

Artificial Intelligence Projects

The objective of the projects is to prepare you to apply different machine learning algorithms to real-world tasks. This will help you to increase your knowledge about the workflow of the machine learning tasks. You will learn how to clean your data, applying pre-processing, feature engineering, classification methods.

- Registration ends: 3/12/2022.
- Registration link: [Link](#)
- Kaggle Competition: [Link](#)
- Delivering: 15/12/2022
- Minimum number of members in team is 4 and maximum is 6
- You must deliver a detailed report for the project contains all your work (Preprocessing, algorithms used in the module and the achieved accuracy).

Note: Report will be graded

In the project, you will apply the followings: -

Preprocessing: Before building your models, you need to make sure that the dataset is clean and ready-to-use.

Classification:

- Train at least 3 models to classify each sample into distinct classes.
- Choose at least two hyperparameters to vary. Study at least three different choices for each hyperparameter. When varying one hyperparameter, all the other hyperparameters can be fixed.
- Train and evaluate your classifiers on your validation set.

Project Report Must Include:

- You must explain in detail the **preprocessing techniques** you needed to apply on your dataset and how you implemented them.
- Perform **analysis** on the dataset as studied and explain how the features affect and relate to each other.
- Explain what the **sizes** of your training and validation sets and the accuracy of each model.
- Mention any further techniques that were used to **improve** the results (if exist).
- Finally, write a conclusion.

Project (1): Employee Salary Prediction

Employee salary depends on multiple features such as education, native country, occupation, race, and somemore.

The goal of the Project is to:

- Predict employee salary based on the given features.

Dataset Snapshot

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	age	work-class	work-fnl	education	education-num	marital-status	position	relationship	race	sex	capital-gain	capital-loss	hours-per-week	native-country	salary
2	39	State-gov	77516	Bachelors	13	Never-married	Adm-clerical	Not-in-family	White	Male	2174	0	40	United-States	<=50K
3	50	Self-emp-not-inc	83311	Bachelors	13	Married-civ-spouse	Exec-managerial	Husband	White	Male	0	0	13	United-States	<=50K
4	38	Private	215646	HS-grad	9	Divorced	Handlers-cleaner	Not-in-family	White	Male	0	0	40	United-States	<=50K
5	53	Private	234721	11th	7	Married-civ-spouse	Handlers-cleaner	Husband	Black	Male	0	0	40	United-States	<=50K
6	28	Private	338409	Bachelors	13	Married-civ-spouse	Prof-specialty	Wife	Black	Female	0	0	40	Cuba	<=50K
7	37	Private	284582	Masters	14	Married-civ-spouse	Exec-managerial	Wife	White	Female	0	0	40	United-States	<=50K
8	49	Private	160187	9th	5	Married-spouse-at	Other-service	Not-in-family	Black	Female	0	0	16	Jamaica	<=50K
9	52	Self-emp-not-inc	209642	HS-grad	9	Married-civ-spouse	Exec-managerial	Husband	White	Male	0	0	45	United-States	>50K
10	31	Private	45781	Masters	14	Never-married	Prof-specialty	Not-in-family	White	Female	14084	0	50	United-States	>50K
11	42	Private	159449	Bachelors	13	Married-civ-spouse	Exec-managerial	Husband	White	Male	5178	0	40	United-States	>50K
12	37	Private	280464	Some-colleg	10	Married-civ-spouse	Exec-managerial	Husband	Black	Male	0	0	80	United-States	>50K
13	30	State-gov	141297	Bachelors	13	Married-civ-spouse	Prof-specialty	Husband	Asian-Pac	Male	0	0	40	India	>50K
14	23	Private	122272	Bachelors	13	Never-married	Adm-clerical	Own-child	White	Female	0	0	30	United-States	<=50K
15	32	Private	205019	Assoc-acdm	12	Never-married	Sales	Not-in-family	Black	Male	0	0	50	United-States	<=50K
16	40	Private	121772	Assoc-voc	11	Married-civ-spouse	Craft-repair	Husband	Asian-Pac	Male	0	0	40	?	>50K
17	34	Private	245487	7th-8th	4	Married-civ-spouse	Transport-moving	Husband	Amer-Indi	Male	0	0	45	Mexico	<=50K
18	25	Self-emp-not-inc	176756	HS-grad	9	Never-married	Farming-fishing	Own-child	White	Male	0	0	35	United-States	<=50K
19	32	Private	186824	HS-grad	9	Never-married	Machine-op-insp	Unmarried	White	Male	0	0	40	United-States	<=50K
20	38	Private	28887	11th	7	Married-civ-spouse	Sales	Husband	White	Male	0	0	50	United-States	<=50K
21	43	Self-emp-not-inc	292175	Masters	14	Divorced	Exec-managerial	Unmarried	White	Female	0	0	45	United-States	>50K
22	40	Private	193524	Doctorate	16	Married-civ-spouse	Prof-specialty	Husband	White	Male	0	0	60	United-States	>50K
23	54	Private	302146	HS-grad	9	Separated	Other-service	Unmarried	Black	Female	0	0	20	United-States	<=50K
24	35	Federal-gov	76845	9th	5	Married-civ-spouse	Farming-fishing	Husband	Black	Male	0	0	40	United-States	<=50K
25	43	Private	117037	11th	7	Married-civ-spouse	Transport-moving	Husband	White	Male	0	2042	40	United-States	<=50K

Dataset : [Link](#)