Hacksembly

December 17, 2021

1 Hacksembly

1.1 Project - Extracting nutrition data from nutrition label images

Tesseract, an open source library for optical character recognition

Self notes for installation There is a docker image for tesseract `docker pull ocrd/tesserocr`

However I'm going to install pytesseract on top of tensorflow-notebook as base.
`docker run -p 8888:8888 -v "${PWD}":/home/jovyan/work -e GRANT_SUDO=yes jupyter/tensorflow-notebook:tensorflow-2.4.1 docker exec -it [container] /bin/sh sudo apt update sudo apt install tesseract-ocr sudo apt install libtesseract-dev sudo pip install pytesseract`

1.1.1 lib documentation

- https://pypi.org/project/pytesseract/
- pytesseract is a wrapper for tesseract OCR engine
- https://github.com/tesseract-ocr/tesseract
- https://github.com/tesseract-ocr/tessdoc

```
[33]: #imports

from PIL import Image
import pytesseract
import requests # for reading images from urls
```

1.1.2 Preprocessing -

- Binary Classification :TODO
  - Ideally, we would need a binary classifer first to identify those images with nutrition label.
  - Only those that filtered through the classifer would proceed for image to text processing
- up/down scale image size for better performance :TODO
- greyscale conversion done below needs to be part of preprocessing

```
[53]: stdvertimg = Image.open("work/stdvert.jpg")
print("image dimensions {}*{}".format(stdvertimg.width,stdvertimg.height))
```

```
display(stdvertimg) #use Ipython's display instead of image.show()
```

image dimensions 344*626

Nutrition Facts

8 servings per container
Serving size **2/3 cup (55g)**

Amount per serving
Calories 230

% Daily Value*

Total Fat 8g	**10%**
Saturated Fat 1g	**5%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 160mg	**7%**
Total Carbohydrate 37g	**13%**
Dietary Fiber 4g	**14%**
Total Sugars 12g	
Includes 10g Added Sugars	**20%**
Protein 3g	
Vitamin D 2mcg	10%
Calcium 260mg	20%
Iron 8mg	45%
Potassium 240mg	6%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

```
[12]: text = pytesseract.image_to_string(stdvertimg) # extract text from image
      print(text)
```

Nutrition Facts

8 servings per container
Serving size 2/3 cup (55g)
-

Calories _230

% Daily Value*

Total Fat 89 10%
Saturated Fat 1g 5%
Trans Fat 0g

Chol 1 omg 0%

Sodium 160mg 7%

Total Carbohydra' 13%
Dietary Fiber 4g 14%

Total Sugars 129
Includes 10g Added Sugars 20%
Protein 3g

Vitamin D 2meg 10%
Calcium 260mg 20%
Iron 8mg 45%
Potassium 240mg 6%

"The % Daily Value (DV) tells you how much a nutrient in
a serving of food contributes to a daily diet. 2,000 calories
a day is used for general nutrition advice.

1.1.3 converting to greyscale image

```
[13]: print(pytesseract.image_to_string(stdvertimg.convert('L')))
```

Nutrition Facts

8 servings per container
Serving size 2/3 cup (55g)
--

Calories 230

% Daily Value*

Total Fat 89 10%
Saturated Fat 1g 5%
Trans Fat 0g

Chol 1 omg 0%

Sodium 160mg 7%

Total Carbohydrat 13%
Dietary Fiber 49 14%

Total Sugars 129
Includes 10g Added Sugars 20%
Protein 3g

Vitamin D 2meg 10%
Calcium 260mg 20%
Iron 8mg 45%

Potassium 240mg 6%

"The % Daily Value (DV) tells you how much a nutrient in
a serving of food contributes to a daily diet. 2,000 calories
a day is used for general nutrition advice.

```
text = pytesseract.image_to_data(stdvertimg)
print(type(text))
print(text)
```

```
<class 'str'>
level   page_num        block_num       par_num line_num        word_num
left    top     width   height  conf    text
1       1       0       0       0       0       0       0       344     626
-1
2       1       1       0       0       0       8       7       329     3
-1
3       1       1       1       0       0       8       7       329     3
-1
4       1       1       1       1       0       8       7       329     3
-1
5       1       1       1       1       1       8       7       329     3
95
2       1       2       0       0       0       7       8       3       612
-1
3       1       2       1       0       0       7       8       3       612
-1
4       1       2       1       1       0       7       8       3       612
-1
5       1       2       1       1       1       7       8       3       612
95
2       1       3       0       0       0       14      16      316     31
-1
3       1       3       1       0       0       14      16      316     31
-1
4       1       3       1       1       0       14      16      316     31
-1
5       1       3       1       1       1       14      16      184     31
96      Nutrition
5       1       3       1       1       2       216     17      114     30
95      Facts
2       1       4       0       0       0       15      61      315     60
-1
```

3	1	4	1	0	0	15	61	315	60	-1	
4	1	4	1	1	0	16	61	213	19	-1	
5	1	4	1	1	1	16	62	10	14	96	8
5	1	4	1	1	2	33	61	73	19	96	servings
5	1	4	1	1	3	113	65	28	15	96	per
5	1	4	1	1	4	147	61	82	16	96	container
4	1	4	1	2	0	15	83	315	19	-1	
5	1	4	1	2	1	15	83	81	19	96	Serving
5	1	4	1	2	2	104	83	42	15	96	size
5	1	4	1	2	3	190	83	31	17	94	2/3
5	1	4	1	2	4	229	87	39	15	95	cup
5	1	4	1	2	5	276	83	54	19	92	(55g)
4	1	4	1	3	0	16	107	313	14	-1	
5	1	4	1	3	1	0	103	71	27	47	-
2	1	5	0	0	0	15	132	314	41	-1	
3	1	5	1	0	0	15	132	314	41	-1	
4	1	5	1	1	0	15	132	314	41	-1	
5	1	5	1	1	1	15	132	144	41	8	Calories
5	1	5	1	1	2	244	140	85	33	53	_230
2	1	6	0	0	0	232	195	96	11	-1	
3	1	6	1	0	0	232	195	96	11	-1	
4	1	6	1	1	0	232	195	96	11	-1	
5	1	6	1	1	1	232	195	12	9	54	%
5	1	6	1	1	2	249	195	32	11	93	Daily

5	1	6	1	1	3	285	195	43	9	86	Value*
2	1	7	0	0	0	16	181	313	6	-1	
3	1	7	1	0	0	16	181	313	6	-1	
4	1	7	1	1	0	16	181	313	6	-1	
5	1	7	1	1	1	16	181	313	6	95	
2	1	8	0	0	0	51	290	60	12	-1	
3	1	8	1	0	0	51	290	60	12	-1	
4	1	8	1	1	0	51	290	60	12	-1	
5	1	8	1	1	1	51	290	60	12	95	
2	1	9	0	0	0	168	339	49	15	-1	
3	1	9	1	0	0	168	339	49	15	-1	
4	1	9	1	1	0	168	339	49	15	-1	
5	1	9	1	1	1	168	339	49	15	95	
2	1	10	0	0	0	5	218	324	160	-1	
3	1	10	1	0	0	17	218	312	64	-1	
4	1	10	1	1	0	17	218	312	16	-1	
5	1	10	1	1	1	17	218	44	12	96	Total
5	1	10	1	1	2	68	218	27	12	96	Fat
5	1	10	1	1	3	101	219	17	15	86	89
5	1	10	1	1	4	292	218	37	13	96	10%
4	1	10	1	2	0	37	242	292	16	-1	
5	1	10	1	2	1	37	242	68	12	91	Saturated
5	1	10	1	2	2	112	242	22	12	96	Fat
5	1	10	1	2	3	139	243	16	15	86	1g

5	1	10	1	2	4	302	242	27	13
92	5%								
4	1	10	1	3	0	39	266	88	16
-1									
5	1	10	1	3	1	39	266	39	12
94	Trans								
5	1	10	1	3	2	83	266	22	12
95	Fat								
5	1	10	1	3	3	110	267	17	15
86	0g								
3	1	10	2	0	0	5	280	324	32
-1									
4	1	10	2	1	0	5	280	324	32
-1									
5	1	10	2	1	1	5	280	45	32
87	Chol								
5	1	10	2	1	2	112	290	4	12
31	1								
5	1	10	2	1	3	123	291	30	15
31	omg								
5	1	10	2	1	4	302	290	27	13
96	0%								
3	1	10	3	0	0	17	314	312	16
-1									
4	1	10	3	1	0	17	314	312	16
-1									
5	1	10	3	1	1	17	314	64	12
95	Sodium								
5	1	10	3	1	2	88	315	47	15
95	160mg								
5	1	10	3	1	3	302	314	27	13
66	7%								
3	1	10	4	0	0	17	338	312	40
-1									
4	1	10	4	1	0	17	338	312	15
-1									
5	1	10	4	1	1	17	338	44	12
93	Total								
5	1	10	4	1	2	68	338	99	15
17	Carbohydra'								
5	1	10	4	1	3	292	338	37	13
95	13%								
4	1	10	4	2	0	38	362	291	16
-1									
5	1	10	4	2	1	38	362	49	15
96	Dietary								
5	1	10	4	2	2	93	362	35	12
96	Fiber								

5 79	1 4g	10	4	2	3	133	362	17	16
5 96	1 14%	10	4	2	4	292	362	37	13
2 -1	1	11	0	0	0	17	386	312	64
3 -1	1	11	1	0	0	17	386	312	64
4 -1	1	11	1	1	0	37	386	121	16
5 96	1 Total	11	1	1	1	37	386	34	12
5 96	1 Sugars	11	1	1	2	77	386	50	16
5 82	1 129	11	1	1	3	133	386	25	16
4 -1	1	11	1	2	0	58	410	271	16
5 94	1 Includes	11	1	2	1	58	410	58	12
5 94	1 10g	11	1	2	2	122	411	24	15
5 94	1 Added	11	1	2	3	152	410	45	12
5 67	1 Sugars	11	1	2	4	203	410	50	16
5 49	1 20%	11	1	2	5	291	410	38	13
4 -1	1	11	1	3	0	17	434	85	16
5 96	1 Protein	11	1	3	1	17	434	62	12
5 69	1 3g	11	1	3	2	85	435	17	15
2 -1	1	12	0	0	0	17	472	312	88
3 -1	1	12	1	0	0	17	472	312	88
4 -1	1	12	1	1	0	17	472	312	16
5 93	1 Vitamin	12	1	1	1	17	472	52	12
5 89	1 D	12	1	1	2	75	472	10	12
5 89	1 2meg	12	1	1	3	91	473	38	15
5 95	1 10%	12	1	1	4	297	473	32	11

4	1	12	1	2	0	17	496	312	16
-1									
5	1	12	1	2	1	17	496	56	12
95	Calcium								
5	1	12	1	2	2	79	497	48	15
94	260mg								
5	1	12	1	2	3	296	497	33	11
91	20%								
4	1	12	1	3	0	18	520	311	16
-1									
5	1	12	1	3	1	18	520	25	12
47	Iron								
5	1	12	1	3	2	49	521	30	15
87	8mg								
5	1	12	1	3	3	296	521	33	11
95	45%								
4	1	12	1	4	0	17	544	312	16
-1									
5	1	12	1	4	1	17	544	74	12
96	Potassium								
5	1	12	1	4	2	96	544	48	16
95	240mg								
5	1	12	1	4	3	306	545	23	11
91	6%								
2	1	13	0	0	0	15	574	311	40
-1									
3	1	13	1	0	0	15	574	311	40
-1									
4	1	13	1	1	0	15	574	305	12
-1									
5	1	13	1	1	1	15	574	28	9
50	"The								
5	1	13	1	1	2	47	575	10	8
92	%								
5	1	13	1	1	3	61	574	26	12
71	Daily								
5	1	13	1	1	4	91	574	30	9
95	Value								
5	1	13	1	1	5	125	574	24	11
95	(DV)								
5	1	13	1	1	6	153	574	21	9
95	tells								
5	1	13	1	1	7	178	576	18	10
92	you								
5	1	13	1	1	8	201	574	21	9
92	how								
5	1	13	1	1	9	226	574	28	9
95	much								

5	1	13	1	1	10	259	576	4	7	95	a
5	1	13	1	1	11	262	575	46	8	95	nutrient
5	1	13	1	1	12	312	576	8	7	67	in
4	1	13	1	2	0	23	588	303	12	-1	
5	1	13	1	2	1	23	590	6	7	69	a
5	1	13	1	2	2	33	590	37	10	93	serving
5	1	13	1	2	3	74	588	10	9	96	of
5	1	13	1	2	4	88	588	22	9	96	food
5	1	13	1	2	5	114	588	58	9	96	contributes
5	1	13	1	2	6	176	589	9	8	96	to
5	1	13	1	2	7	189	590	6	7	96	a
5	1	13	1	2	8	199	588	24	12	96	daily
5	1	13	1	2	9	227	588	19	9	95	diet.
5	1	13	1	2	10	253	588	29	11	93	2,000
5	1	13	1	2	11	286	588	40	9	94	calories
4	1	13	1	3	0	23	602	215	12	-1	
5	1	13	1	3	1	16	592	10	28	52	a
5	1	13	1	3	2	33	602	18	12	94	day
5	1	13	1	3	3	56	604	7	7	86	is
5	1	13	1	3	4	68	602	24	9	86	used
5	1	13	1	3	5	97	602	13	9	96	for
5	1	13	1	3	6	114	602	39	12	96	general
5	1	13	1	3	7	158	603	41	8	78	nutrition
5	1	13	1	3	8	204	602	34	9	96	advice.

2	1	14	0	0	0	8	618	329	3
-1									
3	1	14	1	0	0	8	618	329	3
-1									
4	1	14	1	1	0	8	618	329	3
-1									
5	1	14	1	1	1	8	618	329	3
95									
2	1	15	0	0	0	335	8	3	612
-1									
3	1	15	1	0	0	335	8	3	612
-1									
4	1	15	1	1	0	335	8	3	612
-1									
5	1	15	1	1	1	335	8	3	612
95									

```
[55]: print(pytesseract.image_to_string(stdvertimg, config="-c
      tessedit_char_whitelist=01234567890ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz*%,/
      ()\ ><"))
```

Nutrition Facts

8 servings per container
Serving size 2/3 cup (55g)
ee

Calories 230

% Daily Value*

Total Fat 89 10%
Saturated Fat 1g 5%
Trans Fat 0g

Chol 1 omg 0%

Sodium 160mg 7%

Total Carbohydrat 13%
Dietary Fiber 4g 14%

Total Sugars 129
Includes 10g Added Sugars 20%
Protein 3g

Vitamin D 2meg 10%
Calcium 260mg 20%
Iron 8mg 45%
Potassium 240mg 6%

* The % Daily Value (DV) tells you how much a nutrient in
a serving of food contributes to a daily diet, 2,000 calories
a day is used for general nutrition advice,

```
[44]: #url = "https://i5.walmartimages.com/asr/97bcdb4b-a0fd-498e-95fe-3773548c16ab.
       ↪b9bd1f6e34aacdd9efa41cf2cb1307f4.jpeg?
       ↪odnHeight=612&odnWidth=612&odnBg=FFFFFF"
      # https://www.foodcity.com/product/501/0007524320214
      url = "https://kvat-webassets.aisleahead.com/getMainImageSquare.php?
       ↪upc=0007524320214&size=800&order=6"
      img = Image.open(requests.get(url, stream=True).raw)
      display(img)
      print(pytesseract.image_to_string(img))
```

Nutrition Facts

9 servings per container

Serving size 2/3 cup (85g)

Amount per serving

Calories 130

% Daily Value*

Total Fat 2.5g	**3%**
Saturated Fat 1.5g	**8%**
Trans Fat 0g	
Cholesterol 10mg	**4%**
Sodium 60mg	**3%**
Total Carbohydrate 25g	**9%**
Dietary Fiber 0g	**0%**
Total Sugars 18g	
Includes 13g Added Sugars	**27%**
Protein 3g	

Vitamin D 0mcg 0%	Calcium 110mg 8%
Iron 0mg 0%	Potassium 150mg 4%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Saturated Fat 1.59

Trans Fat 0g
Cholesterol 10mg
Sodium 60mg
Total Carbohydrate 259

Dietary Fiber 0g

Total Sugars 18g

Includes 139 Added Sugars 27%

```
Protein 3g
Vitamin D Omg 0% + Calcium 110mg 8%
lronOmg 0% -» Potassium 150mg 4%

"The Daly Value (DV) tls you how much a nutrient
ina senig of food contbues toa daly ie. 2000
canis a days used for general nutrton advice,
```

[45]:
```python
img = img.convert('L') #greyscale – seems to give better results
display(img)
print(pytesseract.image_to_string(img))
```

Nutrition Facts

9 servings per container

Serving size 2/3 cup (85g)

Amount per serving

Calories 130

	% Daily Value*
Total Fat 2.5g	3%
Saturated Fat 1.5g	8%
Trans Fat 0g	
Cholesterol 10mg	4%
Sodium 60mg	3%
Total Carbohydrate 25g	9%
Dietary Fiber 0g	0%
Total Sugars 18g	
Includes 13g Added Sugars	27%
Protein 3g	

Vitamin D 0mcg 0%	Calcium 110mg 8%
Iron 0mg 0%	Potassium 150mg 4%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

```
Nutrition Facts
9 servings per container
Serving size 2/3 cup (859)
Amount per serving
Calories 130
% Daily Value*
Total Fat 2.59 3%
Saturated Fat 1.59 8%
Trans Fat 0g
Cholesterol 10mg 4%
Sodium 60mg 3%
Total Carbohydrate 25g 9%
Dietary Fiber Og 0%
Total Sugars 18g
Includes 139 Added Sugars 27%
Protein 3g
Vitamin D Omeg 0% » Calcium 110mg 8%
lon Omg 0% ©» Potassium 150mg 4%

"The Daly Value (DV) tls you how much a nutent
ina senig of food contbues toa daly ie. 2000
canis a days used for general nutrion advice,
```

[46]:
```python
img = img.convert('1') #binarization,  bad result compared to
display(img)
print(pytesseract.image_to_string(img))
```

Nutrition Facts

9 servings per container

Serving size 2/3 cup (85g)

Amount per serving

Calories 130

% Daily Value*

Total Fat 2.5g	**3%**
Saturated Fat 1.5g	**8%**
Trans Fat 0g	
Cholesterol 10mg	**4%**
Sodium 60mg	**3%**
Total Carbohydrate 25g	**9%**
Dietary Fiber 0g	**0%**
Total Sugars 18g	
Includes 13g Added Sugars	**27%**
Protein 3g	

Vitamin D 0mcg 0% • Calcium 110mg 8%

Iron 0mg 0% • Potassium 150mg 4%

*The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Nutrition Facts
9 servings per container
Serving size 2/3 cup (859)

Re RST EN |
'Amount per serving
Calories 130
ae bally value
Total Fat? 50 ah
Salurated Fat 15g
Trans Fat 0g

Cholesteral 10mg

```
Sodium 60m
Total Carbohydrate 259
Dietary Fiber Og
'Total Suoars (80
tneodes 18a Adced Sugars 27%
Protein 3o

Vitamin D Ortog 0% + Calcium 110mg 8%
Fevdng 0% + Potassium 150mg 4%

"The Day Valu (OV ols you how much a hint
Peipianee bry eM
esa tay ied fv gral nut ave.
```

```python
[47]: url = "https://i5.walmartimages.com/asr/97bcdb4b-a0fd-498e-95fe-3773548c16ab.
      ↪b9bd1f6e34aacdd9efa41cf2cb1307f4.jpeg?
      ↪odnHeight=612&odnWidth=612&odnBg=FFFFFF"
      img = Image.open(requests.get(url, stream=True).raw)
      display(img)
      print(pytesseract.image_to_string(img))
      img = img.convert('L')
      display(img)
      print(pytesseract.image_to_string(img))
```

Nutrition Facts

about 3.5 servings per container

Serving size 1/2 cup (130g)

Amount per serving

Calories 110

	% Daily Value*
Total Fat 2g	3%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 120mg	5%
Total Carbohydrate 18g	7%
Dietary Fiber 4g	14%
Total Sugars 3g	
Includes 0g Added Sugars	0%
Protein 6g	

Vit. D 0mcg 0%	●	Calcium 30mg 2%
Iron 1.2mg 6%	●	Potas. 210mg 4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Nutrition Facts

about 3.5 servings per container

/Amount per serving
Calories 110
Dally Value
Total Fat 29 3%
Saturated Fat 0g 0%:
Trans Fat 0g
Cholesterol 0mg 0%
'Sodium 120mg 5%
Total Carbohydrate 189 T%

Dietary Fiber 4g 14%

Total Sugars 39
Includes 0g Added Sugars 0%

[|
Vit. D 0mcg 0% - © Calcium 30mg 2%
iron 1.2m 6% Potas, 210mg 4%
oe

"The % Daily Vaue (DV) tes you how mucha nutient
ina serving of food cotroutes toa daly cet.2,000
caries a days used for general nuttin advice

Nutrition Facts

about 3.5 servings per container

Serving size   1/2 cup (130g)

Amount per serving

Calories 110

% Daily Value*

Total Fat 2g	3%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 120mg	5%
Total Carbohydrate 18g	7%
Dietary Fiber 4g	14%
Total Sugars 3g	
Includes 0g Added Sugars	0%
Protein 6g	

Vit. D 0mcg 0%	Calcium 30mg 2%
Iron 1.2mg 6%	Potas. 210mg 4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Nutrition Facts

about 3.5 servings per container

/Amount per serving
Calories 110
ally Value
Total Fat 2g 3%
Saturated Fat 0g 0%:
Trans Fat 0g
Cholesterol 0mg 0%
'Sodium 120mg 5%
Total Carbohydrate 189 T%

```
Dietary Fiber 4g 14%

Total Sugars 39
Includes 0g Added Sugars 0%:

Le
Vit. D Omcg 0% - © Calcium 30mg 2%
iron 1.2mg 6% Potas. 210mg 4%
SS

*The % Daily Vaue (DV) tes you how mucha nutient
ina serving of food cotroutes toa daly cet.2,000
calories a days used for general nuttin advice,
```

```python
#https://www.foodcity.com/product/501/0003680030796
url = "https://kvat-webassets.aisleahead.com/getMainImageSquare.php?
 ↪upc=0003680030796&size=800&order=4"
img = Image.open(requests.get(url, stream=True).raw)
img = img.convert('L')
display(img)
print(pytesseract.image_to_string(img))
```

Nutrition Facts

About 3.5 servings per container

Serving size	3/4 cup (125g)

Amount per serving

Calories 60

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 0mg	0%
Total Carbohydrate 15g	5%
Dietary Fiber 2g	7%
Sugars 12g	
Includes 0g Added Sugars	0%
Protein < 1g	
Vitamin D 0mcg	0%
Calcium 13mg	0%
Iron 0.5mg	2%
Potassium 222mg	4%
Vitamin C 22mg	25%

* The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2000 calories a day is used for general nutrition advice.

INGREDIENTS: PEACHES, STRAWBERRIES, RED SEEDLESS GRAPES, DARK SWEET CHERRIES, PINEAPPLES, ASCORBIC ACID, CITRIC ACID AND MALIC ACID TO PROMOTE COLOR.

CAUTION: PRODUCT IS PITTED MECHANICALLY AND MAY CONTAIN OCCASIONAL PITS OR PIT FRAGMENTS.

Nutrition Facts

About 3.5 servings per container
Serving size 3/4 cup (125g)
Sl

Amount per serving
Calories 60
% Daily Value*
Total Fat 0g
Saturated Fat 0g
Trans Fat 0g
Cholesterol 0mg

Sodium Omg
Total Carbohydrate 15g 5%
Dietary Fiber 2g 7%
Sugars 12g
Includes Og Added Sugars 0%
Protein < 1g

Vitamin D Omeg 0%
Calcium 13mg 0%
iron 0.5mg 2%
Potassium 222mg 4%
Vitamin C 22mg 25%
* The % Daily Value tells you how much a nutrient in

a serving of food contributes to a daily diet. 2000
calories a day is used for general nutrition advice

INGREDIENTS: PEACHES.

STRAWBERRIES. RED SEEDLESS

GRAPES, DARK SWEET CHERRIES.

PINEAPPLES. ASCORBIC ACID. CITRIC

Soren MALIC ACID TO PROMOTE
LOR.

CAUTION: PRODUCT IS PITTED
MECHANICALLY AND MAY CONTAIN
OCCASIONAL PITS OR PIT
FRAGMENTS.

```python
#https://www.foodcity.com/product/501/0003680011942
url = "https://kvat-webassets.aisleahead.com/getMainImageSquare.php?
 ↪upc=0003680011942&size=800&order=4"
img = Image.open(requests.get(url, stream=True).raw)
img = img.convert('L')
display(img)
print(pytesseract.image_to_string(img))
```

Nutrition Facts

About 7 servings per container

Serving size	1 cup (155g)

Amount per serving

Calories 70

	% Daily Value*
Total Fat 1g	**1%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 0mg	**0%**
Total Carbohydrate 19g	**7%**
Dietary Fiber 4g	**15%**
Sugars 13g	
Includes 0g Added Sugars	**0%**
Protein < 1g	
Vitamin D 0mcg	0%
Calcium 12mg	0%
Iron 0.3mg	0%
Potassium 84mg	0%

* The % Daily Value tells you how much a nutrient in a serving of food contributes to a daily diet. 2000 calories a day is used for general nutrition advice.

INGREDIENTS: BLUEBERRIES.

Nutrition Facts

About 7 servings per container
Serving size 1 cup (155g)
ST

Amount per serving
Calories 70
% Daily Value*

Total Fat 1g

Saturated Fat 0g

Trans Fat 0g
Cholesterol 0mg
Sodium 0mg

Total Carbohydrate 19g 7%
Dietary Fiber 4g 15%

Sugars 13g
Includes 0g Added Sugars 0%
Protein < 1g

Vitamin D 0meg 0%
Calcium 12mg 0%
lron 0.3mg 0%
Potassium 84mg 0%
* The % Daily Value tells you how much a nutrient in

a serving of food contributes to a daily diet. 2000
calories a day is used for general nutrition advice.

INGREDIENTS: BLUEBERRIES.

[59]:
```
#https://www.walmart.com/ip/Biena-8-oz-Rockin-Ranch-Roasted-Chickpea-Snacks/
 ↪752518102
url = "https://i5.walmartimages.com/asr/4e9e32d4-d1d7-4f33-b01b-c1bd1b688def.
 ↪5c7b14cf68e48253e7334d20ddc7aef3.jpeg?
 ↪odnHeight=612&odnWidth=612&odnBg=FFFFFF"
img = Image.open(requests.get(url, stream=True).raw)
print("downloaded image")
display(img)
imgL = img.convert('L')
print("displaying greyscale image")
display(imgL)
print(pytesseract.image_to_string(imgL))

img1 = img.convert('1')
print("displaying binary image")
display(img1)
print(pytesseract.image_to_string(img1))
```

downloaded image

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories 110

	% Daily Value*
Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

displaying greyscale image

Nutrition Facts

About 8 servings per container

Serving size 1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories 110

	% Daily Value*
Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

Nutrition Facts

About 8 servings per container

Serving size 1oz (28g/About
50 Chickpeas)

Amount Per Sei

Calories

Total Fat 3
Saturated Fat 0g
Trans Fat 0g

Cholesterol 0mg 0%

'Sodium 290mg 13%
Total Carbohydrate 169 6%
Dietary Fiber 6g 21%
Total Sugars 2g
Includes 19 Added Sugars 2%
tein 6g 9%
|
Vitamin D 0meg 0%
Calcium 30mg 2%
iron img 6%
Potassium 230mg 4%
The % Dally Value (OV) tells you how much a nutrient in a

serving offood contributes to a dally cit 2,000 calvies a day is
sed for general rtition ace,

displaying binary image

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories 110

% Daily Value*

Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

Nutrition Facts

About 8 servitigs per container
Serving size .don (28g/About

50.Chickpeas)

ee
Amount Ber Serving

Calories 410

% Bal

Yalue*

'Total Fai 2%
Saturated Fat Og a%
Trans Fat 0

Bholesterol img %
Sodium 43%

8%
24%

Protein 59

Vitarnin D Omeg
Calcium 30mg
tron img
Poisssiutn 2300

```python
from PIL import ImageEnhance

print(" greyscale image, before enhanceing")
display(imgL)

enhancer = ImageEnhance.Sharpness(imgL)

factor = 1
```

```
enImgL = enhancer.enhance(factor)
print("factor = {}".format(factor))
display(enImgL)

factor = 0.05
enImgL = enhancer.enhance(factor)
print("factor = {}".format(factor))
display(enImgL)

factor = 2
enImgL = enhancer.enhance(factor)
print("factor = {}".format(factor))
display(enImgL)
print(pytesseract.image_to_string(enImgL))
```

greyscale image, before enhanceing

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories   110

	% Daily Value*
Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

factor = 1

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories 110

% Daily Value*

Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

factor = 0.05

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories 110

	% Daily Value*
Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

factor = 2

Nutrition Facts

About 8 servings per container

Serving size   1oz (28g/About 50 Chickpeas)

Amount Per Serving

Calories   110

	% Daily Value*
Total Fat 3g	**4%**
Saturated Fat 0g	**0%**
Trans Fat 0g	
Cholesterol 0mg	**0%**
Sodium 290mg	**13%**
Total Carbohydrate 16g	**6%**
Dietary Fiber 6g	**21%**
Total Sugars 2g	
Includes 1g Added Sugars	**2%**
Protein 6g	**9%**
Vitamin D 0mcg	0%
Calcium 30mg	2%
Iron 1mg	6%
Potassium 230mg	4%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet 2,000 calories a day is used for general nutrition advice.

Nutrition Facts

About 8 servings per container
Serving size 1o0z (28g/About

50 Chickpeas)
ee

Amount Per Serving

37

Calories 110

% Daily Valu

Total Fat 39 4%
Saturated Fat 0g 0%
Trans Fat 0g

Cholesterol 0mg 0%

'Sodium 290mg 13%
Total Carbohydrate 16g 6%
Dietary Fiber 6g
Total Sugars 2g

includes 1g Added Sugars 2%
Protein 9%
a |
Vitamin D 0meg 0%
Calcium 30mg 2%
iron img 6%
Potassium 280mg 4%

"The % Daily Value (DV) tells you how much a nutrient in a
serving of food contbutes toa dally cit 2,000 calvies a day is
sed for general nuttin ace,

[ ]: