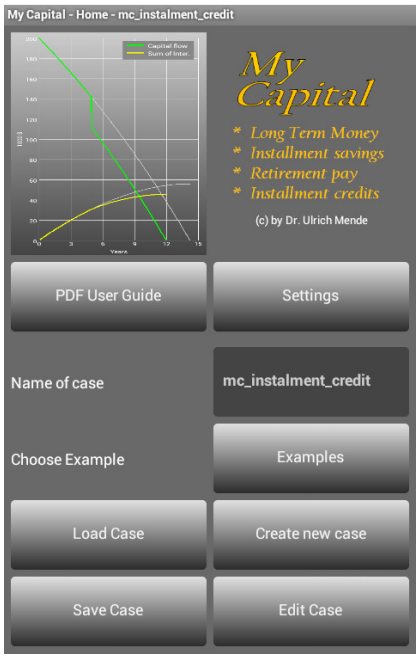

My Capital

- ***Long Term Installments***
- ***Installment savings***
- ***Retirement pays***
- ***Installment credits***

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Content

1 Was does *MyCapital App offer to you*?

MyCapital calculates the capital flow of your account caused by

- Interests and interests on interests
- Periodic monthly installments
- Five parameters are used
  - Initial value of capital (= starting capital = S)
  - Final value of capital on your account (= F)
  - Monthly installment (= I)
  - Interest rate (R)
  - Duration (D)

MyCapital can calculate all kinds of long term financial processes:

- Saving processes (long term money, installment saving)
- Dissaving processes (private retirement payments with fix monthly installment)
- Running into debt (not recommended)
- Installment credits(Amortization of installment credits))

These basic processes are described by the following parameter combinations:

	S = Initial capital	**I= Installment, monthly**	**F = Final capital**	**Int = Interests**
Saving	S >=0	I = 0 : Long Term Money I > 0: Installment saving	F >= S	Int > 0
Dissaving	S > 0	I < 0	F >=0 (often = 0)	Int > 0
Running into debt	S < =0	I < 0	F < 0, F < S	Int < 0
Installment credits	S < 0	I > 0, I > R*S	F = 0	Int < 0

To run into debt is not recommended, but can be calculated as well as the other processes.

Upon the basic parameters a capital process can be driven by the following so called *Special Actions*:

- Single deposit or withdrawal at a given time, even more than once in one process
- Periodic deposit or withdrawal (besides the periodic monthly installment, for instance yearly deposit at the end of each year)
- Change of installment value at a given time, even more than once in one process, can even change in sign, so the process switches from saving to dissaving
- Change of interest rate at a given time, even more than once in one process
- Adjustment of final capital to yearly inflation rate (only for saving processes)
- Adjustment of monthly installment to yearly inflation (only for dissaving processes)

2 Wherein is *MyCapital* better than other financial apps?

Functionality

- *MyCapital* can calculate each of the five credit parameters (Initial capital, final capital, installment, interest rate, duration) if given the four others. Thereby MyCapital allows you to quickly calculate every thinkable scenario. MyCapital can calculate “forward” if you are interested in the final capital or in the duration of the process when given initial capital, installment and interest rate. It can calculate “backward”, if you have to determine the initial capital or the installment of the process, when given duration, final capital and interest rate.
- *MyCapital* can take into account several Special Actions
  Thereby it becomes very simple to calculate „connecting processes” with changed parameters.
  Example:
  Usually in an installment credit there is a fixed interest rate for a number of years (10 years)

After that time you have the right for special amortizations (= special deposits). On the other hand your bank can adjust the interest rate to the market (Be sure – they will increase it!) Within seconds MyCapital can calculate, how your capital will develop after your special payment and/or change of interest rate.

- *My Money* can take in account the yearly inflation rate in its calculation (Compensation of Inflation = CoI). Especially for long running processes of 5, 10 or even 20 years this can be very important.

Presentation of the results
MyCapital is presenting you the calculation results in different ways

- Payment plan with tree levels of aggregation: Years, Quarters, Months
- Chart for Capital flow and flow of interest sum over time
- PDF-Output of process parameters including payment plan and capital chart, e-Mailing via 1-Click-Mail

Help for the User
MyCapital gives dedicated help to the User:

- Build-in down load function for this User Manual from the app's home page to make it available on your device offline.
- Field specific help for all input parameters via click on the naming field labels.
- MyCapital offers all the basic processes as build-in-examples. You can use these examples, test them and adjust them to your needs. This is very helpful to get familiar with MyCapital.

Storing and distributing the results
MyCapital offers you to store every capital process under a free name on the file memory of your device. So you can always go back to a previous process, can store several variants and so on.

MyCapital is more powerful and much quicker than the computer programs your bank advisor will use to sell you its expensive installment credit. Just use this advantage in the negotiation with your bank.
Check the information of your bank advisor, proof his calculations and be prepared – MyCapital is on your side.

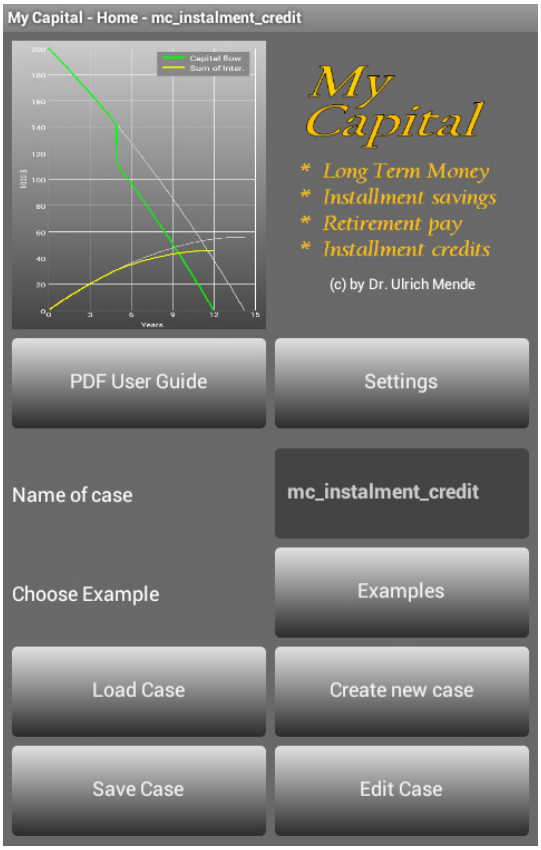
MyCapital is *YourMoney*!

Spending one „illuminating" evening with MyCapital can save you thousands of dollars.

3 The Screens of MyCapital

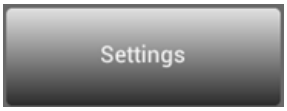
3.1 Screen MyCapital - Home

This is the initial screen of MyCapital which allows you to store your processes to file. You can reload any of these files later on, recalculate the process, change its parameters, save it under the old or under a new name. You will find this very helpful when using special actions with lots of input fields.
On the home screen you will find the buttons for the MyCapital settings and for the offline help, too.



MyCapital Home-Screen

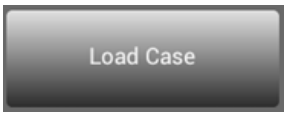
With this button you can view offline the PDF User Manual, downloaded before via the screen „Settings“. If you are a power user of MyCapital, than it may useful to download this PDF to your desktop as well, to view it on a large display. Or, just print it and have it handy.



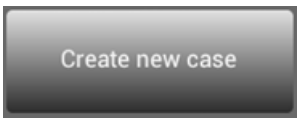
This button opens the settings screen where you can customize MyCapital to your device (language, text size). Here you can download the PDF User Manual to your device to use it offline.

As a special service MyCapital offers examples for all kinds of long term capital processes. Choose *Long Term Money*, *Installment Savings*, *Retirement payment* or *Installment credit* to open an example. View the example parameters, calculate it, view graphic and payment plan. You can save an example under a new name. You cannot overwrite examples since they are build-in.

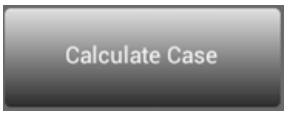
You can store the actual case as a text file on the external storage of your device (SD-card). Choose a free name for your case via file name dialog.



You can choose a stored case from a file list via dialog, open it, and continue working with it.



With this button you create a completely new case with the name „new_case“. Via the screen “Parameter” you have to fill four of the five process parameters, and mark the fifth as the calculation target via the green radio button. If you want to continue witch this case later on, then you should save it under a meaningful name.

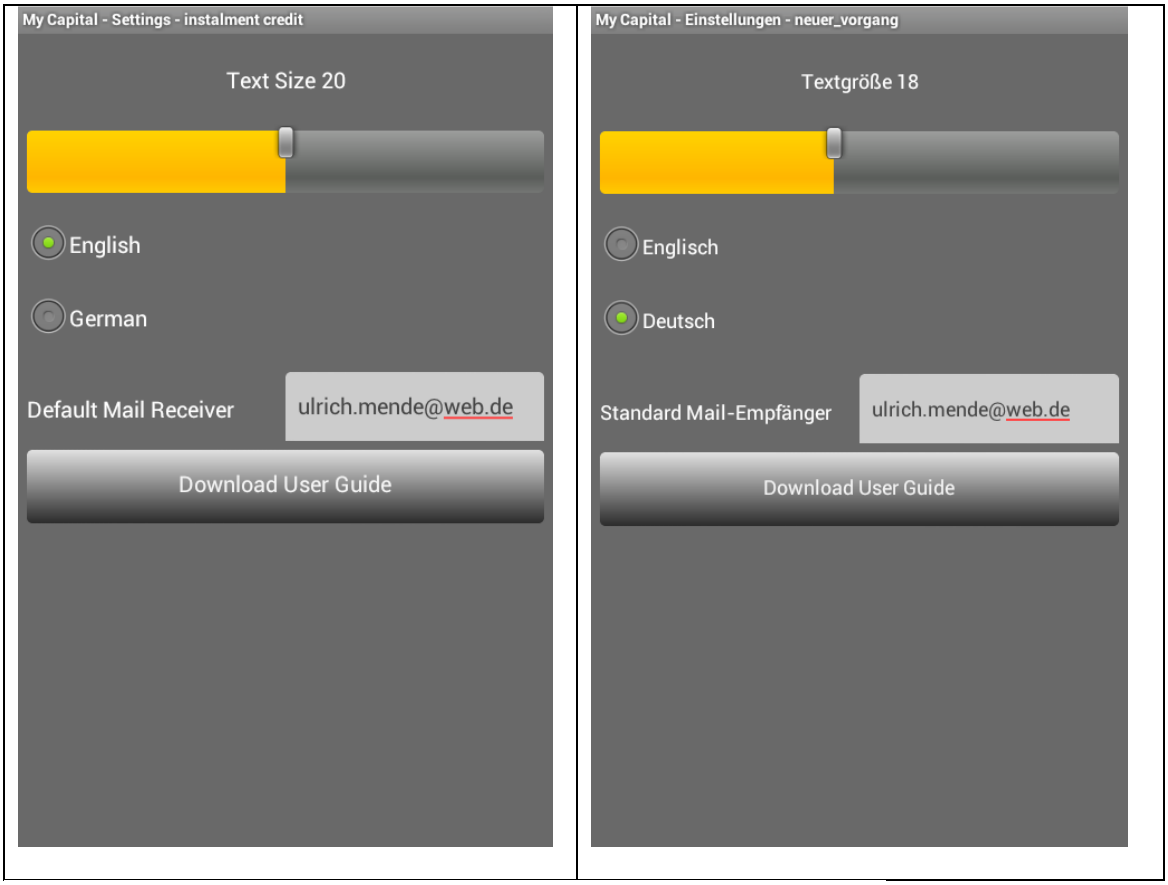


This button opens the screen „Parameters“ for this case. If you have opened a case via file load or via “Examples”, then its parameters will be shown. You can now continue to edit and re-calculate this case.

3.2 Screen MyCapital - Settings

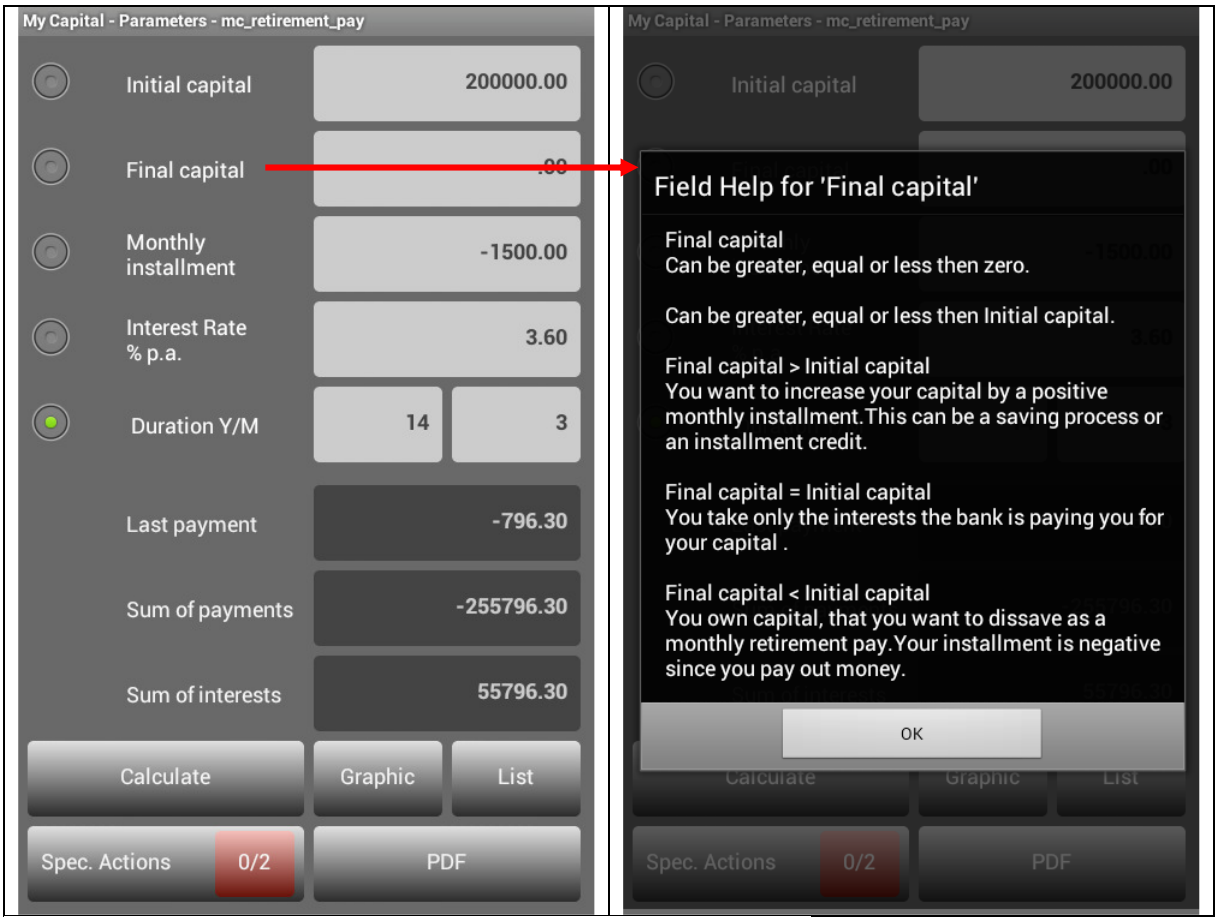
With MyCapital you can make important settings once and automatically store them in the settings file when leaving the app. On every start of the MyCapital App this file will be reread and the settings will be restored.

- Text size:
  By a slider you can fit the text size for all screens to your device. While moving the slider you can watch the text size changing.
- Language:
  MyCapital reads the language from the system data of the device and makes the appropriate setting. For German-speaking countries (Germany, Switzerland, Austria) German is the default; for all other countries it will be English. But you are free to choose between the two.
- Download the User Manual with respect to the language from the home page of the app. After downloading the manual can be displayed offline via the help button of the Home Screen.
  - MyCapitalUserGuidGerman.pdf
  - MyCapitalUserGuideEnglish.pdf
- Last used capital process with all inputs



Adjust the text size, language and the default mail receiver on the Settings-Screen

3.3 Screen MyCapital – Process Parameters



MyCapital Parameter-Screen (left) with Online-Help for field "Final capital"

Basic parameters for a capital process:

1. **Initial capital:**
   This is the capital value of your account on process start.

   Initial capital > 0:
   You have capital that you want to increase by interests and/or monthly deposit. Or you want to dissave this capital when you are in retirement (= monthly retirement pay)
   Initial capital = 0:
   you start a (saving) process from zero. Because you get no interests on zero capital, you will have to make a monthly deposit. In case of a monthly withdrawal you will run into debt.
   Initial capital < 0.
   You are in debt and want to pay back by a monthly installment (installment credit). Even further withdrawals will be calculated by MyCapital without any difficulties, but this will bring you deeper and deeper into debt.
   It is also possible to calculate the initial capital needed for a process with given result (backward calculation)
2. **Final capital**:
   This is the desired credit value of your account at the end of the process. It can also be calculated when the other parameters are given. Positive, negative or zero values are possible here as well. Only the initial capital it will determine what kind of process you have.
   Final capital > Initial capital: Installment savings.
   Final capital < Initial capital, especially final capital = 0: Dissaving process.
3. **Monthly installment (rate)**:
   The monthly installment can be positive, negative or zero as well.
   Installment > 0

you want to increase your capital by deposits. If this will work depends on your initial capital value. If it is positive, then your monthly installment and the interests, the bank is paying, will complement one another. Your capital will rise quickly.
If you are in debt then you have to pay interest to the bank, which will partially compensate the deposit
Rate < 0
you extract capital from your account. It will depend on the initial capital and the interest rate again if your capital will rise, stay constant or will fall. MyCapital App knows the right answer.

4. Interest rate (% p.a.)
   The interest, the bank will pay or bill to you, is given in % per anno, but will be added to your capital at the end of every month. Therefore a monthly interest rate is used. (ZM = ZY/12). The interest rate is always positive or zero. This is not true for the interests. Negative capital will result in negative and positive capital will result in positive interest.
5. Duration
   MyCapital App calculates the duration of the capital process in months. On the screen it will be shown as years: months. The duration is always positive; in some cases the duration is undefined. (The process will never reach the desired final capital because of improper parameter values.) Often the duration is the target of MyCapital' s calculation. But it can be set up as well to calculate the initial or final capital value of a process for a given duration.

Calculation target field
Use the radio buttons on the left to mark one of the five parameters as calculation target. You don't have to input any value for that field

Result values of process calculation

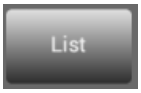
1. Last payment
   last payment can differ from the previous payments if you choose duration as calculation target. MyCapital will calculate an exact duration of years, months and days, which will be rounded to full months. In the last month you won't have to pay the full instalment, therefore.
2. Sum of payments
   this is the sum of all payments from or to your account, including special payments as well, but not including interests.
3. Sum of interests
   this is the sum of interests the bank pays to you (positive = credit interests) or charges you (negative = debit interests) while the whole duration of the process.

Buttons and their functions

This button starts a complete re-calculation of your process including the actual settings of the parameters and special actions, if so. If the text "Calculate" is red, you have changed anything in the processes and must re-calculate it because the results are not up-to-date anymore. Only after recalculation you can open the graphic or the payment plan. When calculation is ready then the text colour changes back to normal colour. If you have no special actions in your process this happens immediately, otherwise it may take 2 or 3 seconds.

This button opens the screen „Special actions". You can create, change, delete or activate special actions there. A little button within the Special Actions button will show you, how many special actions you defined in your case and how many of them are active. If required you can activate or deactivate all special actions at once with that small button. If the small button is red, then all actions are off, if it is green, then all actions are on. Otherwise it is yellow.

This button opens the screen "Graphic". Calculation must be up-to-date for that.

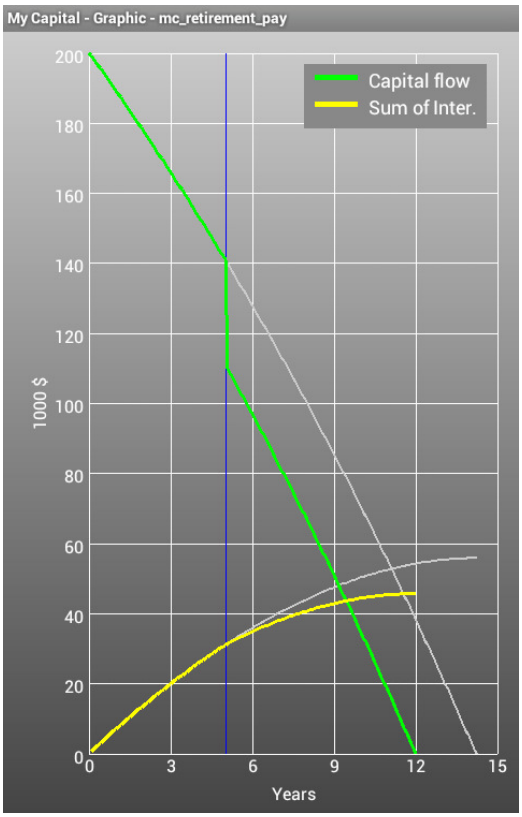


This button opens the screen “Payment plan”. Calculation must be up-to-date for that.

This button opens the screen “PDF”. Calculation must be up-to-date for that.

3.4 Screen MyCapital – Capital Flow Graphic

MyCapital will present the calculation results directly as numbers on the Parameter-Screen. Furthermore the capital flow can be displayed as a chart. In that chart you can combine the capital with and without Special Actions. This allows a quick, direct comparison between the two.



Screen Graphic with curves for capital flow and flow of interest sum

3.5 Screen MyCapital – Payment Plan

This screen shows the detailed payment plan of your process numerically as a table with the following columns:

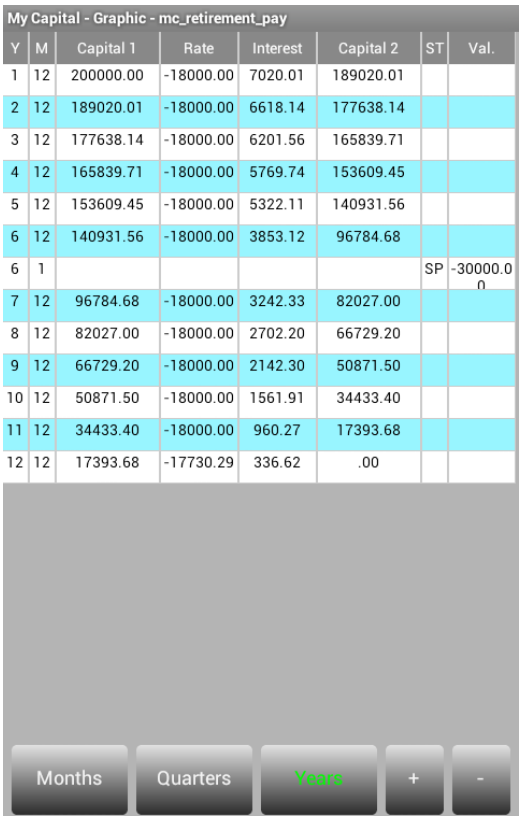
- Capital value at beginning of month
- Installment in this month
- Interests in this month
- Special Actions in this month, if so
- Capital value at the end of month, including installment, interests, special payments
- Year
- Month
- Sum of installments including special payments up to this month
- Sum of interests up to this month

The payment plan can be displayed in three levels of aggregation:

- Months = Full resolution to every month (= 12 rows /year = 240 rows / 20 years)
- Quarters = aggregation of each three month of a quarter to one quarter line
- Years: aggregation of each 12 months of a year to one year line

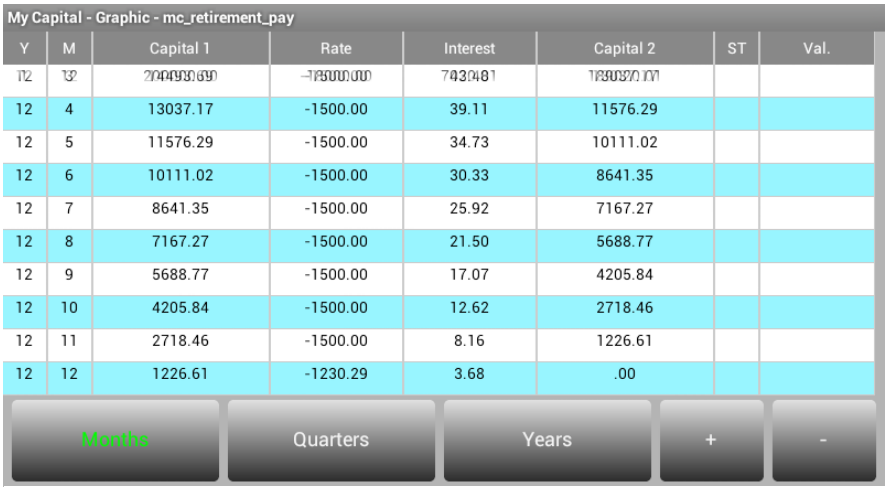
With the „+“- and „-“-buttons you can adjust the text size auf the payment plan..

The plan can be scrolled per finger wipes vertically. In portrait format the plan is scrollable horizontally too. Otherwise not all columns will fit on the screen. The columns for year and month are positioned in the middle of the screen to be visible when scrolling horizontally.



Payment plan for an installment credit in year level, format Portrait.

As you can see, in the first year 80% of the installment will be paid for interest and only 20% as real amortization. I the sixth year the special deposit of $ 30,000 is shown.



Payment plan for an installment credit with special deposit on months-level, format landscape.

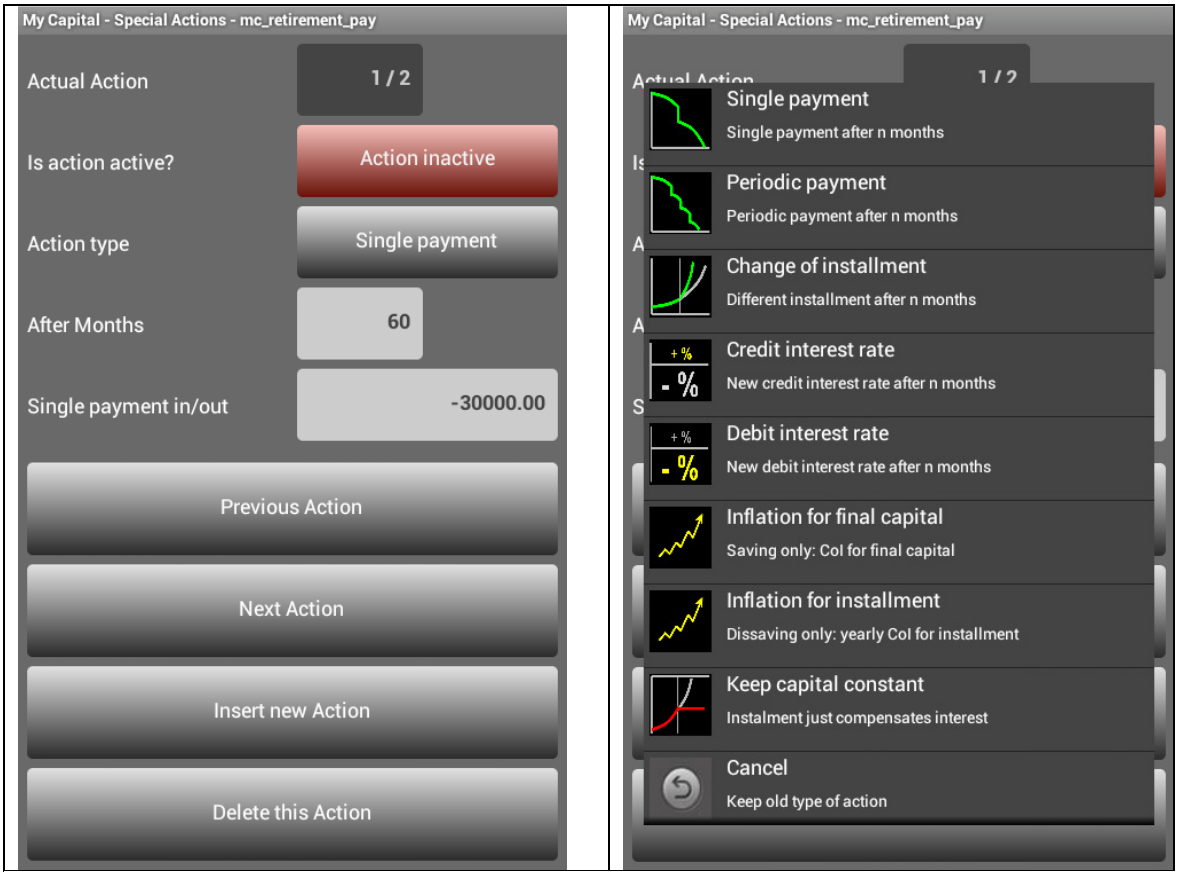
In this format all columns can be shown at once. Text size was enlarged. Pay attention to the last line, where a different last payment will finish the process.

3.6 Screen MyCapital – Special actions

Different Special Actions are a unique feature of MyCapital in comparison with other financial apps. You can choose one or more from the following Special Actions:

- **Single Payment**
  - Deposit or withdrawal
  - at the end of a given month
  - directly effects the capital and the interests (long term)
  - can be used multiple times in one process
- **Periodic payment**
  - Deposit or withdrawal
  - starting from a given month with a given period.
    (Example: starting after 5 years with a period of 12 months)
  - directly effects the capital at each repetition
  - effects the interests long term
- **Change of monthly installment**
  - at a given month
  - replaces initial value of installment from this month on
  - effects capital and interests from this month on
  - can be used multiple times in one process
- **Set debit interest rate**
  - at a given month
  - replaces the initial value of interest rate for negative capital from this month on
  - treats the interest rate from the parameter screen as credit interest rate from this moment on
  - effects interests directly and the capital in long-run
  - can be used multiple in one process
- **Set credit interest rate**
  - at a given month
  - replaces the initial value of interest rate for positive capital from this month on
  - treats the interest rate from the parameter screen as debit interest rate from this moment on
  - effects interests directly and the capital in long-term
  - can be used multiple times in one process
- **Set on Compensation of inflation (CoI) for final capital (saving processes only)**
  - Increases the Final capital with respect to given inflation rate and duration
- **Set on CoI for installment (dissaving processes only)**
  - Increases the installment of a dissaving process each year with respect to given inflation rate, duration and initial installment.
- **Keep capital constant**
  - at a given month
  - replaces initial value of installment from this month on to a value compensating interest
  - effects capital and interests from this month on
  - should be followed by another “Change of monthly installment”

Each Special Action can be activated or deactivated any number of times. This avoids repeated input. Only activated Special Actions (color: green) will effect the calculation. Special Actions are very useful for connecting processes which directly follow after the end of one process. These connecting processes usually start with an initial capital value equal to the final capital of the primer process but different parameters (installment, interest rate).
Depending on the Type of a Special Action there different fields available on the Special-Action-Screen.



On the Special-Screen you can add or delete Special Actions, can scroll and input the values of a Special Action.

WARNING:
When using Special Actions, MyCapital can use iterative calculations only. This may take some seconds.

Hint:
To quickly switch on and off all special actions of a process at a time use the small button within the Specials button of the parameter screen. To switch on / off one single action you have to go into the Special Actions-Screen of that action.

3.6.1 Special Actions for quarter wise and yearly installments

Even though it is untypical, saving processes can be calculated not only with monthly installments, but with quarterly and yearly installments as well. This is done by setting the monthly installment to zero and inserting a Special Action “Periodic payment” with period quarter or year.
An example would be a saving process with a periodic deposit at the end of each year (gratification 5000 $)
NOTICE: In the given case (Initial capital =0, monthly installment=0) the process cannot be calculated without Special Actions. The capital would stay zero all the time. A comparison between the two variants will not be possible therefore. .

3.6.2 Special Actions for debit and credit interest rates

You can enter just one value for the interest rate of a process on the parameter screen. The signs of initial and final capital will determine if there will be debit or credit interests. For saving cases initial and final capital are >= 0 both, usually, and you will have positive interests (credit interests) only. For an installment credit on the other hand there will be debit interests only. The payments will stop in the moment the capital (the debt) is zero.
If one process should run from positive into negative capital (or vice versa) anyhow, then a second rate of interest can be set up via a Special Action. If you choose “Debit interest rate" here, the interest rate from the Parameter-Screen will work as “Credit interest rate” now - and vice versa.

The following example demonstrates how the change between debit and credit interest rates will work.

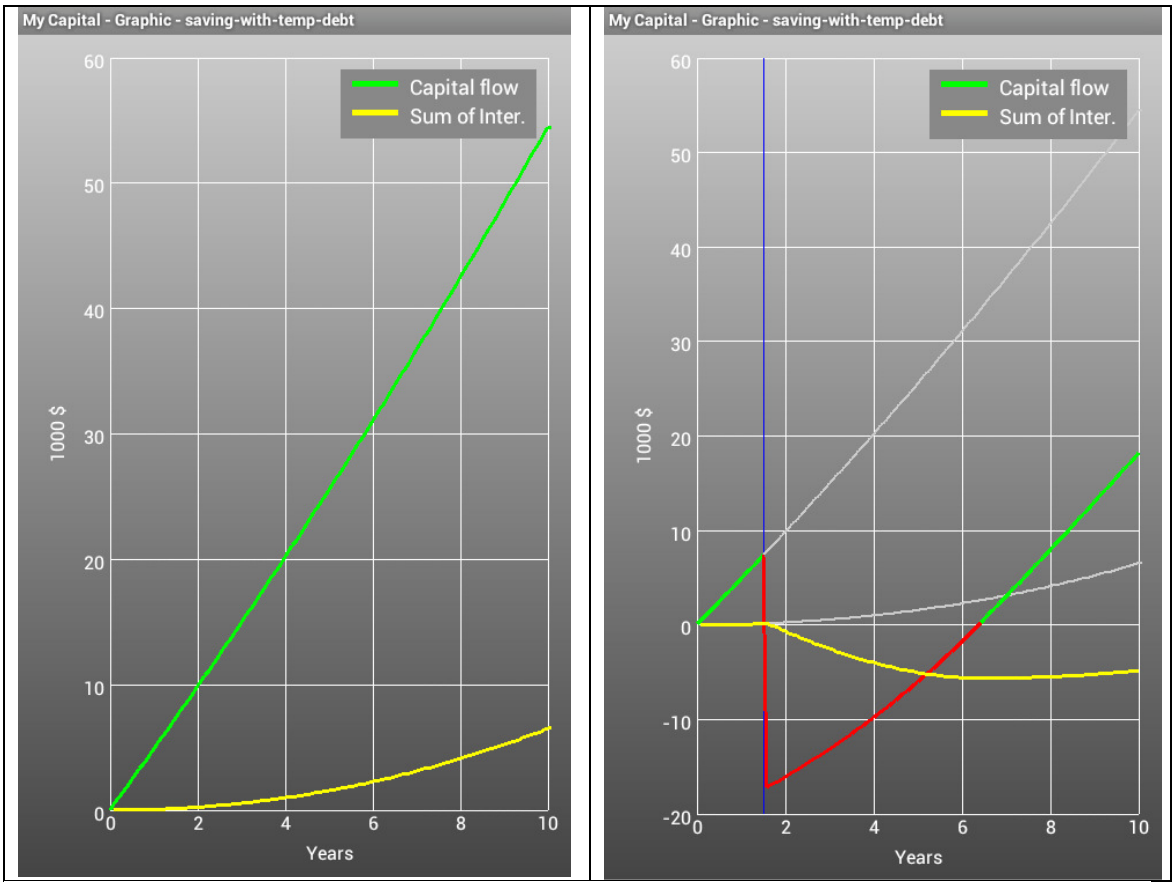
10 years before his retirement a man starts a saving process with a monthly installment of $400 to have additional capital for retirement. His bank will pay him interests of 2.5 % p.a. MyCapital calculates the final capital of that process to $ 54,468.78
Unfortunately the man has to make a withdrawal of $25,000 from his account after 1.5 years for an urgent medical surgery. At this point the account balance is about $ 7,000, so the account will run into an overdraft credit (12% p.a.) Now the man hast to pay high debit interests to the bank. Since he has no extra money, he cannot increase the installment. The duration should stay at 10 years.

In MyCapital the situation can be modeled by two special actions.

1. Action
Type = Single withdrawal
Month = 18
Value = - $25,000

2. Action
Type = Debit interest rate
Month = 0 (Month is not of importance as long as < 18))
Value = 12.5 %

Result:
Final capital = $ 18,152.92



Planned saving process (left) und with special withdrawal and debt interest rate on negative capital (right)

The saving process starts as usual, capital is rising; sum of interests is rising slowly. After the withdrawal the capital jumps down to a debt of $ -17,600. After that the capital is rising very slowly, because the man has to pay 12 % p.a. = 1% p.m. of $ -17,600 = $-176 of his monthly installment as interests to the bank. Because of the negative interests the sum of interests is falling rapidly. Only after 7.5 years the debt will be repaid and saving will restart again – unfortunately with the slow credit interest rate.

After the 10 years the man will have a final capital of $ 18,152, only. Relatively to the planed $54,468 the man lost not only $ 25,000 for the surgery, but also $ 11,316 by escaped and paid interests.

NOTICE:
In the process there are two moments, when the interest rate changes, the first just after the withdrawal (2.5% → 12 %) and the second after paying off the debt. (12 % → 2.5%) This double change is reached by one single special action for debit interest only. The triggering event for that is the change of the capital's algebraic sign.

HINT:
If a special interest rate (debit or credit) should be valid for the whole process, just set the month in the special action to zero.

3.6.3 Special action „Keep capital constant"

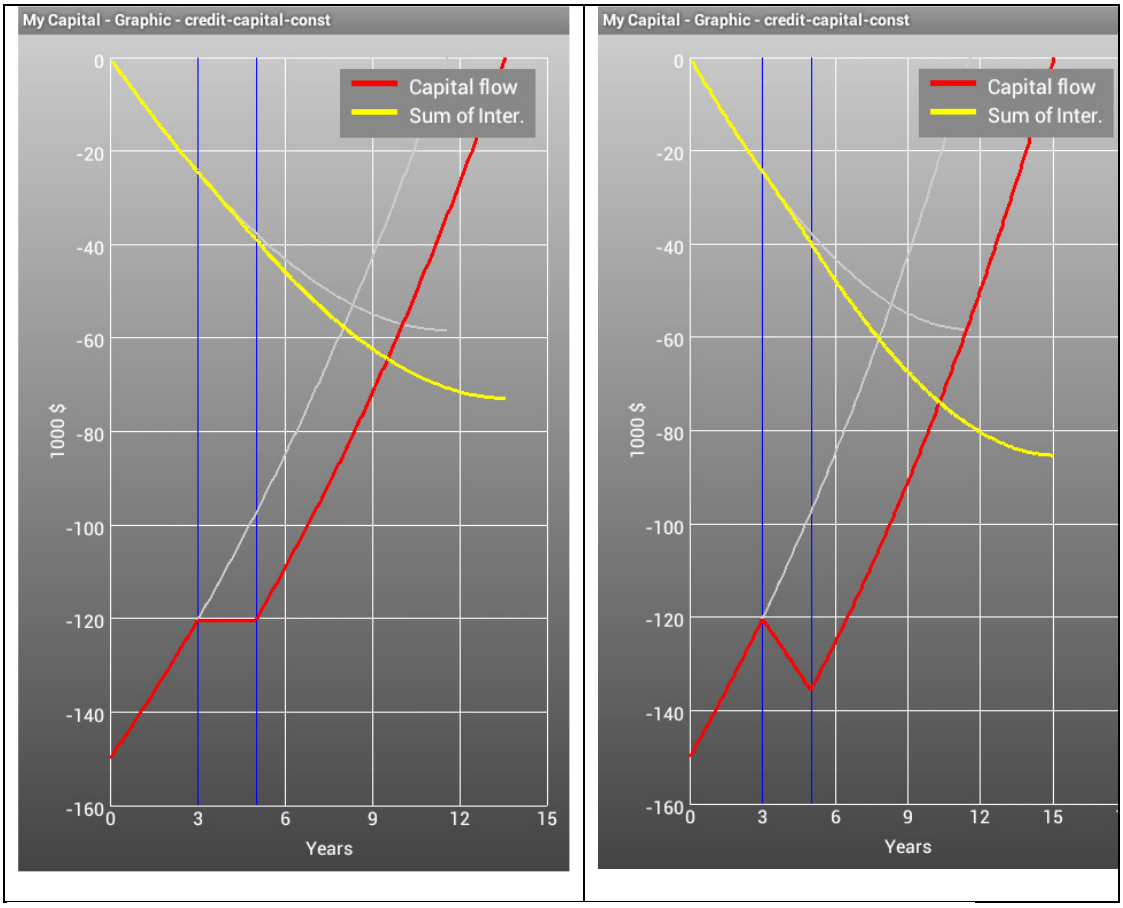
From the given moment the instalment is adjusted so that it will compensate the interest. So the capital will stay constant.

Positive capital
You can withdraw just as much from your account as you will be paid interest by the bank.

Negative capital (instalment credit)
This case is called interest-only-instalment. Your monthly instalment is as high as the interest is the bank will bill you. Since your debt will not reduce, you should keep this time as short as possible.

Even more bad would be a period of zero instalment in which your debt would increase.

The following figure show an instalment credit with two years of interest-only instalment. Two special actions have been used for that: "Keep capital constant" (after 3 years)" and "Change instalment" (after 5 years)
Interest increased by $ 15,000, what exactly matches 6%p.a. * 2 years * capital after 3 years.
For comparison in the right part of the figure the same credit with two years of zero instalment is shown.
Therefore the special action "Keep capital constant" was changed to "Change of instalment" (new value = 0.)
This period with zero instalment will cost you $25,000 !



Instalment credit with 2 years of interest-only-instalment (left) and zero instalment(right)

3.6.4 Combination of special actions

Special Actions can be combined in one process, even though the clarity of the process can get lost by doing so. When using several Special Actions in one process, you will not be able to decide, which influence on the process each of them has.

Possible combinations of Special Actions: installment credit
While paing off an installment credit the binding period for interest rate is fixed by 5 or 10 years. After that period you have the possibility to make an unscheduled payment to your account. At the same time your bank can fit the interest rate to actual market conditions. Both changes can be modeled by a Special Action each in MyCapital. So you can simulate different scenarios for your connecting process.

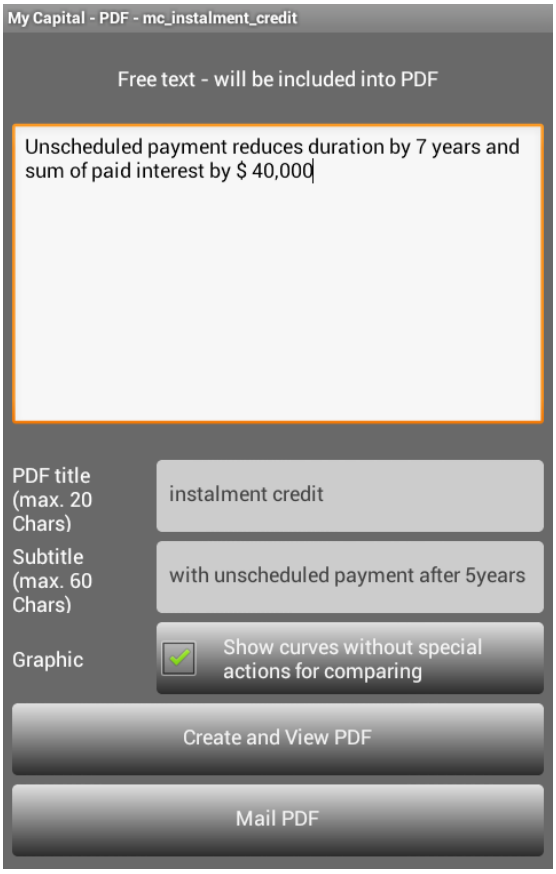
Possible combinations of Special Actions: retirement payment
When dealing with long term retirement payments it is a good idea, to take inflation into account. MyCapital can do this by fitting the installment to inflation each year. Nevertheless their can arise a situation, where you need to extract a large amount of money from your account (illness, world round trip, new car) In that case you can activate an additional Special Action for an unscheduled withdrawal in your process.

Not meaningful combinations: retirement payment
When using the Compensation of Inflation, the installment will be automatically adjusted to inflation each year. It is not very meaningful to change the installment by further Special Actions. The inflation Adjustment will be calculated with respect to the new installment. Clarity will be lost.

General recommendation
Test the influence of just one Special Action on the calculation results. In most cases this will be more effective than to the use several Special Action working in different directions.

3.7 Screen MyCapital – PDF

An absolute advantage of MyCapital with respect to other financial apps is the possibility to put the calculation results inclusively the graphic into a PDF. If your device has a printer driver installed, you can directly print this PDF.



Screen PDF

But usually only view Android devices have a printer installed, so you can send the PDF via mail to any other person, including to yourselves to print it there.

This mail function allows you to use MyCapital as a service program for other persons, too.

Free text
Here you can enter free text, especially fort he special actions used.

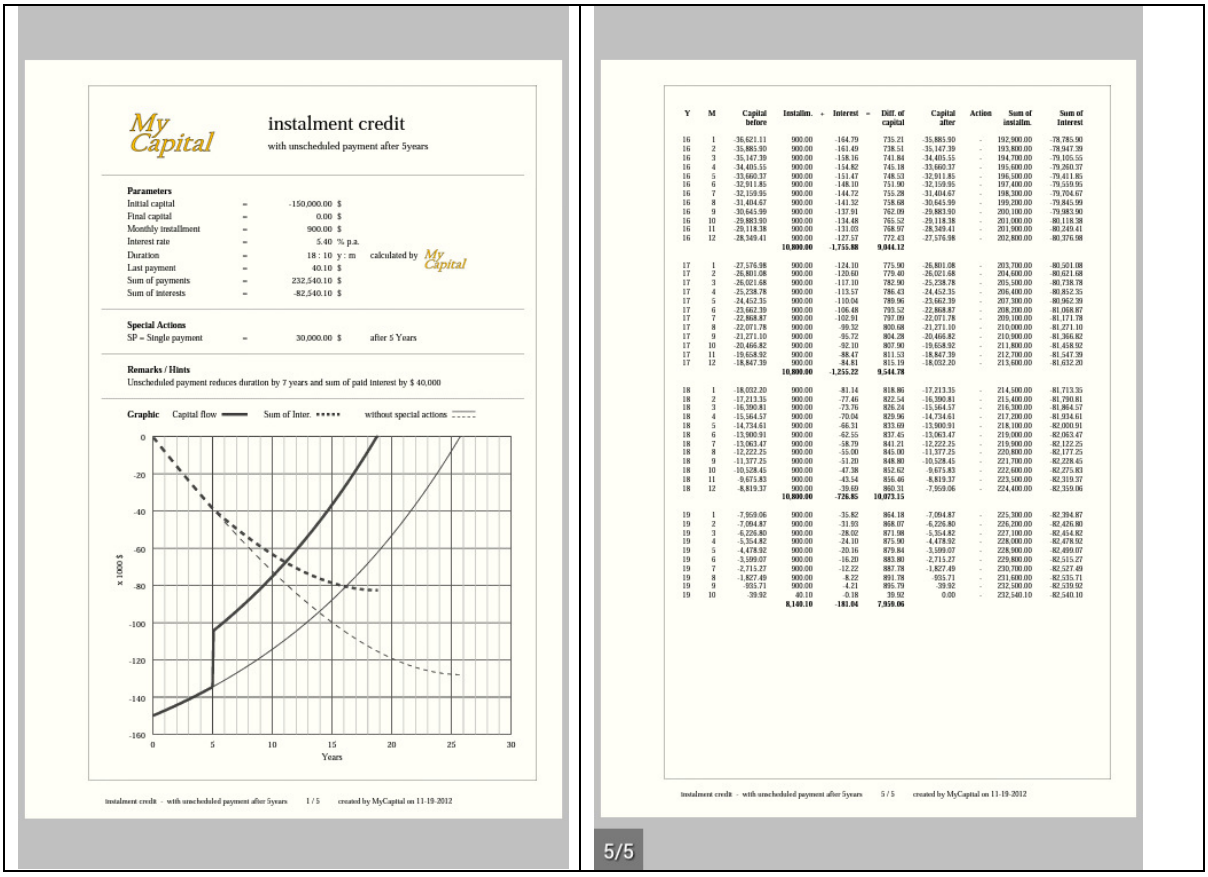
Title, Subtitle:
Please enter a title and a subtitle fort he PDF header here. Pleas note the limitation of the strings.

Checkbox „Show curves without special actions for comparison“
This option you can use when having active special actions in your case and want to compare the curves with and without special actions. If you feel confused by too many curves – just switch this option off.

Create and view PDF
With this button you create a PDF including the following parts

- List of parameters
- List of special actions
- Free text(hints from screen PDF)
- Graphis for the flow of capital and interest sum (as in screen Graphic)
- Payments plan (as in screen Plan)
  Yearly sums for für instalment, and interests

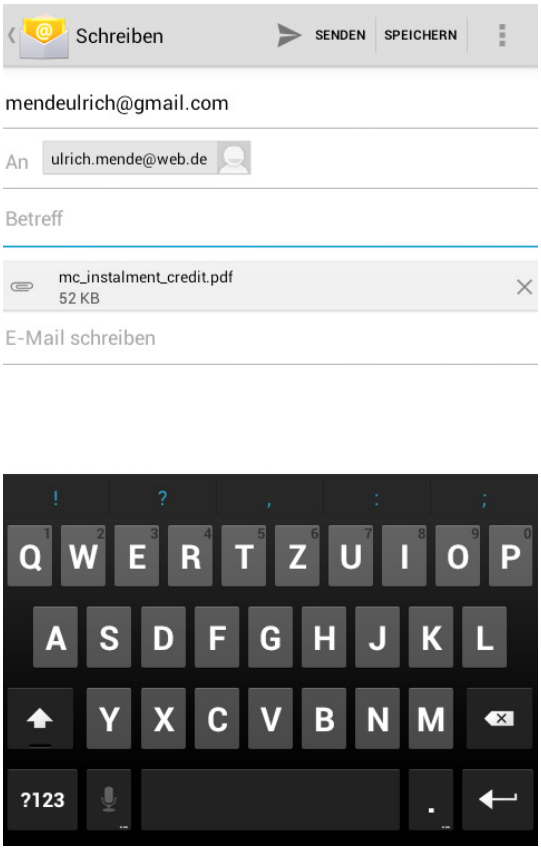
All input on screen PDF is saved together with your case and reread when loading the case again.



First and last page of a PDF

Mail PDF

The mail client is opening, having the new PDF file as an attachment. The default mail receiver from screnn “Settings” is taken as the receiver. Just press “Send” and you will have the PDF on your mal account seconds later.



Mail client for sending a PDF via mail

4 Using MyCapital

4.1 Setting up the parameters

Just one of the 5 input parameters of your process can be calculated. Mark the desired target field with the radio button on the left. An input in the target field of the calculation is not necessary. On the other hand there is no need to clear the field before calculation. The other four parameters have to be filled before calculation. Please note, that “0” is often a valid value.

Please be always aware:

The account is yours, so

- Positive capital is good, it brings you positive interests
- Negative capital is bad, you will have to pay interests to the bank, which will decrease your capital furthermore,
- Positive installments are good; they will increase your capital or at least decrease your debt.
- Negative installments are bad, they will decrease your capital (dissave)

In the following cases installment and interests will work against each other:

- Positive capital (= positive interests) and negative installment(dissaving)
- Negative capital (debt, negative interests) and positive installment (= amortization)

4.2 Choosing examples and fitting them to your needs

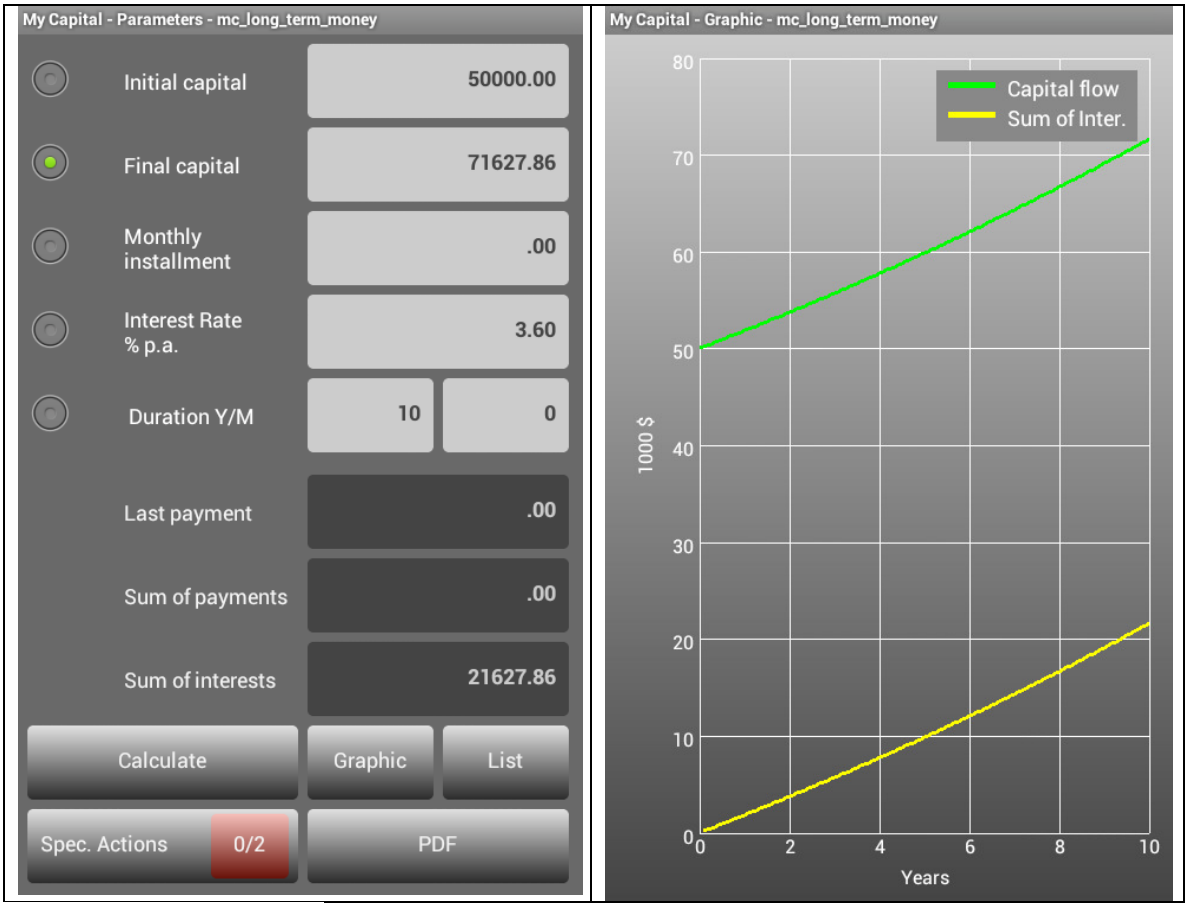
The app provides examples for all basic processes. These examples are build-in, so they cannot be overwritten accidentally.
Use these examples if you are new to financial processes and the involved parameters. You will quickly get a good understanding what MyCapital can do for you. Already after a short time you will have an aha-experience.

Play around with these examples, change there parameters, change the calculation target. Ask yourself simple questions and let MyCapital answer them:

What happens if I double the installment?
How much will I have to pay monthly, to get 100.000 within 10 years?

4.2.1 Example 1: Long Term Money with zero installment

You want to invest $ 50,000 by 3.6% p.a. for 10 years fix. How many interests will you get?



Example 1: Long Term Money

Input:

- Initial capital = $+ 50,000
- Final capital – will be calculated (Radio button green)
- Installment = 0
- Interest rate = 3.6 % p.a.
- Duration = 10 years

Result:

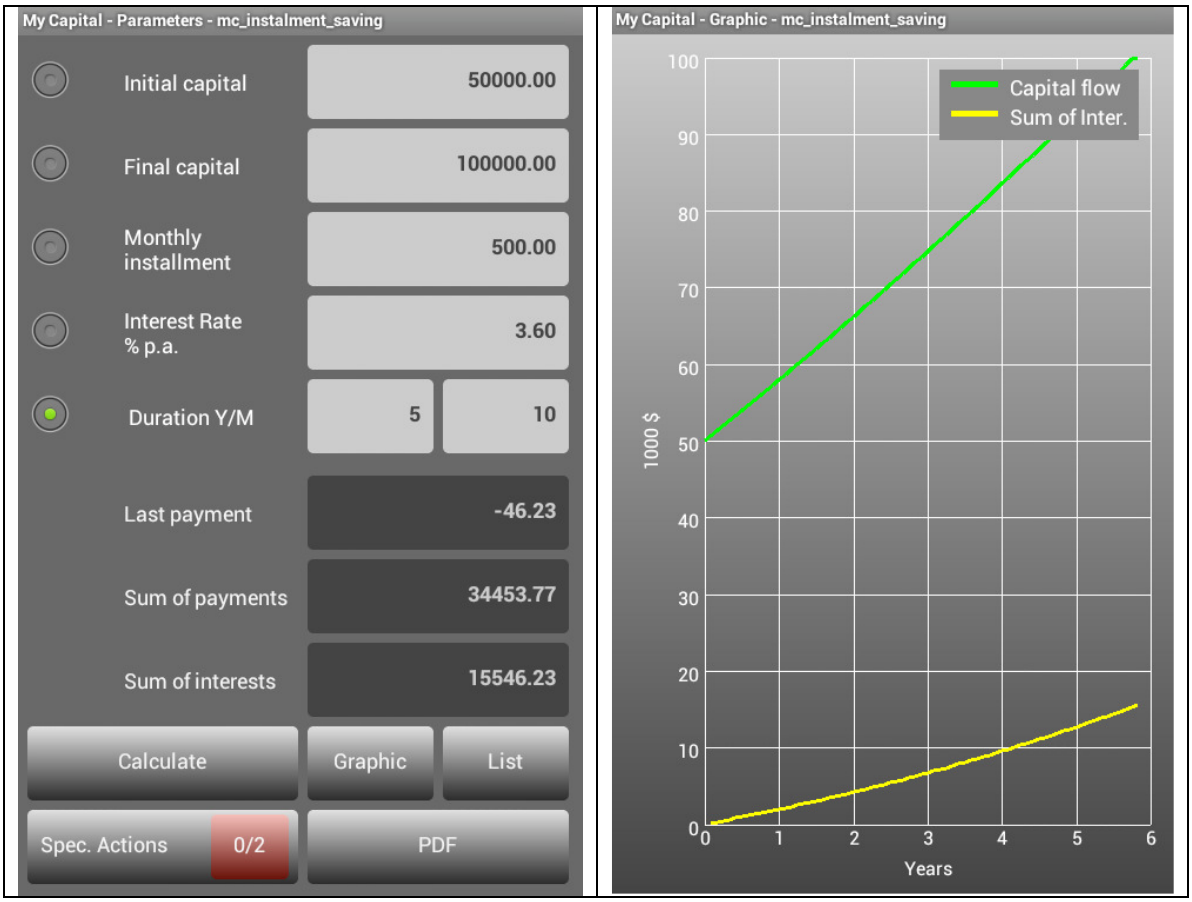
- Capital will rise with a small acceleration, caused by interests on interests. The same is valid for the sum of interests.
- Curve of capital and curve of interest sum are parallel because of missing deposits. So your capital will grow up as fast as the sum of interests you got.
- Sum of interests = $ 21,627.86
  (Without interests on interests it would be $ 50,000 *3.6% /year* 10 years = $ 18,000)

Possible additional questions:

- Which interest rate you would need to get the same result after 7 years already??
- How long would it take (under the same circumstances) to get a final capital of $ 100,000?

4.2.2 Example 2: Installment savings with given target value

Starting from $ 50,000 you make a monthly deposit of $ 500. When will a final capital of $ 100.000 be reached?



Example 2: Installment saving witch given target capital value

Input:

- Initial capital = $+ 50.000
- Final capital = $ +100.000
- Rate = $ +500
- Interest rate = 3.6 % p.a.
- Duration: will be calculated (green radio button)

Result:

- Capital rises much quicker than in the last example because of simultaneously adding deposits and interests.
- Capital curve and sum of interests are not parallel any more.
- Duration is 5 years and 10 months.
- The last installment differs from the others, because MyCapital will exactly calculate a duration auf 5 years, 9 months and some days.
- The sum of installments is $34,453.77 $= (5 *12 +9) * $ 500+ $- 46,23

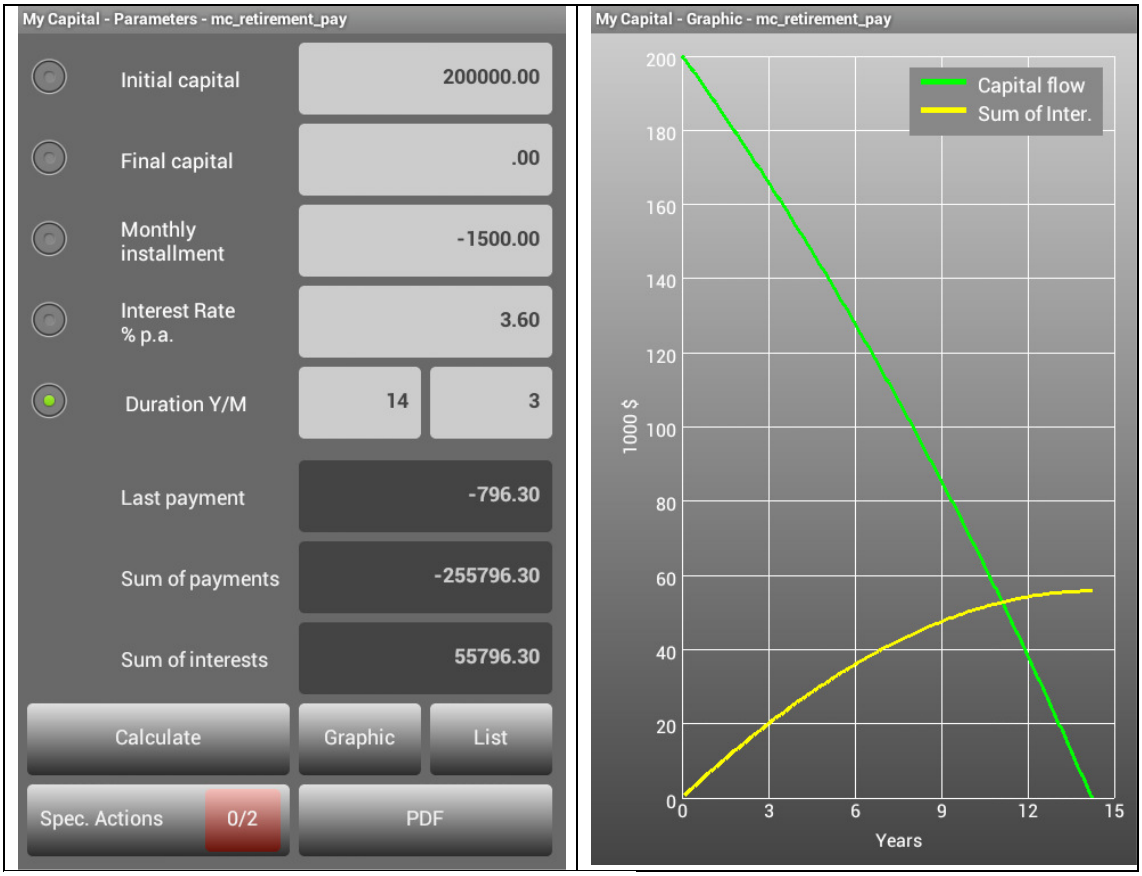
Possible additional questions

- Which installment would you need to get the same final capital after three years already? A few clicks for MyCapital…

4.2.3 Example 3: Retirement pay with a given monthly installment

One man saved $ 200,000 for a retirement pay to himself starting with an age of 65.

Question: After which time his capital will be consumed when taking $ 1.500 each month?



Example 3: Retirement pay with given monthly installment

Input:

- Initial capital = $+200.000
- Final capital = $ 0
- Installment = $ - 1500,00 $ (negative, because withdrawal)
- Interest rate = 3.6 % p.a.
- Calculation target: Duration (green radio button)

Result:

- Capital decreases first slowly than faster and faster down to zero final capital after 14 years and 3 months. The man will be 79 years old then.
- Sum of interests is always positive, because the bank pays interests to the man's account. Sum of interests is rising fast at the beginning and then slower and slower until capital is zero.
- The last installment differs from the others again, because the mathematic exact duration is higher than 14 years and 3 months. If you change the calculation target to "Installment" you will see, that the exact installment for exact 14 years and 3 months is: $ 1,496.84. In this case all installments are the same, including the last one.

Typical additional questions:

- Cash dividends saving: you extract a (negative) monthly installment which is just as high as the monthly interests are – your capital will stay constant.

4.2.4 Example 4: Installment credit with given monthly installment

You want to pay off a credit of $ 150,000, interest rate = 5.4% p.a. by a monthly installment of $ 900.
Questions:

- When will the process finish?
- How many interests will you have paid then?

Example 4: Installment credit with given monthly installment

Input:

- Initial capital = $-150000 (negative, debt)
- Final capital = $ 0 (debt should be decreased to zero)
- Installment = $ 900 (positive, because of back-pay)
- Debt interest rate =5.4 % p.a. (Interest rate is positive, but interests are negative because of negative capital)

Result:

- Capital rises first slowly (high interests on high debt), then quicker until the whole debt is paid back.
- All interests are negative because of negative capital. Interests are taken from installment, so that only a part of it will really decrease the debt.
- A total of nearly $ 127,882.61 of interests will be paid to the bank in these 25 years. Be aware, that this is nearly the whole credit value!

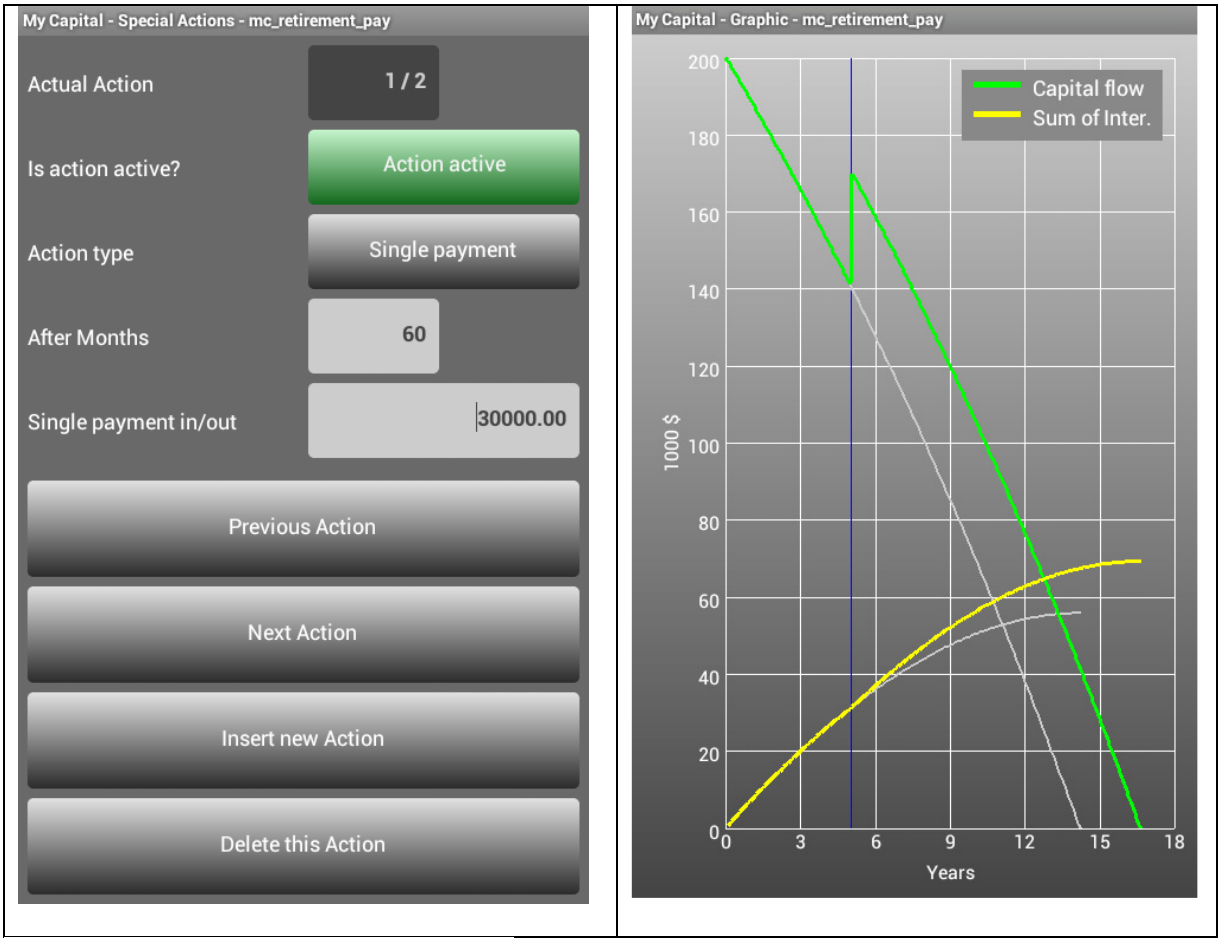
Typical questions for back-paying a credit with given credit value and interest rate

- How many interests can I save by increasing the monthly installment to $ 1,200?
- Which will be the credit value if I don't want to pay more then $50,000 of interests?
- How could a Special Payment of $30.000 after 5, 10 or 15 years influence the process? How many interests would this save? How about the duration?

4.2.5 Example 5: Retirement pay from example 2, special single deposit

The man from example 2 is not satisfied by the 14 years he is able to extract his retirement pay. On the age of 70 years, he sells his property and deposits the $ 30,000 directly into his account.

Question: How long can he get his retirement pay now?



Example 5: Retirement pay with special deposit

Additional input:

- Special Action:
  - Active (IMPORTANT, otherwise this action will not be taken in account!)
  - Type = single payment
  - Time: after 60 months = 5 years
  - Value = $ 30,000

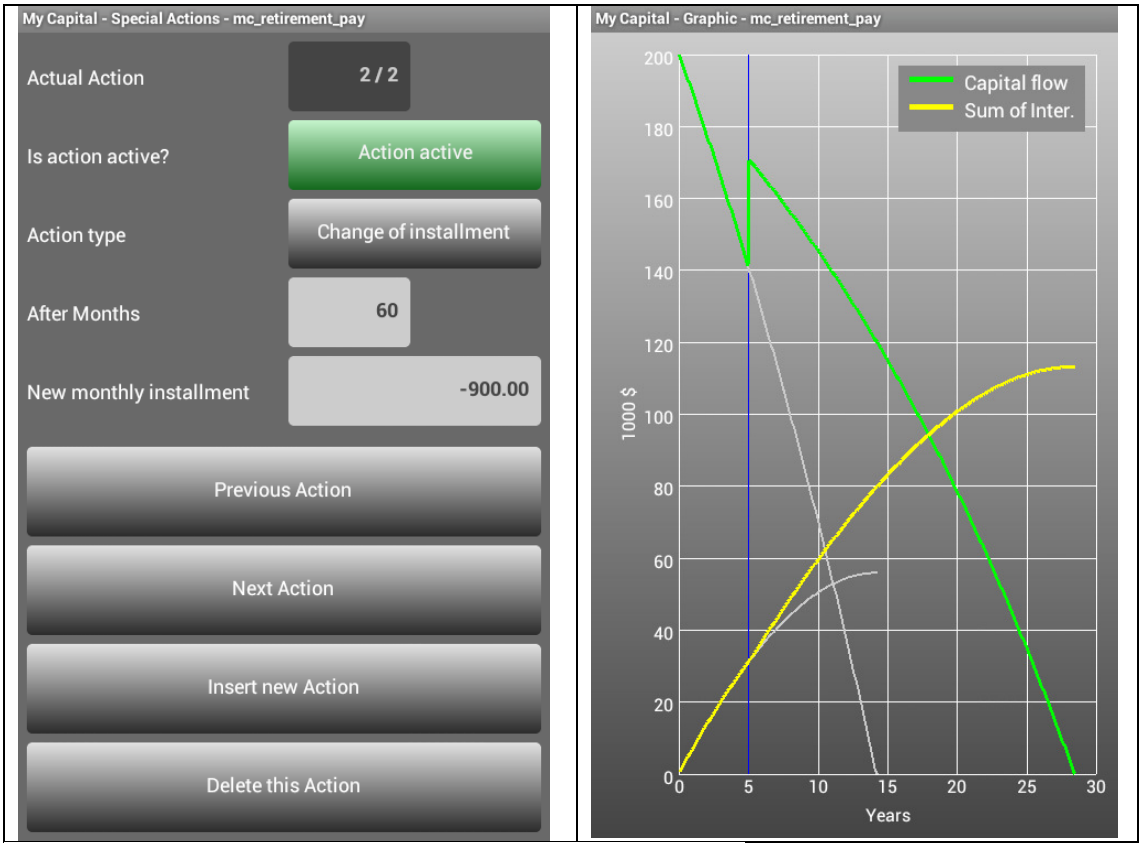
Result:

- The capital curve jumps up by $ 30,000 after 5 years
- The curve fort he interest sum has an upwards kink at that time.
- The duration rises up to 17 years. The man will be 82 years then.
- The gray curves show the flow without the special payment.

4.2.6 Example 6: Retirement pay from example 5, decrease of installment

The man from example 4 wants to withdraw money for more than 17 years. He is a sportsman and hops to live longer, at least up to 85 years.
He decides to lower the installment to $ -900 rate in order to increase the duration of the process.

Question: How long will the process last now?



Example 6: Retirement pay with change auf installment after 5 years

Additional input:

- Special action 2:
  - Active
  - Type = New installment
  - Time: after 60 month = 5 years
  - Value= $ -900

Result:

- The capital curve is sinking much slower now because of the smaller installment
- The sum of interests gets more buckled
- Duration is nearly 28 years now.
- The gray curves show the flow without adjustment of installment and the special payment.
- When the man will be 85, that means that 20 years after process start, he will still have $ 80,000 left.

Additional questions:

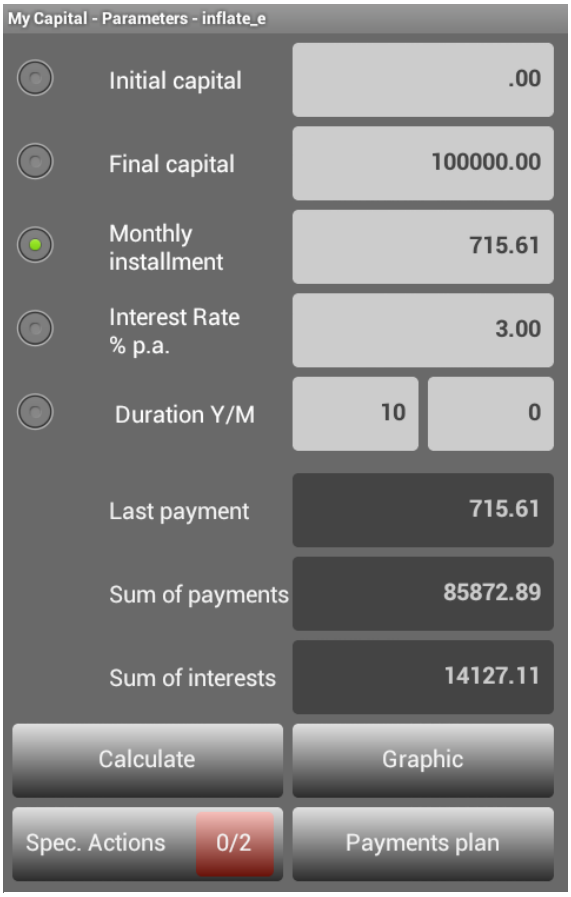
- How long would the process run if he lowers the installment only after 10 years?
- Which influence would have a decrease of the interest rate after 10 years from 3.6 % p.a. down to 2.5% p.a.?
- If the man would take $10,000 after 15 years for a new car – what would this mean to the process?

4.3 Compensation of Inflation (CoI)

For long term processes it is absolutely necessary to take inflation into account. If you are saving for $ 100,000 for 10 years, then $ 100,000 will have much lower buying power at process end.
The yearly inflation rate tells us, how many percent the prices will rise in a year. If the inflation rate is 2 % p.a. so you will have nearly 20% higher prices after 10 years already. (Really it is a little bit more because of an interests-on-interests-effect. The increase of the prices are counted with respect to the already increased prices from last year) So, after 10 years the prices would rise up to a value of 1.02^{10} = 1.22 = 122%)
These 22 % price increase on the other hand mean a decrease of buying power to 1/1.22= 82%. Your $ 100,000 will have a buying power of $ 82,000 in 10 years only.

4.3.1 CoI for saving processes

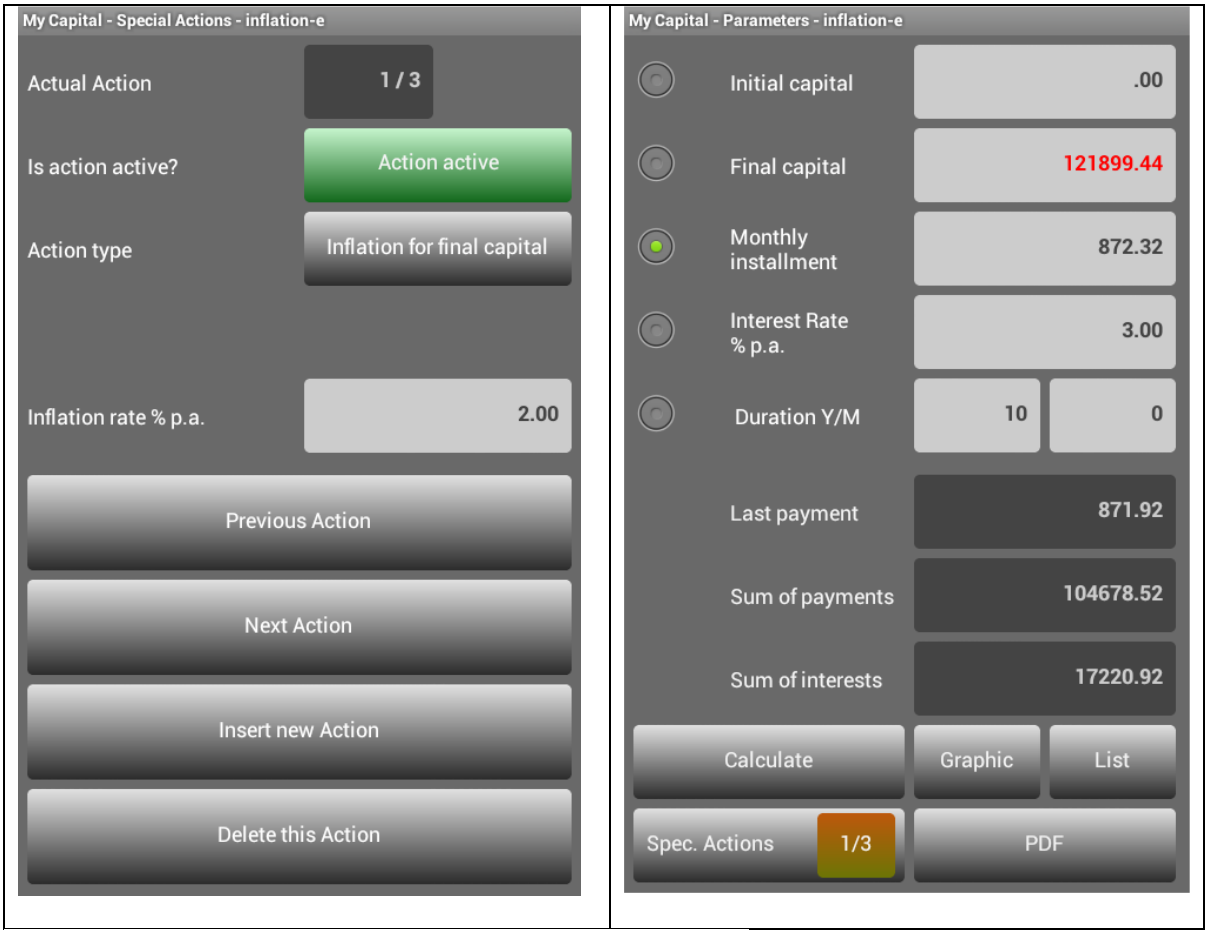
In saving processes the whole final capital will be taken from the account at the end of the duration. CoI is done with respect to the final capital and the end date of the process, therefore. MyCapital simply fits the final capital (when given) to the inflation rate. In the above example we would therefore use a final capital of $ 122,000 instead of $ 100,000. In MyCapital this can be done via a Special Action “Inflation of final capital” Only the inflation rate has to be entered for that Special Action, an exact date, on which it takes place, is not needed, since it is valid for the whole process. The result will be a higher duration or a higher monthly installment.



Calculation of installment for a saving process without CoI

CoI for final capital, calculation target „Initial capital“, „Installment“ or „Interest rate“

In this case final capital (without compensation of inflation) and process duration are given. My Money calculates the final capital with respect to inflation *before* the process calculation. If the final capital is shown in red color then the CoI is active. If the Special Action for CoI is switched off again, the original final capital, i.e. the $100.000 in our example, is restored and the color is set back, too.

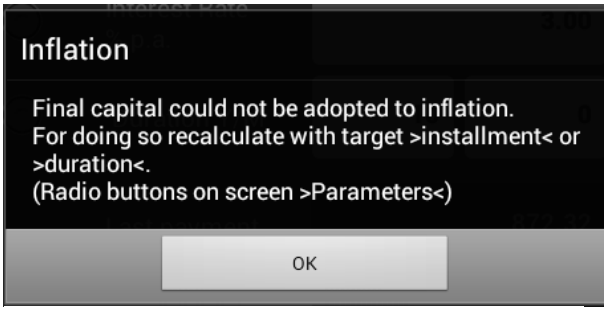


Saving process with calculation of installment, including CoI (2% p.a.)

The installment needed when using CoI will be 20% higher than that without CoI. This is relevant and may not be disregarded therefore.

CoI for final capital, calculation target „Duration“
In this case the final capital with respect to CoI cannot be calculated before process calculation, because the duration is unknown. MyCapital must calculate duration and final capital together in a stepwise (iterative) algorithm. The result are the CoI-final capital and the corresponding duration.

CoI for final capital, calculation target “Final capital”
Even if CoI is switched on, the final capital for a start can be calculated without CoI only. After this a message is shown that recommends the user to switch calculation target to „Installment“, or to „Duration”. Thereby the just calculated final capital will be corrected to CoI and a different Installment or process duration will be calculated.



Message Box for CoI, calculation target “Final capital”

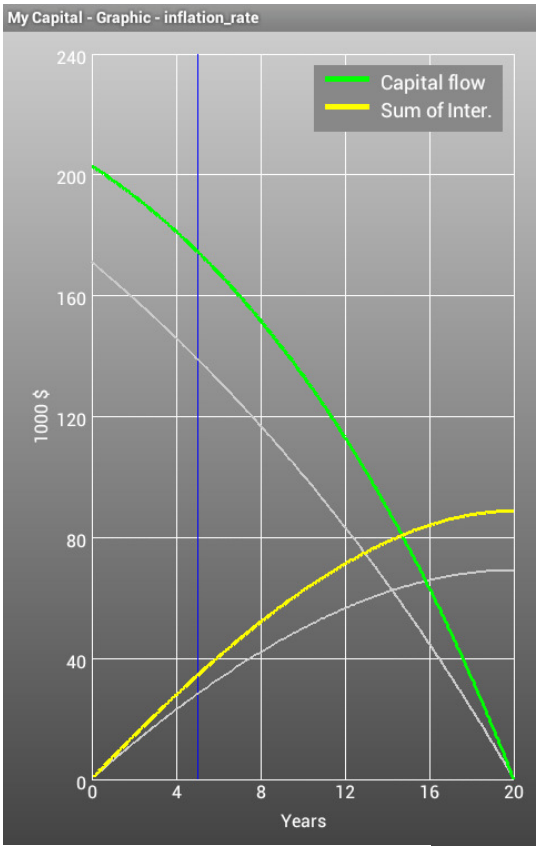
4.3.2 CoI for dissaving processes

With saving processes, the whole capital is taken from account at the end of the process. CoI therefore works with respect to that moment.
From a retirement installment process the capital is taken monthly in contrast. In this case it is required to adjust the installment to inflation at least every year.

So, if (at a given inflation rate of 2% p.a.) the installment is $ 1000 at the first year, in the second year it should be $ 1020, in the third 1040 and so on. After 20 years the installment has increased to $ 1.480 already. The consequence is a shortened duration or a higher needed initial capital on the other hand. The CoI for the installment of a dissaving process can be set up by a Special Action: „Inflation of installment“.

Dissaving process without CoI (left) and with CoI (right) of installment.

In the right picture please notice the value of the last rate of $ 1456. Since there were exactly 19 times of adjustment of the installment, this value equals to 1,000 $ * $(1.02)^{19}$ = $ 1,456.81. If you switch off the Special Action for CoI of installment, then the previous calculation values with constant installment will be restored.



Capital flow for retirement pay with CoI

Comparing the capital flow for retirement pay with and without CoI, you can see that the green curve has to start at a higher initial value then the gray curve because of the higher withdrawals you take from your account. Again, because of the increasing installments the green curve falls quicker to meet with the gray curve exactly after 20 years at zero capital.
You must have nearly $ 30,000 more capital at process start, but this money is not lost. Your sum of withdrawals is $ 40,000 higher then in the case without inflation. Part of these are higher interests you will be paid.

Paying off a credit needs no CoI, since debt is good for inflation.

4.4 Combined processes

Sometimes it can be necessary to deal with two processes, following each other, but different in type. Typically this is a saving process, directly followed by a connecting dissaving process.

Example:
A man starts a saving process on age of 50 to pay himself a retirement pension from 65 years until he will be 85 years old.

1. Process = saving part

Initial capital=	50.000 $
Final capital =	Initial capital of second part = ?
Installment =	?
Rate of interest=	2.5% p.a.
Duration=	15 years

2. Process = dissaving part (retirement pay)

Initial capital=	Final capital from first part = ?
Final capital =	0
Installment =	$ - 1345 (= $ 1000 with CoI by 2% p.a. for 15 years)
Interest rate=	3.5% p.a.

Duration= 20 years
Rate of inflation= 2 % p.a.

In fact, the man wanted a withdrawal of $ 1000, but knew, that this $ 1000 would not have the same buying power in 15 years as they have today. So he starts the calculation of the second part with an (initial) withdrawal of - $ 1,345, what equals to $ 1000 * $(1.02)^{15}$. Within the following 20 years of the retirement pay this installment will be CoI-corrected itself.

Calculation of the two-part-process:
First you calculate the needed initial capital of the second part to $ 274,816. Please note, that the installment after 20 years will be increased to $ 1,959, what is nearly the double as the $ 1000 (today).

After that you calculate the installment of the saving process, giving you a final capital of just $ 274,816 within 15 years and 2.5% p.a. Result: $ 926.
The final value of the first part is already CoI-corrected by the high value of the retirement pay in the second part. So no further CoI is needed here.

Hint:
It is essential to start the calculation with the second part, because the first part has two unknown parameters: final capital and duration. But a process can have only one unknown parameter (= calculation target)

With the second part this is the case: It hast only the initial capital as unknown parameter, the other four parameters are given. The calculated initial capital of part two determines the final capital of part one. So part one is now ready for calculation.