Plan Generator

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1 - General

The main goal of Plan Generator is to calculate the plan for an annuity loan of the borrower and inform monthly installment, consisting of principal and interest repayments.

The annuity amount has to be derived from three of the input parameters (duration, nominal interest rate, total loan amount) before starting the plan calculation.

Example Loan Details after annuity calculation:

Loan Amount	5000 €
Nominal Interest Rate	5.00 %
Duration	2 years
Annuity	219.36 €
Start-Date	01.01.2018

Based on this information we are able to create a repayment plan for the borrower:

Date	Annuity (Borrower Payment Amount)	Principal	Interest	Initial Outstanding Principal	Remaining Outstanding Principal
01.01.2018	219.36 €	198.53 €	20.83 €	5000 €	4801.47 €
01.02.2018	219.36 €	199.35	20.01 €	4801.47 €	4602.12 €
...	...	...	...	...	...
01.12.2019	219.28 €	218.37 €	0.91 €	218.37 €	0 €

The calculation will be process as below :

- For simplicity, we will have the following day convention: each month has 30 days, a year has 360 days.
- Interest calculation; Interest = (Nominal-Rate * Days in Month * Initial Outstanding Principal) / days in year e.g. first installment Interest = (5.00 * 30 * 5000 / 360) = 2083.33333333 cents
- Principal = Annuity - Interest (if, calculated interest amount exceeds the initial outstanding principal amount, take initial outstanding principal amount instead)
- Borrower Payment Amount (Annuity) = Principal + Interest.

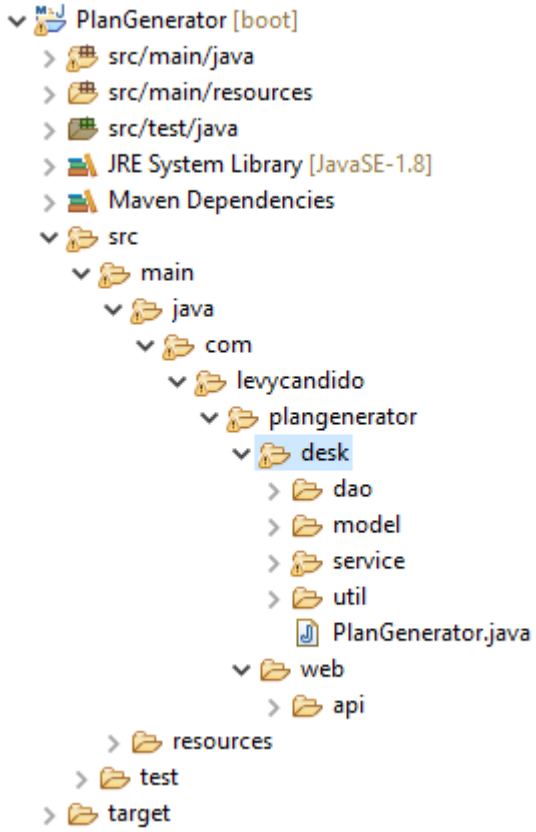
The result can be demonstrated through CSV or JSON file returned by a Rest API.

2 - Architecture

Plan Generator is constituted by two applications as described as below:

- **Desktop Application** - A desktop application receive the loan parameters in a input dialogue and create an .CSV file in a folder selected by the user

- **API application** - An Rest API application that is responsible to obtain a POST request from the user and return a JSON with the plan generator information.

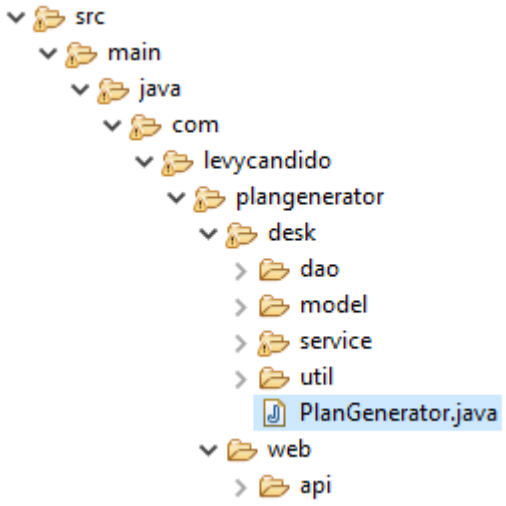


3- Instruction Guide

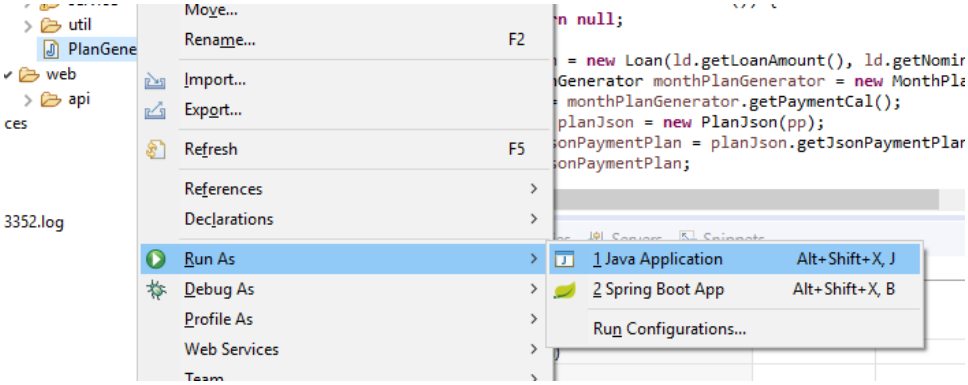
follow the steps below to execute the application:

3.1 - Desktop Application

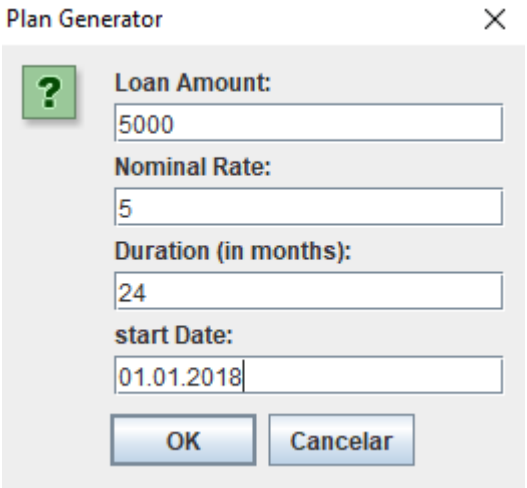
- Select PlanGenerator file as image below.



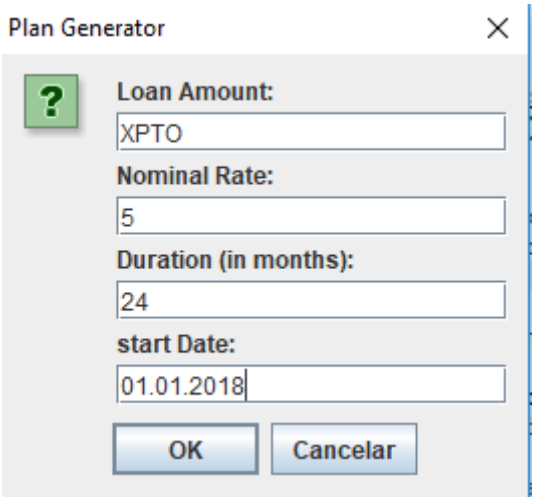
- Clicking with a right button on the PlanGenerator class, Run the file as Java Application.

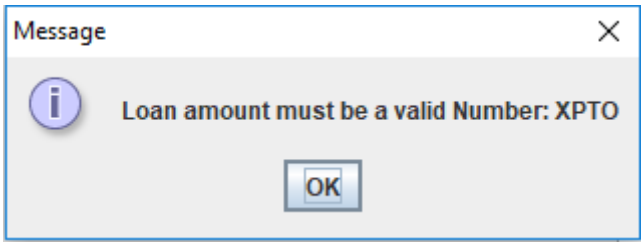


- The parameters dialog will be open to the user, fill out all fields.

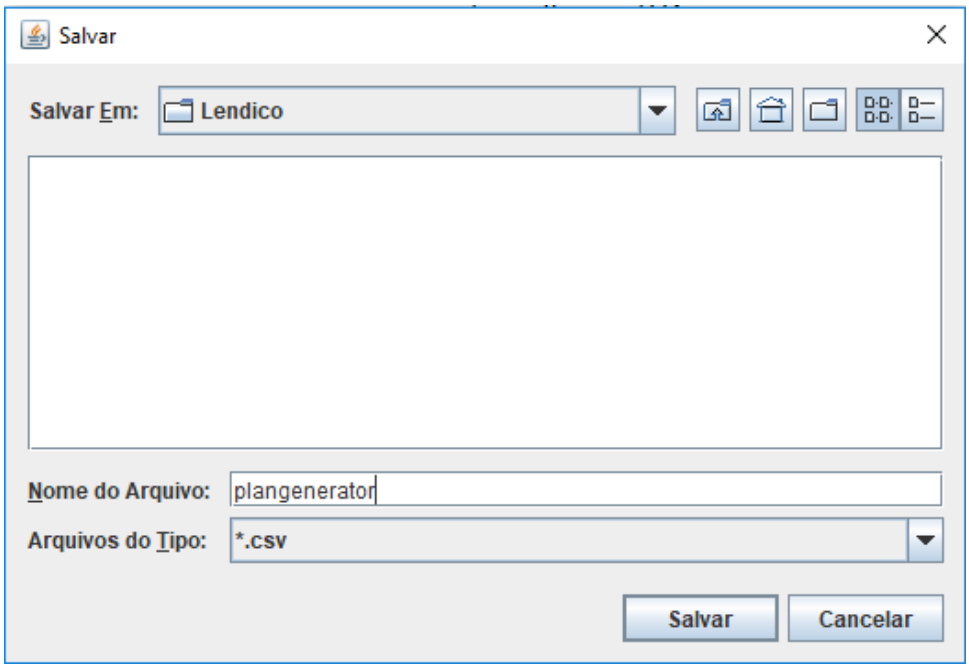


- If any inputted data is not valid an error message will be show to the user



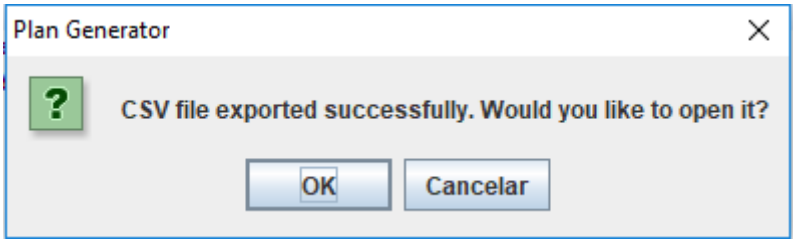


- If all input date is valid a showConfirmDialog will be open for the user to choose a name / folder of csv output file.

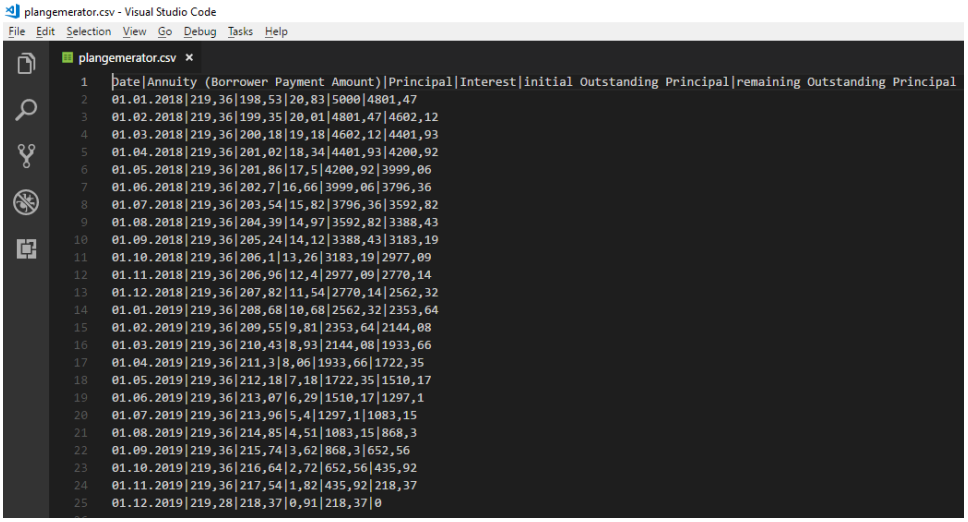


*If the user name a file with a extension different than .csv the application will change the extension automatically to csv.

- Plan Generator application will calculate the installments. After the processes finish a new dialog message will be displayed to the user asking if the user want to open the new csv file created.



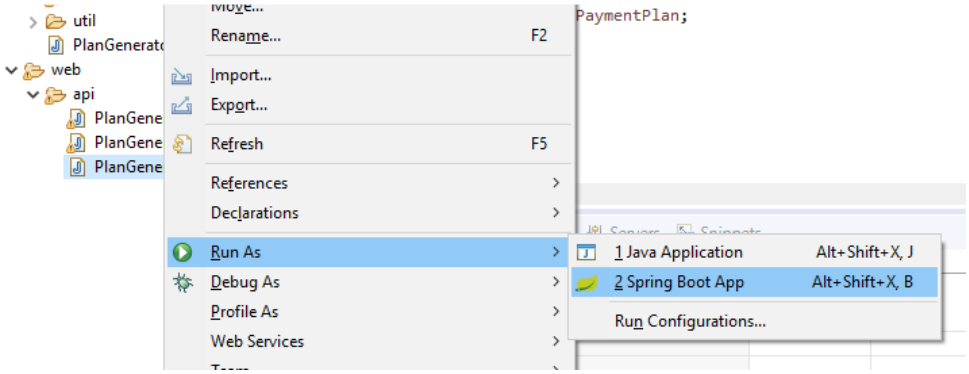
- In case of the user opts for open the new .csv file (formatted as required) it will be displayed on his screen, otherwise the application will finish.



3.1 - REST API Application

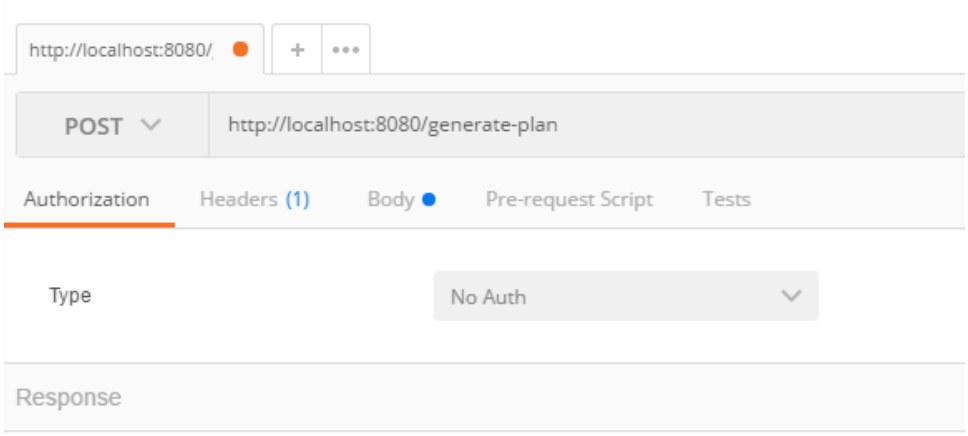
Following the steps below to consume the Rest API:

- Select PlanGenerator file:

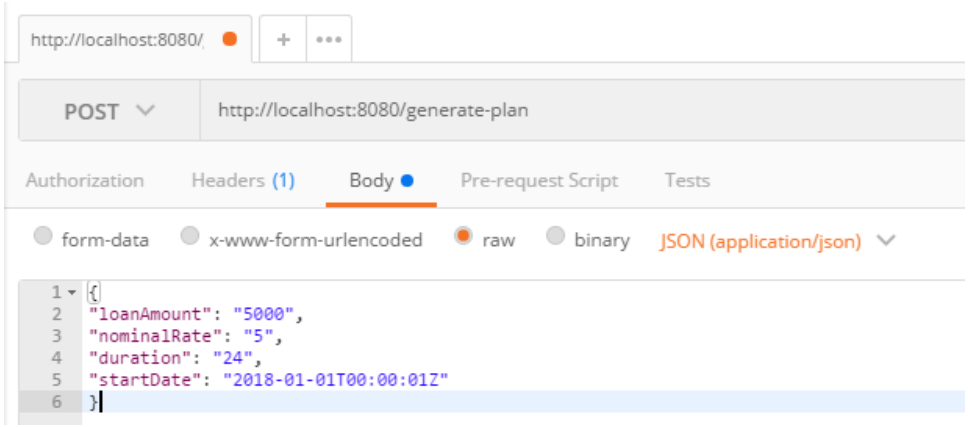


- Clicking with a right button run the PlanGeneratorWeb class as Java Spring Boot App.

- In your preferred API development environment creat create a new POST request to the endpoint: http://localhost:8080/generate-plan



- In the Body session please insert the payload as suggested on the test description:



- Clicking in Send the Plan Generator will be received as a JSON as below: