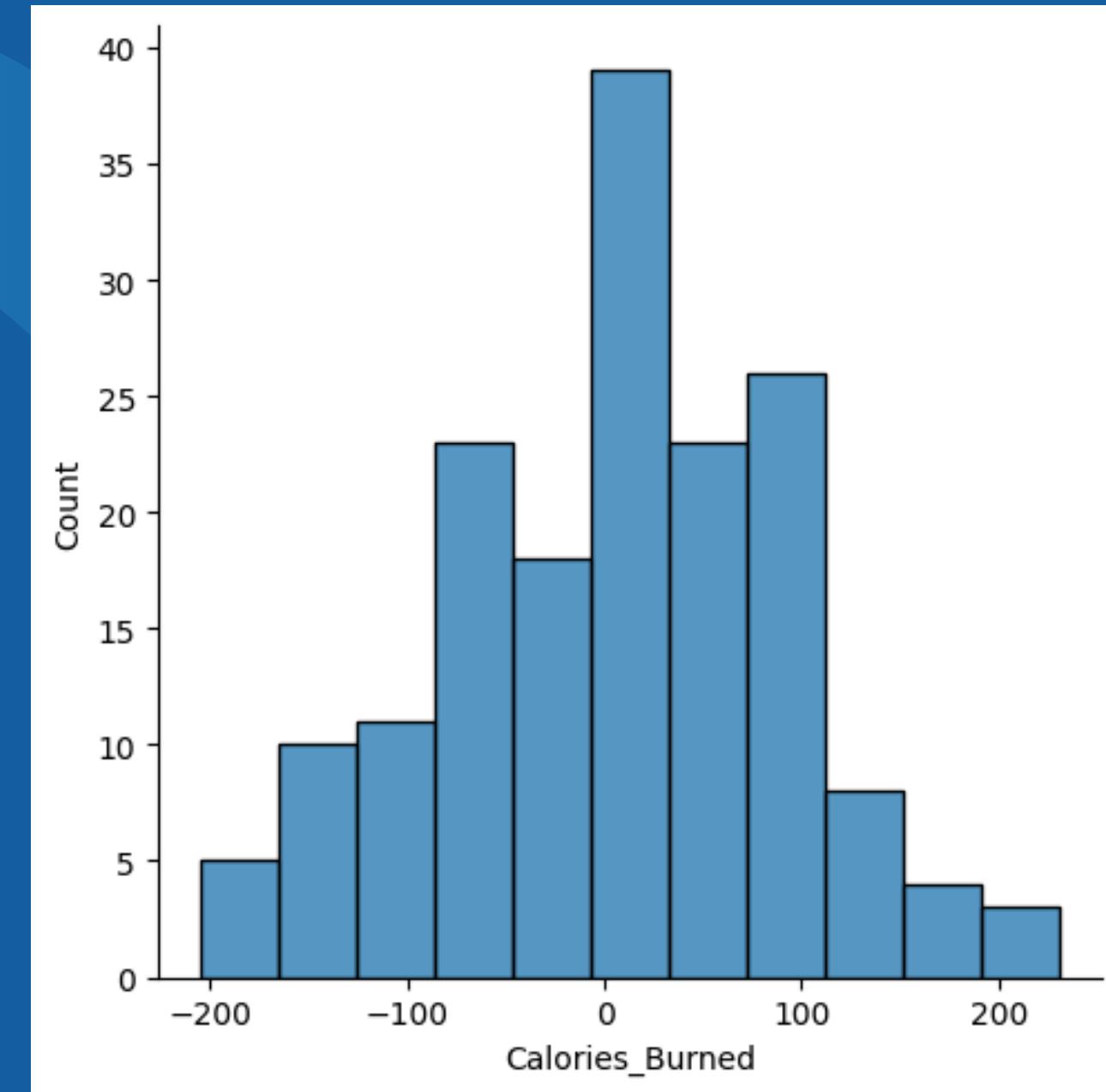
	precision	recall	f1-score
0	0.86	0.91	0.89
1	0.87	0.94	0.90
2	0.85	0.93	0.89
3	0.85	0.73	0.78
4	0.99	0.90	0.94
5	0.92	0.98	0.95
6	1.00	1.00	1.00
accuracy			0.91

## RandomForestRegressor



R2 score 0.8648127440459994  
R2 score train 0.9197284739778846  
MAE 79.00778240629157

## PolynomialFeatures (degree=2)



R2 score 0.89325012398219960189  
R2 score train 0.8825634354384349  
MAE 68.94984126559174

# RESULTADOS DE LAS PREDICCIONES

RandomForest

	kcal	Kcal_real
8	496.0	454.0
9	1118.0	1107.0
10	737.0	576.0
11	507.0	433.0
12	997.0	911.0
13	1010.0	864.0
14	733.0	621.0

MAE: 88.28 kcal

RMSE: 109.79 kcal

R<sup>2</sup> Score: 0.85

Polynomial\_2

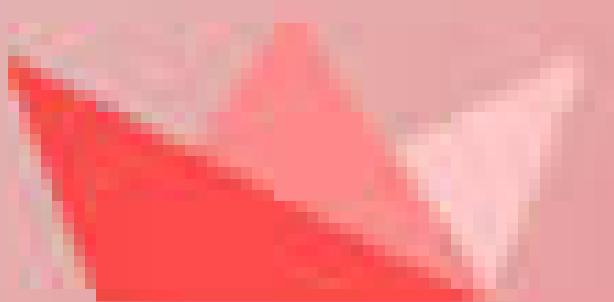
	kcal	Kcal_real
8	441.0	454.0
9	1148.0	1107.0
10	699.0	576.0
11	507.0	433.0
12	1015.0	911.0
13	994.0	864.0
14	693.0	621.0

MAE: 85.37 kcal

RMSE: 107.15 kcal

R<sup>2</sup> Score: 0.86

# CREACIÓN DE LA APP



Streamlit

# Proceso

- 1.- Cargar los modelos**
- 2.- Diseñar la app**
- 3.- Pedir los datos al usuario**
- 4.- Hacer un llamado a las funciones y modelos predefinidos para obtener los resultados**

*my healthy  
maki*

