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Contents

Amortization schedule

An amortization schedule is a table detailing each periodic payment on an amortizing loan.

Amortization refers to the process of paying off a debt (often from a loan or mortgage) over time through regular payments. A portion of each payment is for interest while the remaining amount is applied towards the principal balance. The percentage of interest versus principal in each payment is determined in an amortization schedule. The schedule differentiates the portion of payment that belongs to interest expense from the portion used to close the gap of a discount or premium from the principal after each payment.

The following paragraphs explore three different types of debt amortization plan: amortization of a debt in arrears, amortization of a debt in advance installments, amortization of a debt in constant installments. Finally a script made using the matlab program is explained. Thanks to the proposed script, by entering the necessary data, it is possible to view the amortization plan and a graph that explains the trend of the variables used.

The purpose of this short paper is to provide a more flexible amortization schedule so that the user can choose whether he prefers to pay the installments in advance or in arrears and if there are periods in which he wants to pay installments with a higher amount than others periods.

Amortization of a debt in arrears

In the amortization of a debt in deferred installments, the payments of the borrower (the Rk installments) are made at the end of each period.
In deferred installment depreciation we have $R_0 = 0$ and each installment R_k is the sum of an interest portion Ik and a principal portion Ck.
$R_k = C_k + I_k \qquad with\ k = 1,2, \ldots, n$
The discounting of the installments must satisfy the constraint of financial equivalence between the lender's performance and the borrower's set of services.

$$S = \sum_{k=1}^{n} (1+i)^{-k}$$

The shares of capital Ck must satisfy the closing constraint.

$$S = \sum_{k=1}^{n} Ck$$

The residual debt is

$$D_k = S - \sum_{j=1}^{k} Cj.$$

Obviously $D_0 = S$
The interest portion is calculated on the basis of the residual debt D_{k-1}, outstanding at the beginning of the period.

$$Ik = D_{k-1}\mathrm{i} \qquad \text{with } \mathrm{k} = 1,2,3, \ldots, \mathrm{n}$$

From the equations seen we obtain a system of equations.

$$D_k = D_{k-1} - C_k$$
$$I_k = iD_{k-1}$$
$$R_k = C_k + I_k$$

Amortization of a debt in advance instalments

In the amortization of a debt in advance installments, the installment Rk is paid at the beginning of the period.
Therefore, in advance installment payments we have Rn = 0 while each installment from R0 to Rn-1 is the sum of a share of interest Ik and a capital share Ck.

$$Rk = Ck + Ik$$

Financial equivalence requires that the installments satisfy the relationship

$$S = \sum_{k=0}^{n-1} Rk\,(1+i)^{-k}$$

In financial practice it is usual to evaluate the residual debt immediately before the payment of the installments due.
We denote D_k^- the debt valued immediately before epoch k.

$$D_k^- = S - \sum_{j=0}^{k-1} Cj$$

D_k^- coincides with the residual debt calculated immediately after the payment of the installment that expires at the time k-1, D_{k-1}

$$D_k^- = D_{k-1}$$

The sum that the debtor actually receives at the time t = 0, after deducting the first installment that expires when he receives the loan is

$$S - R_0.$$

In this type of debt amortization, interest is paid at the beginning of the period. The Ik interest rate is equal to

$$I_k = D_k i(1+i)^{-1} = \left(\frac{i}{1+i}\right) D_k = dD_k$$

From the equations seen we obtain a system of equations.

$$\begin{gathered} D_{k+1} = D_k^- - C_k \\ I_k = dD_{k+1}^- \\ R_k = C_k + I_k \end{gathered}$$

Amortization of a debt in constant instalments

Another type of debt amortization is deferred straight-line amortization, also called French amortization.
The sum S which at time t = 0 passes from the creditor to the debtor can be understood as the present value of an annuity with constant deferred installments of amount R.
Financial equivalence requires that the relationship be valid for the instalments

$$S = \sum_{k=1}^{n} R(1+i)^{-k}$$

From this equation we obtain the amount of the instalment

$$R_k = R = \frac{S}{(1+i)^{-k}}$$

French amortization is characterized by increasing shares of capital in geometric progression in a ratio (1 + i), therefore between two successive shares of capital the relationship

$$\frac{C_k}{C_{k-1}} = 1 + i$$

It is sufficient to find an expression for C1 to also calculate all the other shares of capital. We use the closing condition on the equity shares

$$S = \sum_{k=1}^{n} Ck$$

$$\sum_{k=1}^{n} Ck = C_1 \sum_{k=1}^{n} (1+i)^{k-1}$$

hence

$$S = C_1 \sum_{k=1}^{n} (1+i)^{k-1}$$

$$C_1 = \frac{S}{\sum_{k=1}^{n} (1+i)^{k-1}} = \frac{S}{(1+i)^{-k}} (1+i)^{-n} = R(1+i)^{-n}$$

$$C_k = R(1+i)^{-(n-k+1)}$$

The script

In this phase all parts of the script are illustrated. This script allows us to find the amortization schedule simply by entering the necessary data. It is also possible to choose if you want an amortization plan with the installments advance or deferred and if you want the installment to be constant or in a proportion that you can choose.

If you want to run the script again to create a new amortization plan it is advisable to write "clear" on the matlab Command Window otherwise the new data can be contaminated by those used previously.

In the script, you are asked to enter the data first. So, we will have seven variables:

- S is the amount of the loan;
- installment tells us if the installments are in advance or if they are deferred;
- n is the total number of installments;
- r is the annual interest rate;
- t indicates the number of installments in a year;
- i tells us if the amount of the installments is constant.

Initially using the while loop checks for typos for both the installment variable and the i variable. If there is any error, the question is re-proposed indicating that a typo had previously occurred.

The interest rate per period (ix) is calculated using the following formula

$$ix = (1+r)^{\frac{1}{t}} - 1$$

Then i use the if command to take care only of the installments in advance.

I use the if command again to divide the cases in which you want to calculate a constant installment from the case in which you prefer to choose the proportion of the installment amount.

Then the formulas are used first to find the amount of the installment in the event of an advanced payment and of a constant amount.

To find the installment, we equal the initial loan amount (S) with the sum of the current payment values, so we have

$$S = \sum_{z=1}^{n} R(1+i)^{-z}$$

$$R = \frac{S}{\sum_{z=1}^{n}(1+i)^{-z}}$$

In the script I use the for loop to do the summation.

In this way we have found the amount of the installment and thanks to the disp command we show the user the result obtained.

Using the elseif command we now deal with the installment in the event of an advances payment with a not necessary constant amount

You are asked to indicate the proportion of the amount of an installment compared to the others, some examples are also given so that the question is as clear as possible.

Then the user by entering the proportion allows us to update the installments in a similar way to what was done previously. The proportion, p, entered by the user is multiplied by the actual values of the payments

$$R = \frac{S}{\sum_{z=1}^{n} p(1+i)^{-z}}$$

In the script, the variable inst and installment is used instead of the variable p and as we did previously, the for loop is used to do the summary.

The disp command show the user the result obtained.

We have calculated the installments so it is time to calculate the amortization schedule.

For each installment we must find the capital stock (CK), the interest (Ik) and the remaining debt (DK) for every period.

We calculate the installment by multiplying the installment (R) by the proportion of the installment arrayinst (k), in case the installments are constant all the installments are multiplied by 1.

$$Rk_k = arrayinst_k * R$$

Now I find the remaining debt on which we calculate the interest. To calculate the remaining debt, we obtain this formula from two formulas seen in the paragraph concerning the amortization of a debt in advance instalments.

$$DK_{k+1} = (DK_k - RK_{k+1})(1+ix)$$

We calcolate the interest rate when the installments are in advance and the interest

$$id = \frac{ix}{1+ix}$$

$$Ik_k = DK_k^- * id$$

And we find the amount of capital paid (Ck)

$$CK_k = RK_k - Ik_k$$

Thanks to these calculations, we now have all the elements necessary to build a debt amortization schedule when the installments are advanced.

Now let's use a similar procedure to find the deferred payments.

In the first part we need to calculate the amount of the installment in the event of an deferred payment.

Basically the calculations used are the same as those used in the case in which the installment is advanced but here it is taken into account that the instalment number 0 is equal to 0 and the last installment is also present.

$$R = \frac{S}{\sum_{z=1}^{n}(1+i)^{-z}}$$

We have calculated the installments so it is time to calculate the amortization schedule.

For each installment we must find the capital stock (Ck), the interest (Ik) and the remaining debt (Dk) for every period.

We calculate the installment by multiplying the installment (R) by the proportion of the installment arrayinst (k), in case the installments are constant all the installments are multiplied by 1

$$Rk_k = arrayinst_k * R.$$

We calcolate the interest

$$Ik_k = Dk_{k-1} * ix$$

And we find the amount of capital paid (Ck)

$$Ck_k = Rk_k - Ik_k$$

Thanks to these calculations, we now have all the elements necessary to build a debt amortization plan when the installments are advanced.

We find the remaining debt by subtracting the stock of capital from the remaining debt of the preceding period

$$DK_k = DK_{k-1} - Ck_k$$

We now have all the data to build a debt amortization schedule, so we use the table command to create a table by entering the data found.

Finally we use the disp command to show the interest by period, we build a plot to be able to see more clearly the trend of the variables over time and thanks to the menu command we give the user the possibility to choose whether to save the amortization plan.

Examples using financial data

To better test the script I created, I took real financial data. I went to the websites of two different banks to make a fixed rate mortgage. Under these conditions, BNL bank offered a fixed rate of 4.51% while Santander Consumer bank proposed a fixed rate of 7.57%.
Let's enter this data and see what the results are.
These four examples illustrate and comment on the results. In order to see the full output for each of the four examples you can go to the last paragraph called appendix.

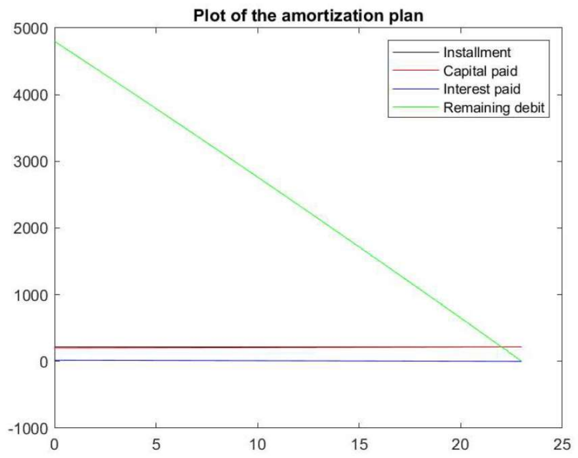
For those who want to try these examples if you want to start the script a second time, or more, to create a new amortization plan, it is advisable to write "clear" on the matlab Command Window otherwise the new data may be contaminated by those used in precedence.

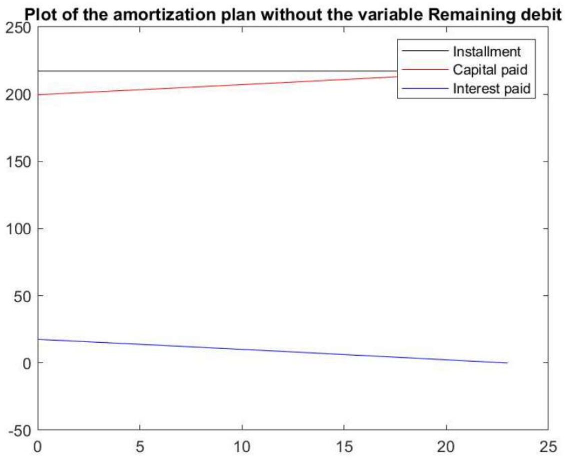
Example 1 - BNL bank (rate at 4.51%) constant advance mortgage payments

Let's start by entering the data for BNL bank (rate at 4.51%) and in this case we want the installments to be constant and in advance. A monthly loan of € 5000 has been requested, repayable in two years.

time	Installment	Capital_paid	Interest_paid	Remaining_debit
0	217,26	199,6450569	17,61393996	4800,354943
1	217,26	200,3803123	16,87868458	4599,974631
2	217,26	201,1182755	16,14072139	4398,856355
3	217,26	201,8589565	15,40004043	4196,997399
4	217,26	202,6023652	14,65663167	3994,395034
5	217,26	203,3485118	13,91048508	3791,046522
6	217,26	204,0974063	13,16159057	3586,949115
7	217,26	204,8490589	12,40993802	3382,100056
8	217,26	205,6034796	11,65551728	3176,496577
9	217,26	206,3606788	10,89831814	2970,135898
10	217,26	207,1206665	10,13833039	2763,015232
11	217,26	207,8834532	9,375543738	2555,131778
12	217,26	208,649049	8,609947888	2346,482729
13	217,26	209,4174644	7,841532492	2137,065265
14	217,26	210,1887097	7,070287166	1926,876555
15	217,26	210,9627954	6,296201488	1715,91376
16	217,26	211,7397319	5,519264997	1504,174028
17	217,26	212,5195297	4,739467195	1291,654498
18	217,26	213,3021994	3,956797543	1078,352299
19	217,26	214,0877514	3,171245465	864,2645474
20	217,26	214,8761966	2,382800346	649,3883509
21	217,26	215,6675454	1,591451531	433,7208055
22	217,26	216,4618086	0,797188327	217,26
23	217,26	217,26	-6,59433E-15	-1,79716E-12

From this amortization plan it is possible to note that there is also an installment at time 0 but in the last period (24) there is no installment as the installments are advanced. The installments also have the same amount of 217.26. At the last period the remaining debt is a small number close to 0 and not 0 as decimals have been removed because it is possible to make payments only with two decimal places and no more so there is a little bias.





In the first graph it is possible to appreciate how the remaining debt (green line) decreases constantly throughout the duration of the loan.
Thanks to the second graph we can better appreciate the other variables that are part of the amortization plan. In this second plot, all the variables found are taken into consideration except the remaining debt. The plot on the right shows us that the amount of the instalment (black line) remains constant (as a value of 217.26), the stock of capital (red line) increases more and more over time until it reaches the value of the installment while the interest (blue line) decreases until it reaches 0.

Example 2 - BNL bank (rate at 4.51%) mortgage payments in advance with different amounts

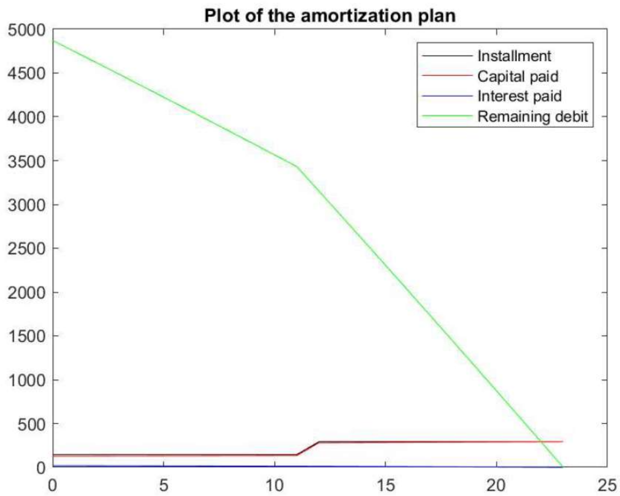
We continue by entering the data for BNL bank (rate at 4.51%) as before but in this case we want the installments to be in advance but to not always have the same amount. We want the instalments paid in the second year of the loan to be double the amount paid in the first year. A monthly loan of € 5000 has been requested, repayable in two years.

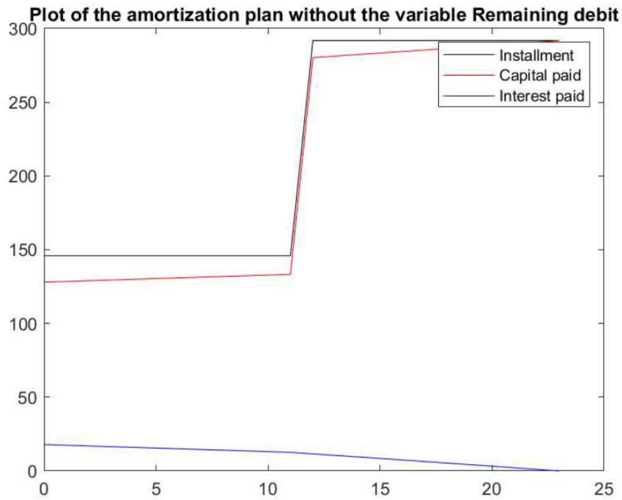
By entering the data correctly, we are shown the amortization schedule and two plots.

time	Installment	Capital_paid	Interest_paid	Remaining_debit
0	145.91	128,0352178	17,8766979	4871,964782
1	145.91	128,5067476	17,40516816	4743,458035
2	145.91	128,9800139	16,93190186	4614,478021
3	145.91	129,4550231	16,45689261	4485,022998
4	145.91	129,9317817	15,98013399	4355,091216
5	145.91	130,4102962	15,50161955	4224,68092
6	145.91	130,8905729	15,02134284	4093,790347
7	145.91	131,3726184	14,53929736	3962,417728
8	145.91	131,8564391	14,0554766	3830,561289
9	145.91	132,3420417	13,56987401	3698,219248
10	145.91	132,8294327	13,08248304	3565,389815
11	145.91	133,3186186	12,5932971	3432,071196
12	291,82	280,2588881	11,5649433	3151,812308

13	291,82	281,2910292	10,53280227	2870,521279
14	291,82	282,3269714	9,49686006	2588,194308
15	291,82	283,3667288	8,457102665	2304,827579
16	291,82	284,4103154	7,413516039	2020,417263
17	291,82	285,4577454	6,366086079	1734,959518
18	291,82	286,5090328	5,314798631	1448,450485
19	291,82	287,564192	4,259639487	1160,886293
20	291,82	288,6232371	3,20059439	872,2630563
21	291,82	289,6861824	2,137649028	582,5768739
22	291,82	290,7530424	1,070789037	291,82
23	291,82	291,82	3,3495E-15	9,12844E-13

From this amortization plan it is possible to note that we can make the same observations made in Example 1 except for the installments.
This table shows that as long as the variable time has a value of 11 the installment is 145.91, subsequently the installment takes on a double value exactly as it was requested when the data were entered.





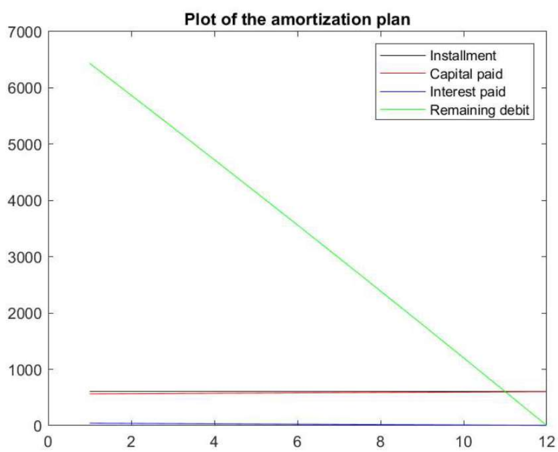
Thanks to these plots, the change that has occurred compared to the case previously considered is even more evident.
In the graph on the left it can be seen how from period 11 the line breaks to become even more decreasing. The graph on the right shows us a sudden change in the same period. The interest rate decreases more rapidly while the installment and the capital paid increase a lot.

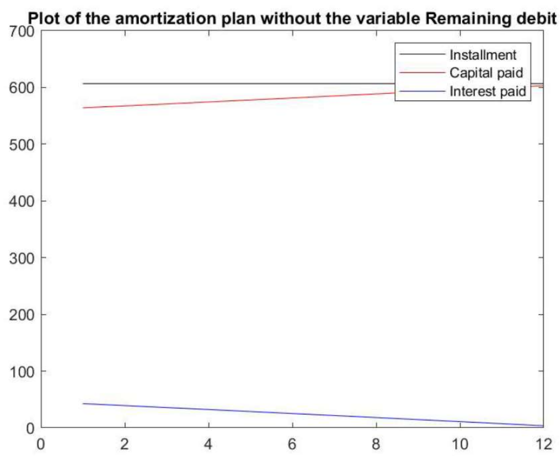
Example 3 - Santander Consumer bank (rate at 7.57 %) constant delayed mortgage payments

In this paragraph we insert the data to make a loan of € 7000 at the Santander Consumer bank (rate at 7.57%). The installments are constant, deferred, monthly and are repaid in one year.

time	Installment	Capital_paid	Interest_paid	Remaining_debit
1	606,72	564,0219321	42,69646026	6435,978068
2	606,72	567,4621807	39,25621169	5868,515887
3	606,72	570,923413	35,79497934	5297,592474
4	606,72	574,4057572	32,31263522	4723,186717
5	606,72	577,9093418	28,80905057	4145,277375
6	606,72	581,4342966	25,28409582	3563,843079
7	606,72	584,9807517	21,73764063	2978,862327
8	606,72	588,5488385	18,16955385	2390,313488
9	606,72	592,1386888	14,57970355	1798,1748
10	606,72	595,7504354	10,96795698	1202,424364
11	606,72	599,3842118	7,334180583	603,0401524
12	606,72	603,0401524	3,678239986	7,95808E-13

The installments have the same amount of 606.72. At the last period the remaining debt is a small number close to 0 and not 0 as decimals have been removed because it is possible to make payments only with two decimal places and no more.





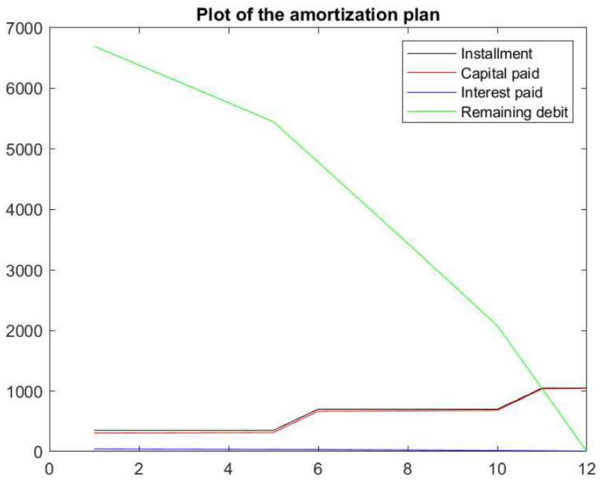
In the first graph it is possible to appreciate how the remaining debt (green line) decreases constantly throughout the duration of the loan. Thanks to the second graph we can better appreciate the other variables that are part of the amortization plan. In this second plot, all the variables found are taken into consideration except the remaining debt. The plot on the right shows us that the amount of the instalment (black line) remains constant (as a value of 606.72), the stock of capital (red line) increases more and more over time until it reaches the value of the installment while the interest (blue line) decreases until it reaches 0.

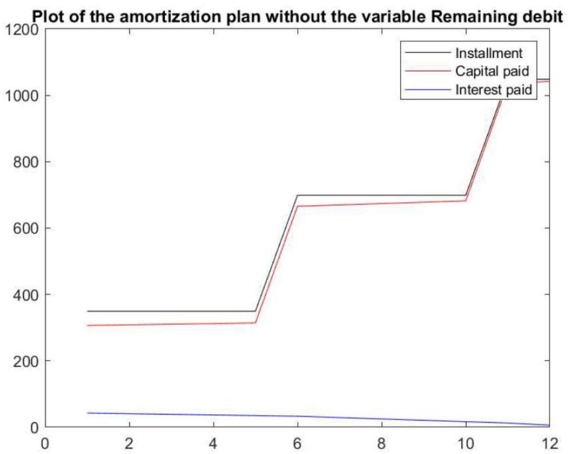
Example 4 - Santander Consumer bank (rate at 7.57 %) mortgage payments in delayed with different amounts

We continue by entering the data for Santander Consumer bank (rate at 7.57%) as before but in this case we want the installments to not always have the same amount. In this case we want the installments from number 11 to number 20 to have a double amount compared to the previous ones and we want the remaining installments to have an amount three times that of the first 10 installments. There is, as before, a loan of € 7000 at the Santander Consumer bank (rate at 7.57%). The installments are deferred, monthly and are repaid in one year.

time	Installment	Capital_paid	Interest_paid	Remaining_debit
1	349,47	306,7778196	42,69646026	6693,22218
2	349,47	308,6490091	40,82527069	6384,573171
3	349,47	310,531612	38,94266781	6074,041559
4	349,47	312,4256978	37,04858201	5761,615861
5	349,47	314,3313366	35,14294324	5447,284525
6	698,95	665,7228786	33,22568104	4781,561646
7	698,95	669,7834515	29,16510812	4111,778195
8	698,95	673,8687919	25,07976776	3437,909403
9	698,95	677,9790508	20,96950889	2759,930352
10	698,95	682,1143801	16,83417951	2077,815972
11	1048,42	1035,749213	12,67362673	1042,066759
12	1048,42	1042,066759	6,356080282	0

This table shows that when the variable time goes from 1 to 5 the amount of the installments is 349.47, 6 to 10 is double therefore 698.95 and subsequently the amount becomes 1048.42: three times the amount of the first payment. This respects exactly what was requested by the input data and the remaining debt equals 0.
This amortization schedule shows that we can make the same observations made in Example 3 except for the installments.
This table shows that as long as the variable time has a value of 11 the installment is 145.91, subsequently the installment takes on a double value exactly as it was requested when the data were entered.





In the graph on the left, the line of the remaining debt (green line) changes slope three times exactly in the periods in which the amount of the installments has increased. The same thing happens in the graph on the right for the interest paid, instead the amount of the installments and the capital paid makes a big leap exactly as we would have imagined and as the amortization plan shows.

Appendix

Finally this paragraph is dedicated to providing all the complete outputs of the four tests that have been done above to test the functioning of the test.
For those who want to try these examples if you want to start the script a second time, or more, to create a new amortization plan, it is advisable to write "clear" on the matlab Command Window otherwise the new data may be contaminated by those used in precedence.

Example 1 - BNL bank (rate at 4.51%) constant advance mortgage payments

Input the amount of the loan 5000
Indicates A if the installments are in advance and D if they are deferred (do not insert spaces) A
Indicates the total number of installments 24
Indicates the annual interest rate 0.045100
Indicate how many times a year you want to pay the installments 12
Indicate if you want the amount of the installments to be constant (Yes or No) Yes
The amount of constant 24 installments is 217.259

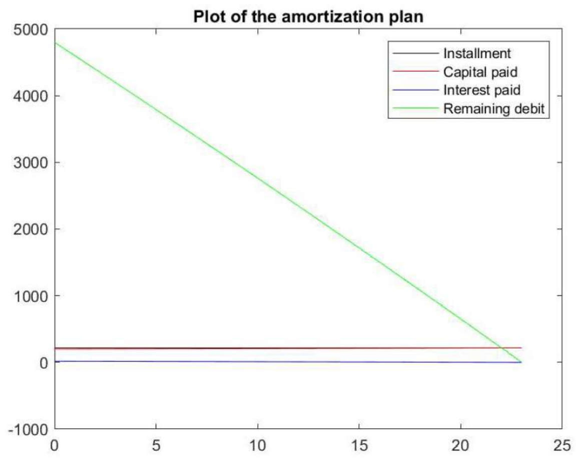
T =

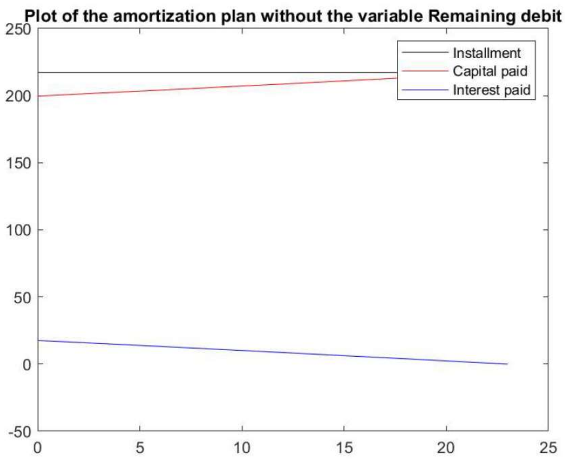
24×5 table

time	Installment	Capital_paid	Interest_paid	Remaining_debit
0	217.26	199.65	17.614	4800.4
1	217.26	200.38	16.879	4600
2	217.26	201.12	16.141	4398.9
3	217.26	201.86	15.4	4197
4	217.26	202.6	14.657	3994.4
5	217.26	203.35	13.91	3791
6	217.26	204.1	13.162	3586.9
7	217.26	204.85	12.41	3382.1
8	217.26	205.6	11.656	3176.5
9	217.26	206.36	10.898	2970.1
10	217.26	207.12	10.138	2763
11	217.26	207.88	9.3755	2555.1
12	217.26	208.65	8.6099	2346.5
13	217.26	209.42	7.8415	2137.1
14	217.26	210.19	7.0703	1926.9
15	217.26	210.96	6.2962	1715.9
16	217.26	211.74	5.5193	1504.2
17	217.26	212.52	4.7395	1291.7
18	217.26	213.3	3.9568	1078.4
19	217.26	214.09	3.1712	864.26
20	217.26	214.88	2.3828	649.39
21	217.26	215.67	1.5915	433.72

22	217.26	216.46	0.79719	217.26
23	217.26	217.26	-6.5943e-15	-1.7972e-12

Monthly interest per period is 0.0036828
It may happen that the debt remaining in the last period
is a small number other than 0.
This is due to the fact that during the calculations the
numerical values have been approximated.





Example 2 - BNL bank (rate at 4.51%) mortgage payments in advance with different amounts

Input the amount of the loan 5000
Indicates A if the installments are in advance and D if they are deferred (do not insert spaces) A
Indicates the total number of installments 24
Indicates the annual interest rate 0.045100
Indicate how many times a year you want to pay the installments 12
Indicate if you want the amount of the installments to be constant (Yes or No) No

Indicate the proportion of the installment amounts, for example by writing:
1 if you want it to be of a normal amount,
0.5 if you want the installment to be halved,
2 if you want the installment to have a double value and so on
Indicates the proportion of the installment number 1   1
Installment number 2   1
Installment number 3   1
Installment number 4   1
Installment number 5   1
Installment number 6   1
Installment number 7   1
Installment number 8   1
Installment number 9   1
Installment number 10   1
Installment number 11   1
Installment number 12   1
Installment number 13   2
Installment number 14   2

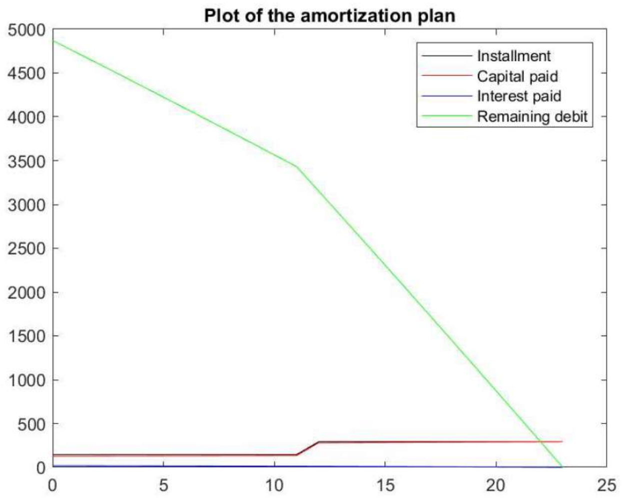
Installment number 15   2
Installment number 16   2
Installment number 17   2
Installment number 18   2
Installment number 19   2
Installment number 20   2
Installment number 21   2
Installment number 22   2
Installment number 23   2
Installment number 24   2
The amount of 24 installments is 145.9119

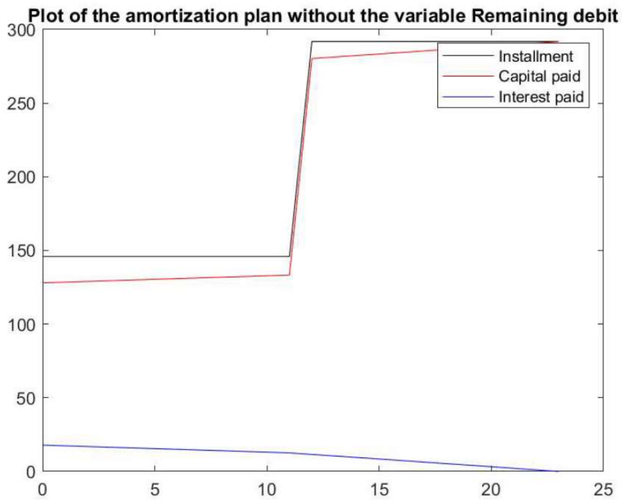
T =

24×5 table

time	Installment	Capital_paid	Interest_paid	Remaining_debit
0	145.91	128.04	17.877	4872
1	145.91	128.51	17.405	4743.5
2	145.91	128.98	16.932	4614.5
3	145.91	129.46	16.457	4485
4	145.91	129.93	15.98	4355.1
5	145.91	130.41	15.502	4224.7
6	145.91	130.89	15.021	4093.8
7	145.91	131.37	14.539	3962.4
8	145.91	131.86	14.055	3830.6
9	145.91	132.34	13.57	3698.2
10	145.91	132.83	13.082	3565.4
11	145.91	133.32	12.593	3432.1
12	291.82	280.26	11.565	3151.8
13	291.82	281.29	10.533	2870.5
14	291.82	282.33	9.4969	2588.2
15	291.82	283.37	8.4571	2304.8
16	291.82	284.41	7.4135	2020.4
17	291.82	285.46	6.3661	1735
18	291.82	286.51	5.3148	1448.5
19	291.82	287.56	4.2596	1160.9
20	291.82	288.62	3.2006	872.26
21	291.82	289.69	2.1376	582.58
22	291.82	290.75	1.0708	291.82
23	291.82	291.82	3.3495e-15	9.1284e-13

Monthly interest per period is 0.0036828
It may happen that the debt remaining in the last period
is a small number other than 0.
This is due to the fact that during the calculations the
numerical values have been approximated.





Example 3 - Santander Consumer bank (rate at 7.57 %) constant delayed mortgage payments

Input the amount of the loan 7000
Indicates A if the installments are in advance and D if they are deferred (do not insert spaces) D
Indicates the total number of installments 12
Indicates the annual interest rate 0.0757
Indicate how many times a year you want to pay the installments 12
Indicate if you want the amount of the installments to be constant (Yes or No) Yes

The amount of constant 12 installments is 606.7184

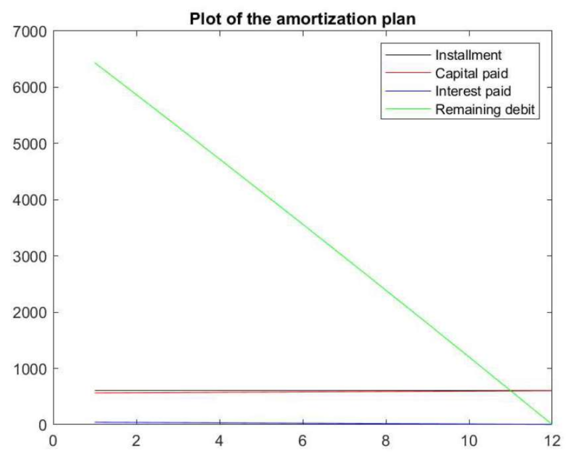
T =

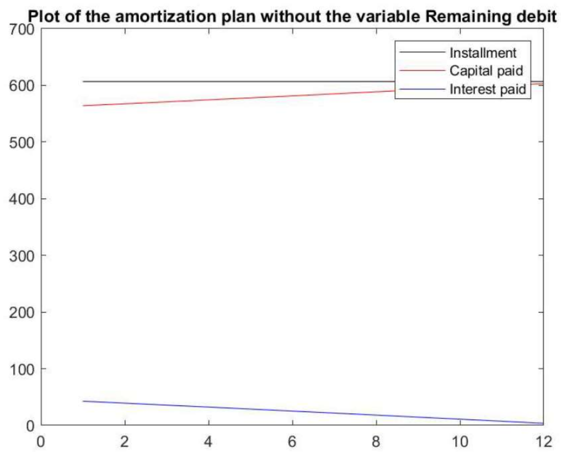
12×5 table

time	Installment	Capital_paid	Interest_paid	Remaining_debit
1	606.72	564.02	42.696	6436
2	606.72	567.46	39.256	5868.5
3	606.72	570.92	35.795	5297.6
4	606.72	574.41	32.313	4723.2
5	606.72	577.91	28.809	4145.3
6	606.72	581.43	25.284	3563.8
7	606.72	584.98	21.738	2978.9
8	606.72	588.55	18.17	2390.3
9	606.72	592.14	14.58	1798.2
10	606.72	595.75	10.968	1202.4
11	606.72	599.38	7.3342	603.04
12	606.72	603.04	3.6782	7.9581e-13

Monthly interest per period is 0.0060995
It may happen that the debt remaining in the last period
is a small number other than 0.

This is due to the fact that during the calculations the
numerical values have been approximated.





Example 4 - Santander Consumer bank (rate at 7.57 %) mortgage payments in delayed with different amounts

Input the amount of the loan 7000
Indicates A if the installments are in advance and D if they are deferred (do not insert spaces) D
Indicates the total number of installments 12
Indicates the annual interest rate 0.0757
Indicate how many times a year you want to pay the installments 12
Indicate if you want the amount of the installments to be constant (Yes or No) No
Indicate the installment amounts by writing 1 if you want
it to be of a normal amount, 0.5 if you want the installment to be halved,
2 if you want the installment to have a double value,
3 if you want the installment to have a value 3 times greater and so on
Indicates the amount of the installment number 1 1
Indicates the amount of the installment number 2 1
Indicates the amount of the installment number 3 1
Indicates the amount of the installment number 4 1
Indicates the amount of the installment number 5 1
Indicates the amount of the installment number 6 2
Indicates the amount of the installment number 7 2
Indicates the amount of the installment number 8 2
Indicates the amount of the installment number 9 2
Indicates the amount of the installment number 10 2
Indicates the amount of the installment number 11 3
Indicates the amount of the installment number 12 3
The amount of 12 installments is 349.4743

T =

12×5 table

time	Installment	Capital_paid	Interest_paid	Remaining_debit

1	349.47	306.78	42.696	6693.2
2	349.47	308.65	40.825	6384.6
3	349.47	310.53	38.943	6074
4	349.47	312.43	37.049	5761.6
5	349.47	314.33	35.143	5447.3
6	698.95	665.72	33.226	4781.6
7	698.95	669.78	29.165	4111.8
8	698.95	673.87	25.08	3437.9
9	698.95	677.98	20.97	2759.9
10	698.95	682.11	16.834	2077.8
11	1048.4	1035.7	12.674	1042.1
12	1048.4	1042.1	6.3561	0

Monthly interest per period is 0.0060995
It may happen that the debt remaining in the last period is a small number other than 0.
This is due to the fact that during the calculations the numerical values have been approximated.