

Oorerwing / Inheritance

Vir die vorige week se prakties moes jy klasse skryf wat inligting oor beide spaarrekenings en kredietrekenings bestuur.

Hierdie twee klasse het 'n aantal voorkomsveranderlikes en metodes in gemeen. Verder is daar ook metodes in die twee klasse met dieselfde naam (en parameters) maar waarvan die implementerings verskil. Maak gebruik van oorerwing van een of meer superklasse om soveel moontlik kode te hergebruik. Geen kode of voorkomsveranderlikes mag gedupliseer word nie! Daar moet 'n *interface* asook 'n abstrakte superklas wees.

Alle programme moet aan die koderingstandaard voldoen. Gebruik die program **TestAccounts** om jou klasse te toets, die uitvoer moet soos hieronder lyk.

For the practicals of the previous week you had to write classes to manage information of both savings accounts as well as credit accounts.

These two classes have a number of instance variables and methods in common. Furthermore, the two classes also have methods with the same name (and parameters) but which have different implementations. Make use of inheritance of one or more super classes to ensure the re-use of as much code as possible. No code or instance variables may be duplicated! You need to have both an interface as well as an abstract superclass.

All programs must comply with the coding standards.

Use the program **TestAccounts** to test your classes, the output must be as given below.

Spaarrekening / Savings account

'n Spaarrekening verdien rente indien die saldo groter is as die minimum saldo. Voeg die volgende metode by die spaarrekening klas van laas week se prakties:

calculateInterest wat rente soos volg bereken:

$$r = \begin{cases} 0 & \text{as } s < m \\ s * k/100 & \text{anders} \end{cases}$$

waar r die rente verdien is, s die saldo, m die minimum saldo en k die rentekoers is. Die parameter van die metode is die rentekoers (as 'n heelgetal) vir die rekening. Die metodes stuur die rente verdien (as 'n heelgetal) terug aan die roepende program.

A savings account earns interest if the balance is greater than the minimum balance. Add the following method to the savings account class of last week's practical.

calculateInterest must calculate the interest earned as follows:

$$i = \begin{cases} 0 & \text{if } b < m \\ b * r/100 & \text{otherwise} \end{cases}$$

where i is the interest earned, b is the balance, m is the minimum balance and r is the interest rate. The parameter of the method is the interest rate (as an integer) for the account. The interest earned (as an integer) must be returned to the calling program.

Kredietrekening / Credit account

Voeg die volgende metode by die kredietrekening klas van laas week se prakties:

calculateInterest wat rente soos volg bereken:

$$r = \begin{cases} s * 4 * k/100 & \text{as } s < l \\ s * 2 * k/100 & \text{as } l \leq s < 0 \\ s * k/100 & \text{anders} \end{cases}$$

waar r die rente verdien of betaalbaar is, s die saldo, l die oortrokke limiet en k die rentekoers is. Indien rente positief is, is dit rente wat verdien is terwyl 'n negatiewe waarde rente betaalbaar is. Die parameter van die metode is die rentekoers (as 'n heelgetal) vir die rekening. Die metodes stuur die rente verdien of betaalbaar (as 'n heelgetal) terug aan die roepende program.

Add the following method to the credit account class of last week's practical:

calculateInterest that calculates the interest earned as follows:

$$i = \begin{cases} b * 4 * r/100 & \text{if } b < l \\ b * 2 * r/100 & \text{if } l \leq b < 0 \\ b * r/100 & \text{otherwise} \end{cases}$$

where i is the interest earned or payable, b is the balance, l is the overdraft limit and r is the interest rate. If the value of interest is positive it is interest earned while a negative value is interest payable. The parameter of the method is the interest rate (as an integer) for the account. The interest earned or payable (as an integer) must be returned to the calling program.

Toetsuitvoer / Test output

Account no: 1111111111 has balance of -1000 and overdraft limit -500000 with interest: -200
Account no: 2222222222 has balance of -1250000 and overdraft limit -500000 with interest: -500000
Account no: 3333333333 has balance of 1000 and overdraft limit -500000 with interest: 100
Account no: 4444444444 has balance of 10000 and minimum balance 500 with interest: 1000
Account no: 5555555555 has balance of 100 and minimum balance 500 with interest: 0