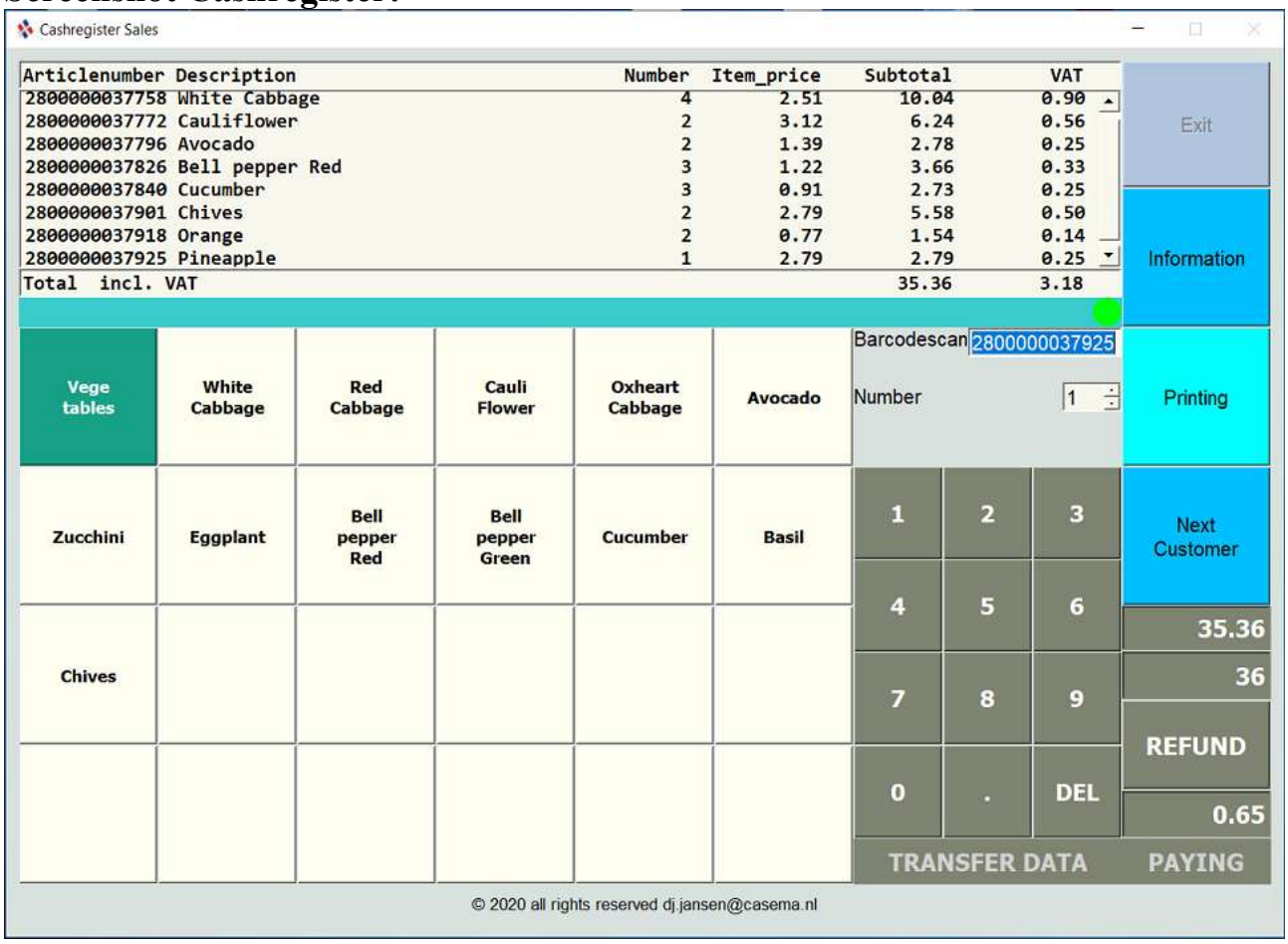
Documentation Cashregister Sales version 2.0

Screenshot Cashregister:



CashRegister system.

The system detects if a logon barcode or a product barcode is scanned.
When no logon is established processing is blocked.
The red sign in the notification bar below the display is showed.
By valid login the notification bar shows a green sign.
The logon is invisible while scanning.

With the logon from barcode accesslevel 3 a Administration button is activated. With this button and submenu accounts it is possible to generate other barcodes for logon purposes.
The barcodefield will be generated as 2 startdigits 24 (in free range EAN) , 5 random generated digits by the program and the 8th digit is a check number. The program will check and correct for duplicates. Access is default set on level 1, change if desired. If accesslevel is set to 0 processing is blocked for the employee.
The barcodelabel is saved in folder . /Barcodes/Accounts/
For testing purposes a sheet of barcodes is included. (print in high resoltulion for scanning!)
The first name, last name and callname of the employee must be inserted.
The callname field will be printed on the saleslip, it's also saved in the sales table.

With paying print the receipt if desired, with the "Printing" button, by cash paying use the modest calculator on the screen to fill in the cash payed by the customer in the CASH field and push the "REFUND" button. The change will be calculated and showed in the CHANGE field, taking into

account the rounding, which is set in advance. The customer also can pay by a pin transaction. By typing a wrong number correct with “DEL” button.
After payment is done press the “Next Client” button to make the necessary bookings and free the register for the nest customer
A notification bar is visible for displaying several notifications during operation.
A INFO button is available for information of the program.

When the account switch from level 1 to level 2 or level 3 or back the orderlines remains, so it’s possible to book return goods with accepted account. If the account switches back the spinbox is reset to it’s original state. When the login employee logs the barcode a second time, the employee is logged out.
When another employee logs his barcode, the logon is switched towards this employee.

Accesslevel 0: Operation blocked for the user.
Accesslevel 1. Normal operation. (No administration and no plusminbutton visible)
Accesslevel 2 . Expose an checkable button ± for return products. The spinrange from the spinbox changes from 1, 99 to – 1, – 99 with button checked.
Accesslevel 3. Expose the Administration button. Pressing this button reveals a combobox with 11 menulines. The items are:

Accounts submenu	*New account* *View / change account*
Articles submenu	*Insert new articles* *View / change articles* *Booking loss articles* *View loss articles*
Purchase submenu	*Collecting purchases* *Unknown supplier ordering* *Receiving / processing deliveries* *Ordering suppliernumber suppliername* *Ordering suppl……..* *……..* *To order yet - view* *Ordered – view* *All orders – view* *Delivered orders - view*
Suppliers submenu	*Suppliers new* *Suppliers view / change* *Invoices suppliers /paying*
Imports submenu	*Import new articles* *Import price changes* *Import expired articles* *Import deliveries articles*
Payments view / pay	
Parameters view / change	

Sales – view

Turnover submenu – view
Daily gross turnover
Monthly gross turnover
Yearly gross turnover

Reprint purchase orders

Reprint sales receipts

Accounts submenu:

The first name, last name and callname of the employee must be inserted.
The callname field will be printed on the saleslip, it's also saved in the sales table.

The barcodelabel is saved in folder . /Barcodes/Accounts/ after inserting a new employee, a barcode can be printed for logon in the menuchoice View / change Account with the print button.
Before printing remove the number under barcode for security reasons and replace by logon name. (For instance use application Paint)
By the menuchoice "View / change Account" click the first field of the list with employees to select.

Articles

The table articles helds a column barcode (String 13 positions).
By inserting a new article a ean 13 barcode is generated. The first 2 digits are in the free EAN range 28. The following 10 digits is the generated serial number and the last number is a validity check number.
It's also possible with inserting a new barcode to overrule the generated number with a scanned commercial product barcode. So both can coexist to each other.
When inserting by scanning fill in the form completely before scanning and place the cursor in the scanning field.
In this module a image is saved of the barcode in the folder ./Barcodes/Articles
This image can be printed for labeling the product or storage bin in the warehouse, so it's enabled for scanning.
With the program Sales, the sales can be established by scanning barcodes.
The amount can be set with the little spinbox. The amount can be filled with the little arrows, or turning the mouseweheel on the field. The amount can be set from 1 to 99. The amount is default set to 1.
The module scans the barcode, looks up in the database the articlenumber, description, price and counts the subtotals and VAT. When scanning is completed, a receipt can be printed.
If a item cannot be provided with a barcode, it it possible to assign the product to a button.
Press the button, after setting the amount if more then one piece required.
See explanation under heading 'Programmable buttons'.
If scanning is not possible, in case of a damaged barcode, the barcode can be filled manually.
In this case the <Enter> must be pressed on the keyboard.

The program checks if 13 numbers are filled and checks the validy check number.
The module provides a display with heading and 8 product lines.
The lines are scrolling, if more then 8 lines are added.
Below the display screen the totals including VAT and total VAT is displayed.

If the thirst scan is established the close button is blocked, until next client button is pressed.
Printing of the order is possible until the button next client is pressed.
In the print module the total price and total VAT is counted and printed in the tail heading.
After the next client button is pressed the print button and the next client button is blocked, until the first scan for the next client is established. By scanning the table sales is filled with the receipt number, article number, description, amount, price, subtotal and subVAT, also in the table articles the stock data is updated and the annual_consumption is increased.
With pressing the next client button the table afdrachten (payments) is filled with the totals of VAT.

By scanning is checked on 5 error conditions:

1. The checksum of the barcode is wrong. (wrong barcode or damaged)
2. The product is not in the range of the company.
3. Too little stock for the orderline.
4. Error message if not logged on.
5. Operation blocked for this user.

The errors are showed below the product display in the color red.
With choise 3, also the amount of current stock is showed.

For return goods a ± button is added.
This button is visible if the logon barcode is valid as code 2 or code 3 . See **Accounts.**
If the button (checkable) is set on – the spinbox range change from -1 to -99.
The logon can be switched from access 1 to access 2 or 3 and back with remaining of the orderlines, so it's possible to book return goods by a competent person.

Articles Request/change

General remarks:
It is important to pay particular attention to the completion of the fields, for reasons of clarity and stock control.
Always fill in description and surely in the start-up phase the order-size and minimum stock. When the system builds a history of usage, the system calculates the items minimum stock and order-size
In the table articles, the columns minimum stock, category, order_size, order_status, order_balance, annual_consumption1 and annual-consumption2 are available for stock control.
We will explain the purpose of these columns.
The minimum_stock is used for purchasing, if item_stock + order_balance < minimum_stock a orderline is generated. These orderlines are generated in the "Purchase submenu" Collecting purchases.
If the purchase orderlines are collected the field order_status is set to False, so no further orders are generated until the products are delivered. The order-balance is increased with the ordered number.
After delivery the field order_status is reset to True, so the product is released for calculations of stock, order_balance is decreased and item_stock is increased with the delivered number.
The column category determines the delivery time. The category runs from 3 days to 1 year in 8 steps and 1 category daily fresh products. The latter is outside the supply system and must be handled manual.
Minimum stock is calculated on base of annual_consumption and category (delivery time).

The calculation of the items is established by the Camp formula:

Camp formula: $Q = \sqrt{2DF/HP}$

Stands for:
Q = Quantity

- D = Demand / year (table articles)
- F = Fixed Costs (order costs conversion costs) (from table params)
- H = Stock costs as a percentage of the price (from table params)
- P = Price of the product (from table articles)

The annual_consumption is counted by the article usage in a year.
With every issue of products the annual_consumption is increased.

Even year annual_consumption_1
Odd year annual_consumption_2
By starting of a new year the oldest year of annual consumption is set to 0, so the counting restarts, with the column, so always the last year is preserved for calculation of stock.

You can influence the order size by changing the paramID 5 and 6.
(Ordercosts and surcharge for interest and storage)

A thumbnail picture can be showed in the articles base productlines. Place a picture as a png file 80 x 80 pixels in folder thumbs (use Paint for scaling and save as png) and set the path in the field thumbnail as ./thumbs/<name of picture> It is possible to make subfolders with picturegroups in the folder thumbs, for organisational reasons.

The other menu choices are for changing articles, booking loss articles, and view loss articles.
Loss articles are divided in obsolete, warehouse differences, damaged or shelf life.

Clicking on the first field of the tableview opens a form loss.
With this form the warehouse differences, damaged products, obsolete products or shelf life products can be written off. Fill in number of products and choose category of loss. The products are booked in the table loss and reduced from stock.

Purchase submenu

Collecting orderlines.
The menuchoice iterates the whole table articles and generate based on contents of the fields item_stock, minimum_stock, order_balance, order_status and category the orderlines.
The list is stored in the table purchase_orderlines, with the clientnumber if known.

Unknown supplier ordering
Represents the products with no supplier known in the articlebase.
The menuitem opens a list of productlines.
Click on the field of listitem to order, fill in the suppliernumber and print the order.
Follow the procedure for the whole list.
The ordered number and date of ordering and supplier are stored in the table purchase_orderlines
The suppliernumber is also stored in the articles table.

Ordering suppliernumber suppliername
These lines are represented by suppliernumber + suppliername
The ordering is realised as a collection per supplier.
To order push the Print /Order button on the list per supplier.
A orderlist per supplier is printed.

Follow the procedure for all lines in the range.
The ordered number and date of ordering and supplier are stored in the table purchase_orderlines

Receiving / processing deliveries
The menuline calls all orderlines.
By clicking on the first field of the listed items a form is showed, where the delivered number can be processed. The field item_stock is increased, the field order_balance is reduced and the field order-status is reset in table articles
The delivered number is added and date of delivery is stored in the table purchase_orderlines.
View lists for all orders, still to be ordered, ordered and delivered orders are present.

Suppliers
Suppliers new
The zip field is not coupled with check tables, because so many variations over the world exists.
A textform is included for country like requirements like VAT numbers, chamber of commerce numbers and so on (1000 positions possible)

Suppliers view / change
For changing items above.

Invoices suppliers /paying
These items are booked in table invoices after delivery.
The form includes a checkbox to check if invoice is received and approved to pay.
By checking this box the payment is booked with the paydata. After this booking is done the checkbox is disabled for checking and the text from the box is changed in payed.

Imports
Imports are done by csv files. (most used import standard)
The program determines if headings are present in the importfiles and skips the heading, if provided.
All the present files in the concerning folder will be treated in one go.
If the files are processed, they are moved to same subdirectory under ImportsDone.
To import files must be stored in the folders ./forms/Imports under New, Prices, Expired and Deliveries for processing.

Import new articles
Articles that have to be added to the table articles
If errors occur – the errors are saved in a file sales_import.log in your home directory (Windows: /users/<username>,
Linux: /home/<username>

Import price changes
Articles with changed prices. The item_price is changed in table articles.
If errors occur – the errors are saved in a file sales_import.log in your home directory (Windows: /users/<username>,
Linux: /home/<username>

Import expired articles
These articles must be removed. The article records in the file are deleted from table articles.
The deleted products are stored in table loss as Obsolete.

If errors occur – the errors are saved in a file sales_import.log in your home directory (Windows: /users/<username>,
Linux: /home/<username>

Import Deliveries articles
Number of delivered products is increased by item_stock in table articles, the order_status is reset to True and the order_balance is deducted by the delivered number.
Purchase_orderlines fields delivery and delivery_date are updated.
If errors occur – the errors are saved in a file sales_import.log in your home directory (Windows: /users/<username>,
Linux: /home/<username>

Remark by imports:
It will be clear that imports are far more efficient then manual processing.
Soo it is worth the effort to ask your suppliers to operate with the importlists. Mind the layout of the files matches exactly.

Payments Request/Paying

With this menuchoice a tableview from the payments towards instances sorted on not payed and receiptnumber is shown.
With this menuchoice is it also possible to book a payment towards instances by clicking on the thirst field from the payments request tableview. This action opens a payform with a checkbox pay. By checking this box the payment is booked with the paydata. After this booking is done the checkbox is disabled for checking and the text from the box is changed in payed.

Programmable Buttons.
Accessable with the admin button (Level 3)

There are up to 8 buttongroups each with 23 programmable buttons with the thirst button (colored differently) as a group button to switch between the buttongroups .
The groupbuttons can be provided or changed with your proprietary grouptext in the table params paramID 8 – 15, for groups 1 to and included 8.
Buttontext until 10 positions (plus one linefeed) per line over maximum 3 lines.

Besides the buttontext also the buttoncolor foreground and background can be chosen.
https://htmlcolorcodes.com/ is a site where it's very easy to chose the right color with a slider and a cross movable with your mouse.
You see the hex color right copy and paste in the color field of the buttonform, don't forget to add # before the colorcode.
If no colorcode or wrong code is chosen the default color is applied #F8F7EE.

It is possible to change the number of buttonpages from 1 to 8.
Change in params the value in 1 for the buttonpage, following on the stop page. For instance if you change for buttongroup 4 the field value in 1, you get 3 pages of buttons. To undo this action change value back to 4 and you will have 8 pages of buttons. The changes become visible after a restart of the program. In this way you will be able to use from 1 to 8 buttonpages.

Productbuttons:
If logged on as administrator and after refreshing the display, the buttons shows the buttonnumber and the linked barcode if provided. When clicking the button, the articles table is showed. Browse to the wanted product to link and click on the first field, the product is chosen for linked product and a buttonform for the clicked button opens. Besides the buttontext also the buttoncolor fore-ground and background can be chosen. https://htmlcolorcodes.com/ is a site where it's very easy to choose the right color with a slider and a cross movable with your mouse.
You see the hex color right copy and paste in the color field of the buttonform, don't forget to add # before the colorcode.
If no colorcode or wrong code is chosen the default color is applied #F8F7EE.
The buttontext is until 10 positions per line (plus one linefeed) over maximum 3 lines.
If a button with a existing text is choosen the text is replaced and the button is linked towards the new barcodenumber.
The new buttontext becomes visible after refreshing the buttonpages.

Parameters.

With this menuchoice a tableview from the params table sorted on paramID is shown and with clicking on the thirst field you can change item and value and for the groupbuttons buttontext and colors and number of buttonpages. (See "Programmable Buttons")
Parameters:
VAT low: as a factor presented percentage change if desired
VAT high: as a factor presented percentage change if desired
VAT zero is hard coded in the program as it's always 0
EVEN/ODD YEAR leave alone, for it is handled by the system.
RECEIPTNUMBER leave alone, for it is handled by the system
ORDERCOSTS PURCHASE costs of administration and handling of 1 order – change if desired
STORAGE SURCHARGE as a factor presented percentage for surcharge stock (costs for storage and loss products)
The last two items influence also the minimum-stock and order-sizes.
CHANGE rounding. The rounding of cash payments by checkout sell.
The parameters 8 - 15 are respectively for buttongroup 1 - 8, buttontext, buttoncolors and adjusting number of buttonpages. For further explanation see "Programmable buttons".

Sales – view

The viewing list of the realized sale orders

Turnover submenu – view

Daily gross turnover
Viewing daily total gross turnover + daily total VAT
Insert yyyy-mm-dd in the searchfield,

Monthly gross turnover
Viewing monthly total gross turnover + monthly total VAT
Insert yyyy-mm in the searchfield

Yearly gross turnover
Viewing yearly total gross turnover + yearly total VAT
Insert yyyy in the searchfield.

Reprint purchase orders
Give a list of all produced purchase orders. Pick one and print.

Reprint sales receipts
Give a list of all sales. Pick one and print.

For testing is a barcode sheet with logon codes provided in the folder ./Barcodes/employees/
A barcode sheet for products is stored in the folder ./Barcodes/Articles

Two databases are provided in the installation folder.
One filled database with approximily 38000 items for testing purposes, but not assignable to sales
One empty database to fill from scratch with your own items, only the tables for program functions are filled.

As a database system is used posgreSQL, which make it possible to use this application as a client-server application with several point of sales. I have not tested this because i don't have a network available. But with the right IP configuration this should be a piece of cake with a little knowledge of networking. The server can easily host on Linux. The application sales.py is ported and tested for Windows and Ubuntu (might work with other Linux operation systems too).

Database cashregister:

```
cashregister=# \d
                List of relations
 Schema |         Name          | Type  |  Owner
--------+-----------------------+-------+----------
 public | accounts              | table | postgres
 public | articles              | table | postgres
 public | buttons               | table | postgres
 public | invoices              | table | postgres
 public | loss                  | table | postgres
 public | params                | table | postgres
 public | payments              | table | postgres
 public | purchase_orderlines   | table | postgres
 public | sales                 | table | postgres
 public | suppliers             | table | postgres
(10 rows)
```

```
cashregister=# \d accounts
                          Table "public.accounts"
  Column   |         Type          | Collation | Nullable |        Default
-----------+-----------------------+-----------+----------+-----------------------
 barcodeID | character varying(8)  |           | not null |
 firstname | character varying(20) |           |          | ''::character varying
 lastname  | character varying(30) |           |          | ''::character varying
 access    | integer               |           |          | 1
 callname  | character varying(20) |           |          | ''::character varying
Indexes:
    "barcodeID_pkey" PRIMARY KEY, btree ("barcodeID")
```

```
cashregister=# \d articles
                                Table "public.articles"
       Column        |         Type          | Collation | Nullable |          Default
---------------------+-----------------------+-----------+----------+---------------------------
 barcode             | character varying(13) |           | not null |
 description         | character varying(50) |           |          | ''::character varying
 item_price          | double precision      |           |          | 0
 item_stock          | double precision      |           |          | 0
 item_unit           | character varying(6)  |           |          | ''::character varying
 minimum_stock       | double precision      |           |          | 0
 order_size          | double precision      |           |          | 0
 location_warehouse  | character varying(8)  |           |          | ''::character varying
 article_group       | character varying(40) |           |          | ''::character varying
 thumbnail           | character varying(50) |           |          | ''::character varying
 category            | integer               |           |          | 0
 order_balance       | double precision      |           |          | 0
 order_status        | boolean               |           |          | true
 mutation_date       | character varying(10) |           |          | ''::character varying
 annual_consumption_1 | double precision     |           |          | 0
 annual_consumption_2 | double precision     |           |          | 0
 VAT                 | character varying(4)  |           |          | 'high'::character varying
 short_descr         | character varying(20) |           |          | ''::character varying
 selling_price       | double precision      |           |          | 0
 supplierID          | integer               |           |          | 0
Indexes:
    "barcode_pkey" PRIMARY KEY, btree (barcode)
    "barcode_idx" btree (barcode)
Referenced by:
    TABLE "loss" CONSTRAINT "barcode_fkey" FOREIGN KEY (barcode) REFERENCES articles(barcode)
```

```
cashregister=# \d buttons
                              Table "public.buttons"
   Column   |         Type          | Collation | Nullable |           Default
------------+-----------------------+-----------+----------+-----------------------------
 buttonID   | integer               |           | not null |
 buttontext | character varying(30) |           |          | ''::character varying
 barcode    | character varying(13) |           | not null | ''::character varying
 fg_color   | character varying(7)  |           |          | '#000000'::character varying
 bg_color   | character varying(7)  |           |          | '#F8F7EE'::character varying
Indexes:
    "buttonID_pkey" PRIMARY KEY, btree ("buttonID")
```

```
cashregister=# \d invoices
                             Table "public.invoices"
   Column    |         Type          | Collation | Nullable |        Default
-------------+-----------------------+-----------+----------+-----------------------
 invoiceID   | integer               |           | not null |
 barcode     | character varying(13) |           |          | ''::character varying
 description | character varying(50) |           |          | ''::character varying
 delivery    | double precision      |           |          | 0
 item_price  | double precision      |           |          | 0
 item_unit   | character varying(16) |           |          | ''::character varying
 supplierID  | integer               |           |          | 0
 orderlineID | integer               |           |          | 0
 paydate     | character varying(10) |           |          | ''::character varying
 bookdate    | character varying(10) |           |          | ''::character varying
Indexes:
    "invoices_pkey" PRIMARY KEY, btree ("invoiceID")
```

```
cashregister=# \d loss
                              Table "public.loss"
  Column   |         Type          | Collation | Nullable |        Default
-----------+-----------------------+-----------+----------+-----------------------
 lossID    | integer               |           | not null |
 number    | double precision      |           |          | 0
 category  | character varying(22) |           |          | ''::character varying
 bookdate  | character varying(10) |           |          |
 barcode   | character varying(13) |           |          |
Indexes:
    "lossID_pkey" PRIMARY KEY, btree ("lossID")
    "fki_barcode_fkey" btree (barcode)
Foreign-key constraints:
    "barcode_fkey" FOREIGN KEY (barcode) REFERENCES articles(barcode)
```

```
cashregister=# \d params
                             Table "public.params"
   Column    |         Type          | Collation | Nullable |          Default
-------------+-----------------------+-----------+----------+----------------------------
 paramID     | integer               |           | not null |
 item        | character varying(20) |           |          | ''::character varying
 value       | double precision      |           |          | 0
 buttongroup | character varying(30) |           |          | ''::character varying
 bg_color    | character varying(7)  |           |          | '#FBF7EE'::character varying
 fg_color    | character varying(7)  |           |          | '#000000'::character varying
Indexes:
    "paramID_pkey" PRIMARY KEY, btree ("paramID")
```

```
cashregister=# \d payments
                            Table "public.payments"
    Column     |         Type          | Collation | Nullable |        Default
---------------+-----------------------+-----------+----------+-----------------------
 payID         | integer               |           | not null |
 kind          | character varying(25) |           |          | ''::character varying
 amount        | double precision      |           |          | 0
 bookdate      | character varying(10) |           |          | ''::character varying
 paydate       | character varying(10) |           |          | ''::character varying
 instance      | character varying(25) |           |          | ''::character varying
 accountnumber | character varying(25) |           |          | ''::character varying
 ovorderID     | integer               |           |          | 0
Indexes:
    "payID_pkey" PRIMARY KEY, btree ("payID")
```

```
cashregister=# \d purchase_orderlines
                        Table "public.purchase_orderlines"
    Column     |         Type          | Collation | Nullable |        Default
---------------+-----------------------+-----------+----------+-----------------------
 orderlineID   | integer               |           | not null |
 barcode       | character varying(13) |           |          | ''::character varying
 description   | character varying(50) |           |          | ''::character varying
 item_price    | double precision      |           |          | 0
 item_unit     | character varying(16) |           |          | ''::character varying
 item_stock    | double precision      |           |          | 0
 minimum_stock | double precision      |           |          | 0
 order_size    | double precision      |           |          | 0
 supplierID    | integer               |           |          | 0
 bookdate      | character varying(10) |           |          | ''::character varying
 ordered       | double precision      |           |          | 0
 order_date    | character varying(10) |           |          | ''::character varying
 delivery      | double precision      |           |          | 0
 delivery_date | character varying(10) |           |          | ''::character varying
Indexes:
    "purchase_orderlines_pkey" PRIMARY KEY, btree ("orderlineID")
```

```
cashregister=# \d sales
                              Table "public.sales"
    Column     |         Type          | Collation | Nullable |        Default
---------------+-----------------------+-----------+----------+-----------------------
 ID            | integer               |           | not null |
 receiptnumber | integer               |           |          | 0
 barcode       | character varying(13) |           |          | ''::character varying
 description   | character varying(40) |           |          | ''::character varying
 number        | double precision      |           |          | 0
 item_price    | double precision      |           |          | 0
 sub_total     | double precision      |           |          | 0
 sub_vat       | double precision      |           |          | 0
 callname      | character varying(20) |           |          | ''::character varying
 mutation_date | character varying(10) |           |          | ''::character varying
Indexes:
    "ID_pkey" PRIMARY KEY, btree ("ID")
```

```
cashregister=# \d suppliers
                            Table "public.suppliers"
    Column    |          Type           | Collation | Nullable |        Default
--------------+-------------------------+-----------+----------+-----------------------
 supplierID   | integer                 |           | not null | 0
 company_name | character varying(40)   |           |          | ''::character varying
 street       | character varying(40)   |           |          | ''::character varying
 housenumber  | character varying(14)   |           |          | ''::character varying
 zipcode      | character varying(7)    |           |          | ''::character varying
 residence    | character varying(40)   |           |          | ''::character varying
 telephone    | character varying(13)   |           |          | ''::character varying
 email        | character varying(200)  |           |          | ''::character varying
 addition     | character varying(1000) |           |          | ''::character varying
Indexes:
    "suppliers_pkey" PRIMARY KEY, btree ("supplierID")
```

General remarks by the used database items.

The items are not specific for retail, nor amounts and prices are realistic and for becoming real values the data should be applied to a working company and the data should be dynamic.