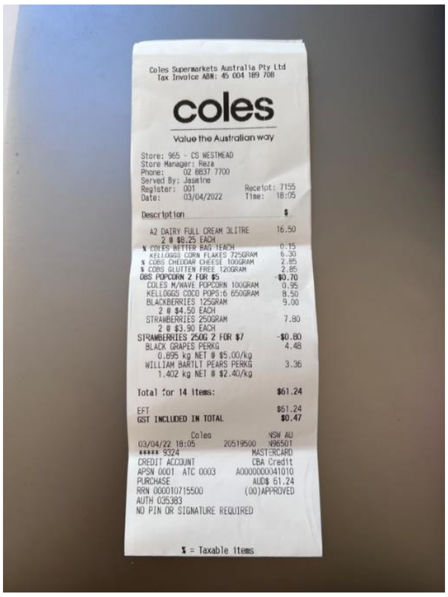
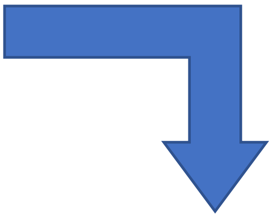
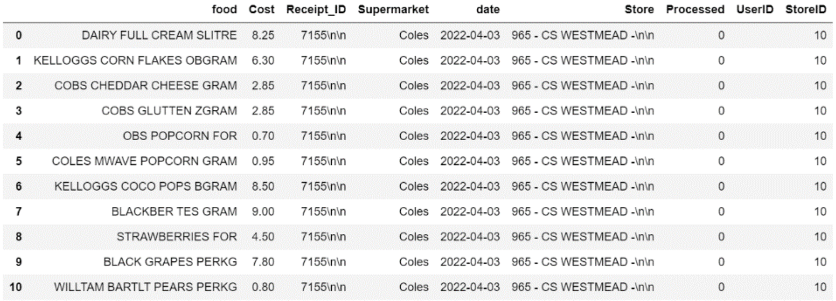
Documentation

Objective of the OCR code



```
Coles Supermarkets Australia Pty Ltd
  Tax Invoice ABN: 45 004 189 708

             coles
    Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:  001            Receipt: 7155
Date:      03/04/2022     Time:   18:05

Description                          $

  A2 DAIRY FULL CREAM 3LITRE      16.50
    2 @ $8.25 EACH
% COLES BETTER BAG 1EACH           0.15
  KELLOGGS CORN FLAKES 725GRAM     6.30
% COBS CHEDDAR CHEESE 100GRAM      2.85
% COBS GLUTTEN FREE 120GRAM        2.85
OBS POPCORN 2 FOR $5             -$0.70
 COLES M/WAVE POPCORN 100GRAM      0.95
 KELLOGGS COCO POPS:6 650GRAM      8.50
 BLACKBERRIES 125GRAM              9.00
    2 @ $4.50 EACH
 STRAWBERRIES 250GRAM              7.80
    2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7       -$0.80
 BLACK GRAPES PERKG                4.48
    0.895 kg NET @ $5.00/kg
 WILLIAM BARTLT PEARS PERKG        3.36
    1.402 kg NET @ $2.40/kg

Total for 14 items:              $61.24

EFT                              $61.24
GST INCLUDED IN TOTAL             $0.47

             Coles              NSW AU
03/04/22 18:05      20519500    N96501
***** 9324                  MASTERCARD
CREDIT ACCOUNT              CBA Credit
APSN 0001  ATC 0003    A0000000041010
PURCHASE                   AUD$ 61.24
RRN 000010715500        (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED


          % = Taxable items
```





	food	Cost	Receipt_ID	Supermarket	date	Store	Processed	UserID	StoreID
0	DAIRY FULL CREAM SLITRE	8.25	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
1	KELLOGGS CORN FLAKES OBGRAM	6.30	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
2	COBS CHEDDAR CHEESE GRAM	2.85	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
3	COBS GLUTTEN ZGRAM	2.85	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
4	OBS POPCORN FOR	0.70	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
5	COLES MWAVE POPCORN GRAM	0.95	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
6	KELLOGGS COCO POPS BGRAM	8.50	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
7	BLACKBER TES GRAM	9.00	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
8	STRAWBERRIES FOR	4.50	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
9	BLACK GRAPES PERKG	7.80	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
10	WILLTAM BARTLT PEARS PERKG	0.80	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10

The objective of the system is by means of computer vision techniques, automatically extract the text from a receipt, the text of interest is a list of groceries with their price, quantity, etc… and have it digitally so it can be displayed in a nicely formatted table or store it in a database eventually (SQL for example). The system will use traditional computer vision techniques such as canny edge, thresholding, perspective transforms, high pass filtering to essentially make the task easy for the OCR system to properly extract the text.

The whole system can be broken into these steps:

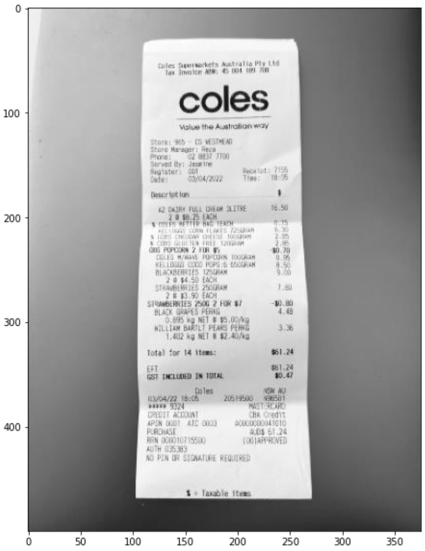
- Loading of the image in grayscale to start processing it
- An initial contour detection to crop the receipt only and leave out the background
- An adaptive thresholding – this will sharpen the text so that the OCR system has an easier time reading small letter
- Apply the OCR, this uses an external library (tesseract OCR by Google) to get all the text in the image

- Do processing on the text to remove any non-relevant informations such as the store address or the date, only leaving the grocery list
- Display the result in a table to check if it was correctly read
- Open an SQL database and save it there

All the steps are explained without using technical terms so that the overall idea can be understood.

Loading the image

The image which is initially a .jpg is loaded in grayscale. Color is not relevant in this case as the text is black/white. This will also make the processing easier.


0
100
200
300
400
0
50
100
150
200
250
300
350

```
Coles Supermarkets Australia Pty Ltd
Tax Invoice ABN: 45 004 189 708

coles
Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:  001             Receipt: 7155
Date:      03/04/2022      Time:   18:05

Description                            $

  A2 DAIRY FULL CREAM 3LITRE       16.50
    2 @ $8.25 EACH
% COLES BETTER BAG 1EACH            0.15
  KELLOGGS CORN FLAKES 725GRAM      6.30
% COBS CHEDDAR CHEESE 100GRAM       2.85
% COBS GLUTTEN FREE 120GRAM         2.85
CBS POPCORN 2 FOR $5              -$0.70
  COLES M/WAVE POPCORN 100GRAM      0.95
  KELLOGGS COCO POPS:6 650GRAM      8.50
  BLACKBERRIES 125GRAM              9.00
    2 @ $4.50 EACH
  STRAWBERRIES 250GRAM              7.80
    2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7        -$0.80
  BLACK GRAPES PERKG                4.48
    0.895 kg NET @ $5.00/kg
  WILLIAM BARTLT PEARS PERKG        3.36
    1.402 kg NET @ $2.40/kg

Total for 14 items:               $61.24

EFT                               $61.24
GST INCLUDED IN TOTAL              $0.47

           Coles                  NSW AU
03/04/22 18:05       20519500   N96501
***** 9324                    MASTERCARD
CREDIT ACCOUNT                CBA Credit
APSN 0001  ATC 0003     A0000000041010
PURCHASE                     AUD$ 61.24
RRN 000010715500          (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED

        % = Taxable items
```

The next part will be to remove any excess background. In this case, the gray table is not relevant for the text extraction, so it is removed.

Crop the receipt outer contour

For a human, it's easy to see the receipt contour but the machine always needs to be told what exactly needs to be done. For this purpose, the canny edge detector comes in handy. It is generated technique which find edges of objects. The issue is that, it cannot be applied directly. As it can be seen, there are actually a lot of edges because of the text, which will generate a lot of noise. So the text has to be erased somehow. But first it's always good to apply a small gaussian blur to remove any noise. This will make the processing afterwards easier and less error prone.

Now, the text should be erased. Because the image is in grayscale every pixel has a value between 0 and 255. 0 being black and 255 being white. The black pixels in the receipt which is text should be erased and the white pixel replace them somehow. If all the black pixels are simply replaced, the background will be also white, which is not wanted. So small regions of black should be erased.

This is simply handled by morphological operations. The principle is very simple. A structuring element must be defined. This is usually a square number of pixels. For example, 3x3:

1	1	1
1	1	1
1	1	1

This 3x3 matrix is usually filled with 1 to tell that it is active. Then, this structuring element will be overlayed on each pixel of the image taking the maximum in the neighbourhood of 3x3. As a simple example, say the input image is:

10	0	0	0	0
0	3	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

The structuring element is first laid on the top left pixel which has a value of 10. It is partially laid outside the image. The outside elements are taken to be 0. So in this case, the maximum in the neighbours is itself, 10. So it will put 10 on every element covered by the structuring element.

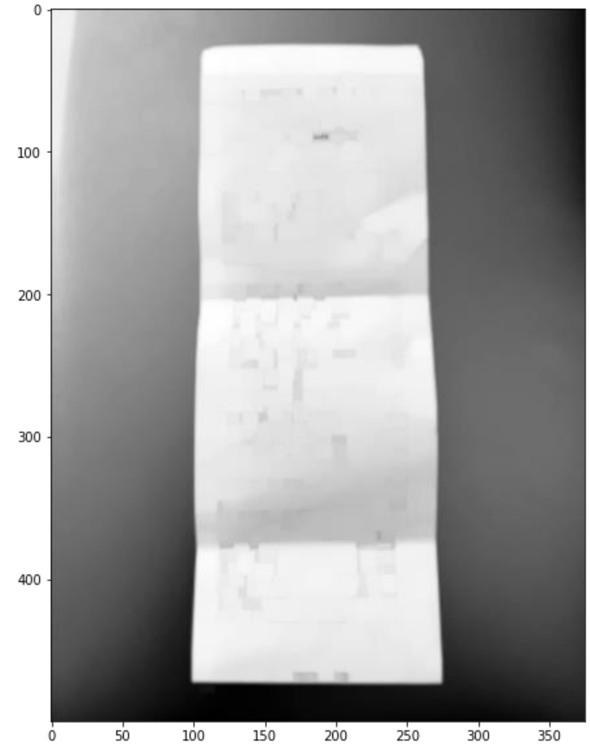
10	10	0	0	0
10	10	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0

The same process is repeated for every pixel, and the results is:

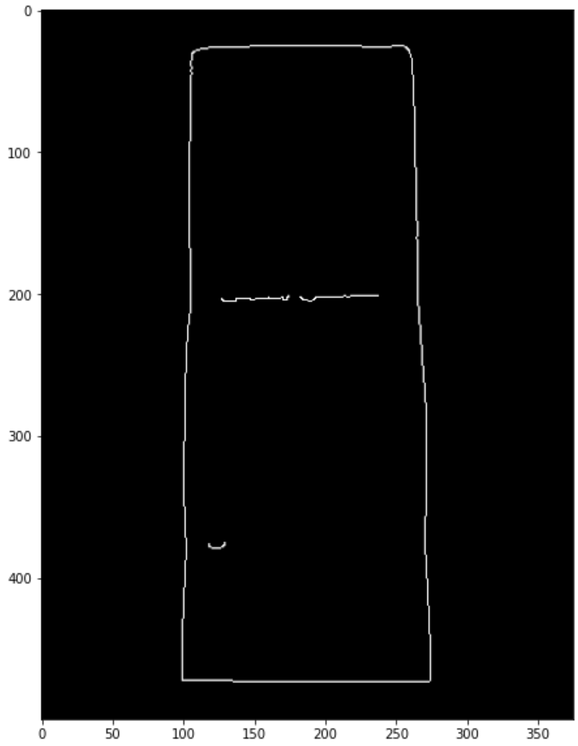
10	10	0	0	0
10	10	3	0	0
0	3	3	0	0
0	0	0	0	0
0	0	0	0	0

Note that the intermediary results is not taken for the next pixel but the initial image is taken each time. Otherwise the image would be filled with the maximum value.

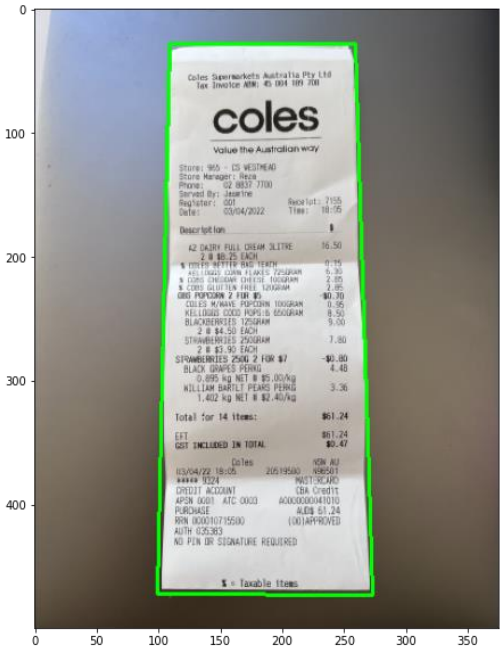
This has to purpose to fill the low value pixels but if a large amount of pixels is black, it stays black. Such as the background. The result on the receipt image is shown below:



In this case, a rectangular structuring element of 9x9 is used. The text has completely vanished to leave a white receipt paper. The canny edge detector can now be used to detect the outline without any difficulty.



The canny edge detector will give a binary image, this means it’s only filled either with white or black. The contour of the receipt is now clearly visible. It is now just a matter of following the line to find the contour. This is done by contour detection. It is possible to find the most outer contour and select it, another way is to select the contour with the biggest area and select it as the receipt contour. This must be done because small noise contour could still be picked and should not be used.

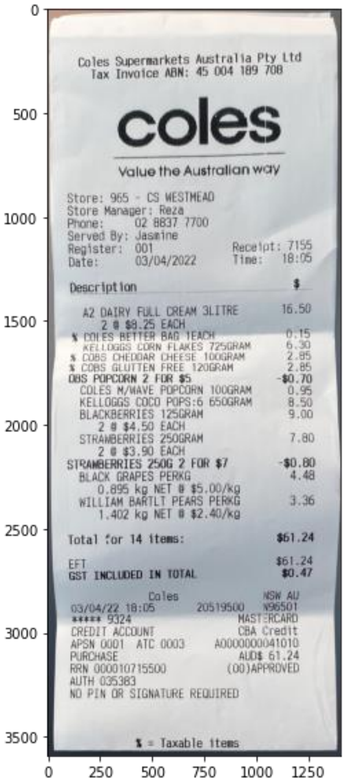


```
Coles Supermarkets Australia Pty Ltd
 Tax Invoice ABN: 45 004 189 708

          coles
 Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:   001            Receipt: 7155
Date:       03/04/2022     Time:    18:05

Description                            $

  A2 DAIRY FULL CREAM 3LITRE       16.50
     2 @ $8.25 EACH
$ COLES BETTER BAG 1EACH            0.15
  KELLOGGS CORN FLAKES 725GRAM      6.30
$ COBS CHEDDAR CHEESE 100GRAM       2.85
$ COBS GLUTTEN FREE 120GRAM         2.85
COBS POPCORN 2 FOR $5             -$0.70
  COLES M/WAVE POPCORN 100GRAM      0.95
  KELLOGGS COCO POPS:6 650GRAM      8.50
  BLACKBERRIES 125GRAM              9.00
     2 @ $4.50 EACH
  STRAWBERRIES 250GRAM              7.80
     2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7        -$0.80
  BLACK GRAPES PERKG                4.48
     0.895 kg NET @ $5.00/kg
  WILLIAM BARTLT PEARS PERKG        3.36
     1.402 kg NET @ $2.40/kg

Total for 14 items:               $61.24

EFT                               $61.24
GST INCLUDED IN TOTAL              $0.47

            Coles               NSW AU
03/04/22 18:05      20519500   N96501
***** 9324                 MASTERCARD
CREDIT ACCOUNT             CBA Credit
APSN 0001  ATC 0003    A0000000041010
PURCHASE                  AUD$ 61.24
RRN 000010715500        (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED

          $ = Taxable Items
```

The contour is a list of (x,y) points in the image. The contour of the receipt should be rectangular so in the ideal case, it should only be 4 points. But because of the creases and the perspective, it is not perfectly rectangular and will give more points. It is still possible approximate the contour with less points. There exist simple algorithms which will only keep the most important points and leave the points which are not characteristic. After the approximation is done, 4 points should be left.

The process has already come a long way. But this is mostly done for the computer vision preprocessing part. The OCR will take care of the rest.

Once the 4 points have been found. It is used to crop the receipt from the image. Because the 4 points, are not necessarily perfectly aligned with 90 degrees, the image has to be rotated, scaled and stretched in certain directions to get a rectangular image.



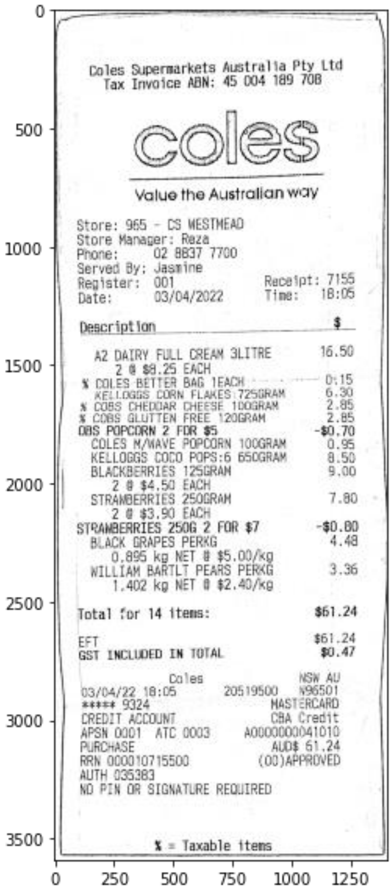
```
   Coles Supermarkets Australia Pty Ltd
     Tax Invoice ABN: 45 004 189 708

                 coles
        Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:   001               Receipt: 7155
Date:       03/04/2022        Time:    18:05

Description                              $

  A2 DAIRY FULL CREAM 3LITRE         16.50
     2 @ $8.25 EACH
% COLES BETTER BAG 1EACH              0.15
  KELLOGGS CORN FLAKES 725GRAM        6.30
% COBS CHEDDAR CHEESE 100GRAM         2.85
% COBS GLUTTEN FREE 120GRAM           2.85
OBS POPCORN 2 FOR $5                -$0.70
  COLES M/WAVE POPCORN 100GRAM        0.95
  KELLOGGS COCO POPS:6 650GRAM        8.50
  BLACKBERRIES 125GRAM                9.00
     2 @ $4.50 EACH
  STRAWBERRIES 250GRAM                7.80
     2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7          -$0.80
  BLACK GRAPES PERKG                  4.48
     0.895 kg NET @ $5.00/kg
  WILLIAM BARTLT PEARS PERKG          3.36
     1.402 kg NET @ $2.40/kg

Total for 14 items:                 $61.24

EFT                                 $61.24
GST INCLUDED IN TOTAL                $0.47

              Coles                NSW AU
03/04/22 18:05          20519500   W96501
***** 9324                     MASTERCARD
CREDIT ACCOUNT                 CBA Credit
APSN 0001  ATC 0003      A0000000041010
PURCHASE                     AUD$ 61.24
RRN 000010715500           (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED

           % = Taxable items
```

The previous steps were actually done on a smaller scale image. It was not important to see the small details. Now that the OCR must be done, it is important to take the high-resolution image again.

OCR

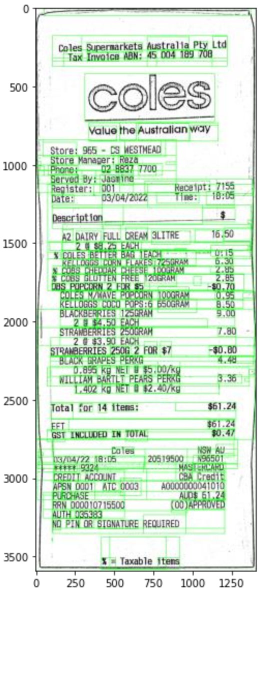
To extract the text, the library pytesseract is used. This is the python binding for the C++ open-source library TesseractOCR. It is the most robust, freely available open-source engine. It uses sophisticated techniques such as neural networks to give the best results.

Before giving the image to tesseract, a last processing step is done. The image is sharpened in order to read the small text. The focus on the image could have been bad, and it is hard for tesseract to read fuzzy text. The sharpening is done with a process like the canny edge detection.



```
  Coles Supermarkets Australia Pty Ltd
     Tax Invoice ABN: 45 004 189 708

                 coles
        Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:  001              Receipt: 7155
Date:      03/04/2022       Time:    18:05

Description                            $

  A2 DAIRY FULL CREAM 3LITRE        16.50
     2 @ $8.25 EACH
% COLES BETTER BAG 1EACH             0:15
  KELLOGGS CORN FLAKES 725GRAM       6.30
% COBS CHEDDAR CHEESE 100GRAM        2.85
% COBS GLUTTEN FREE 120GRAM          2.85
OBS POPCORN 2 FOR $5                -$0.70
  COLES M/WAVE POPCORN 100GRAM       0.95
  KELLOGGS COCO POPS:6 650GRAM       8.50
  BLACKBERRIES 125GRAM               9.00
     2 @ $4.50 EACH
  STRAWBERRIES 250GRAM               7.80
     2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7          -$0.80
  BLACK GRAPES PERKG                 4.48
     0.895 kg NET @ $5.00/kg
  WILLIAM BARTLT PEARS PERKG         3.36
     1.402 kg NET @ $2.40/kg

Total for 14 items:                $61.24

EFT                                $61.24
GST INCLUDED IN TOTAL               $0.47

             Coles                NSW AU
03/04/22 18:05        20519500    N96501
***** 9324                    MASTERCARD
CREDIT ACCOUNT                CBA Credit
APSN 0001  ATC 0003      A0000000041010
PURCHASE                     AUD$ 61.24
RRN 000010715500           (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED

           % = Taxable items
```

The text is read by tesseract and every block of text is aggregated together. Tesseract will automatically see that certain parts are lines, etc..



```
  Coles Supermarkets Australia Pty Ltd
     Tax Invoice ABN: 45 004 189 708

                 coles
        Value the Australian way

Store: 965 - CS WESTMEAD
Store Manager: Reza
Phone:      02 8837 7700
Served By: Jasmine
Register:  001              Receipt: 7155
Date:      03/04/2022       Time:    18:05

Description                            $

  A2 DAIRY FULL CREAM 3LITRE        16.50
     2 @ $8.25 EACH
% COLES BETTER BAG 1EACH             0:15
  KELLOGGS CORN FLAKES 725GRAM       6.30
% COBS CHEDDAR CHEESE 100GRAM        2.85
% COBS GLUTTEN FREE 120GRAM          2.85
OBS POPCORN 2 FOR $5                -$0.70
  COLES M/WAVE POPCORN 100GRAM       0.95
  KELLOGGS COCO POPS:6 650GRAM       8.50
  BLACKBERRIES 125GRAM               9.00
     2 @ $4.50 EACH
  STRAWBERRIES 250GRAM               7.80
     2 @ $3.90 EACH
STRAWBERRIES 250G 2 FOR $7          -$0.80
  BLACK GRAPES PERKG                 4.48
     0.895 kg NET @ $5.00/kg
  WILLIAM BARTLT PEARS PERKG         3.36
     1.402 kg NET @ $2.40/kg

Total for 14 items:                $61.24

EFT                                $61.24
GST INCLUDED IN TOTAL               $0.47

             Coles                NSW AU
03/04/22 18:05        20519500    N96501
***** 9324                    MASTERCARD
CREDIT ACCOUNT                CBA Credit
APSN 0001  ATC 0003      A0000000041010
PURCHASE                     AUD$ 61.24
RRN 000010715500           (00)APPROVED
AUTH 035383
NO PIN OR SIGNATURE REQUIRED

           % = Taxable items
```

The complete extracted is shown below:

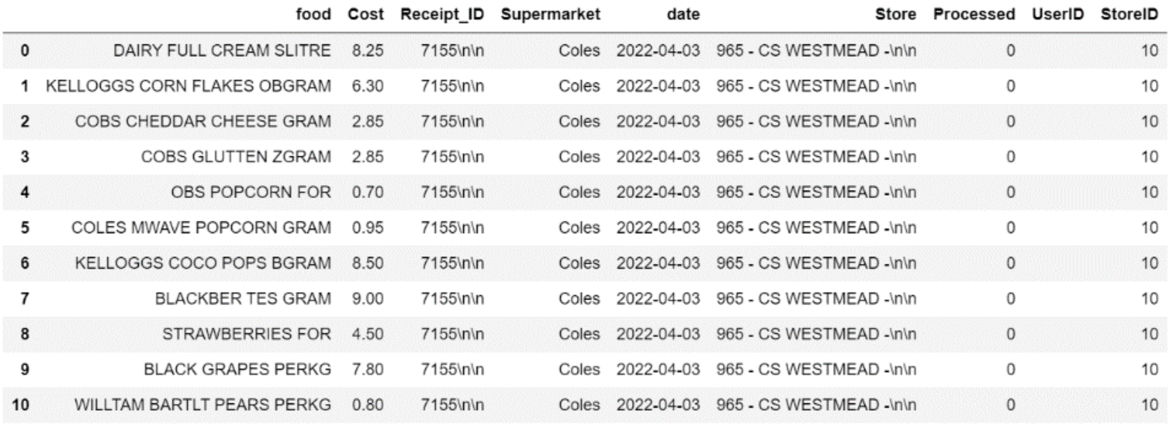
```
RCH
~ RRN 000010718800



“Coles Supermarkets Australia Pty
Ltd
Tax Invoice ABN: 45 004 189 708



Value the Australian way

Store: 965 - CS WESTMEAD -

; Store Manager: Reza | a
}' Phone: 02 8837 7700
Served By: Hagin tne

Register: Receipt: 7155

Date: - 03/04/2022 Times 18:05
bescription _ eer 2 ;
A2 DAIRY. FULL CREAM SLITRE 16. 50
| 8,25 EACH a -
oe coves. BETTER BAG JEACH=0 ~~ O1
5
KELLOGGS CORN FLAKES: ST OBGRAM 6.
30
% COBS CHEDDAR CHEESE 100GRAM 2.85
|
% COBS GLUTTEN hs 1Z0GRAM a 2.85 |
OBS POPCORN 2 FOR $5 ~$0.70

COLES M/WAVE POPCORN 100GRAM 0.95
|

KELLOGGS COCO POPS:6 B50GRAM 8.50

BLACKBER TES 125GRAM 9.00
2 @ $4.50 EACH |
| aa 250GRAM 7.80
STRAWBERRIES. 2506 2 FOR $7 | -$0.
80
BLACK GRAPES PERKG 4.48.
: 0,895 kg NET @ $5. 00/kg 7m
+ WILLTAM BARTLT PEARS PERKG ~ 3.3
6 |
1.402 kg NET @ $2.40/kg :
Total For 14 items: — $61.24
EFT $61.24
GST INCLUDED IN TOTAL $0.47

| | Coles NSW AU
| 03/04/22 18:05 20519500, /NOB5O1
-.

fe RR OBZ WS TERCARD
CREDIT ACCOUNT A Credit
pr eh OE ATC. 0003 soot

UD$ 61.24
(00) APPROVED
AUTH 035383
NO PIN “OR SIGNATURE REQUIRED

!

= heshig items
```

The text has to be cleaned up. Any informations which is not relevant is removed, this is usually very hard to do because it requires an understanding of written text but in the case of receipt, the text has usually the same format, and using pattern matching, it's possible to see which part represent the grocery list.

The following informations are extracted:

- The supermarket name (Cole, Woolworth, …)
- The date
- The store (for ex. 965 – cs westhead)
- The receipt ID
- The list of products and prices
- The amounts

The final list is shown below:

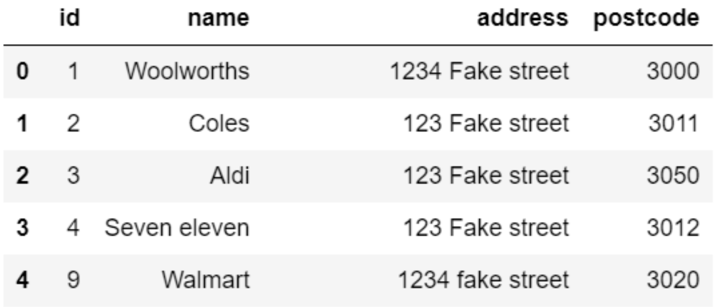


	food	Cost	Receipt_ID	Supermarket	date	Store	Processed	UserID	StoreID
0	DAIRY FULL CREAM SLITRE	8.25	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
1	KELLOGGS CORN FLAKES OBGRAM	6.30	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
2	COBS CHEDDAR CHEESE GRAM	2.85	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
3	COBS GLUTTEN ZGRAM	2.85	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
4	OBS POPCORN FOR	0.70	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
5	COLES MWAVE POPCORN GRAM	0.95	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
6	KELLOGGS COCO POPS BGRAM	8.50	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
7	BLACKBER TES GRAM	9.00	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
8	STRAWBERRIES FOR	4.50	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
9	BLACK GRAPES PERKG	7.80	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10
10	WILLTAM BARTLT PEARS PERKG	0.80	7155\n\n	Coles	2022-04-03	965 - CS WESTMEAD -\n\n	0		10

Storing in an SQL database

The list is now digitally available and can be stored in any database. This is useful to automatically save and do statistics on the database with queries. For example, a list of shops can be queried with:

SELECT * FROM shops



	id	name	address	postcode
0	1	Woolworths	1234 Fake street	3000
1	2	Coles	123 Fake street	3011
2	3	Aldi	123 Fake street	3050
3	4	Seven eleven	123 Fake street	3012
4	9	Walmart	1234 fake street	3020

Accuracy of the code.

Receipt ID	store	Text extraction accuracy
eReceipt_3349_Dandenong_04Mar2022__ztpfx	woolworths	95%
eReceipt_3395_Pakenham Market Place_07May2022__gnjwy	woolworths	95%
eReceipt_3806_Clayton_06May2022__xgtgz	woolworths	95%
eReceipt_3807_Dandenong South_03May2022__mrkhe	woolworths	95%
eReceipt_3807_Dandenong South_05May2022__ayqyv	woolworths	98%
eReceipt_3807_Dandenong South_06Apr2022__xpwvw	woolworths	95%
eReceipt_3807_Dandenong South_07May2022__zgpoa	woolworths	95%
eReceipt_3807_Dandenong South_09Apr2022__aofvy	woolworths	98%
eReceipt_3807_Dandenong South_18Apr2022__dwlpn	woolworths	95%
eReceipt_3807_Dandenong South_22Apr2022__mbvjd	woolworths	98%
eReceipt_3807_Dandenong South_22Mar2022__bcecw	woolworths	95%
eReceipt_3807_Dandenong South_22Mar2022__bcecw	woolworths	98%
eReceipt_3807_Dandenong South_23Apr2022__kbxcw	woolworths	90%
eReceipt_3807_Dandenong South_23Apr2022__wkkxy	woolworths	95%
eReceipt_3807_Dandenong South_26Apr2022__btmpe	woolworths	95%
eReceipt_3807_Dandenong South_28Apr2022__phzid	woolworths	98%
eReceipt_3807_Dandenong South_28Apr2022__qmyau	woolworths	98%
eReceipt_3807_Dandenong South_30Apr2022__gxdkn	woolworths	98%
eReceipt_3807_Dandenong South_31Mar2022__cbaqb	woolworths	98%

The eReceipts are working perfectly with the code and has good accuracies of text extraction. The only remark is character “@” is taking as “0”.

Completed Deliverables

Computer Vision and Data Engineering Team

The following is the tasks/deliverables that had been completed by the Computer Vision and Data Engineering team in this trimester.

Task	Completed by
Research and upskilling for existing technology stack for OCR.	Sandesh, Mahalaxmi, Preet, Victor, Chiru
Apply OCR on some test data and extracted the output into Excel format.	Sandesh, Mahalaxmi, Preet,
Analysing the receipt layout, fields and the differences for Woolworths and Coles	Victor, Chiru
Construct a table contain all the required attributes for the extracted data from the receipt.	Victor, Chiru
Defines rules for extracting required data out of the receipts and stored in a pandas data frame.	Sandesh, Mahalaxmi, Victor
Test the OCR code using different set of receipt image in local machine	Preet, Chiru
Test the accuracy of the OCR code (Check the extracted text and compare with the actual	Sandesh, Victor

receipt) and record the accuracy of each receipt in Excel file.	