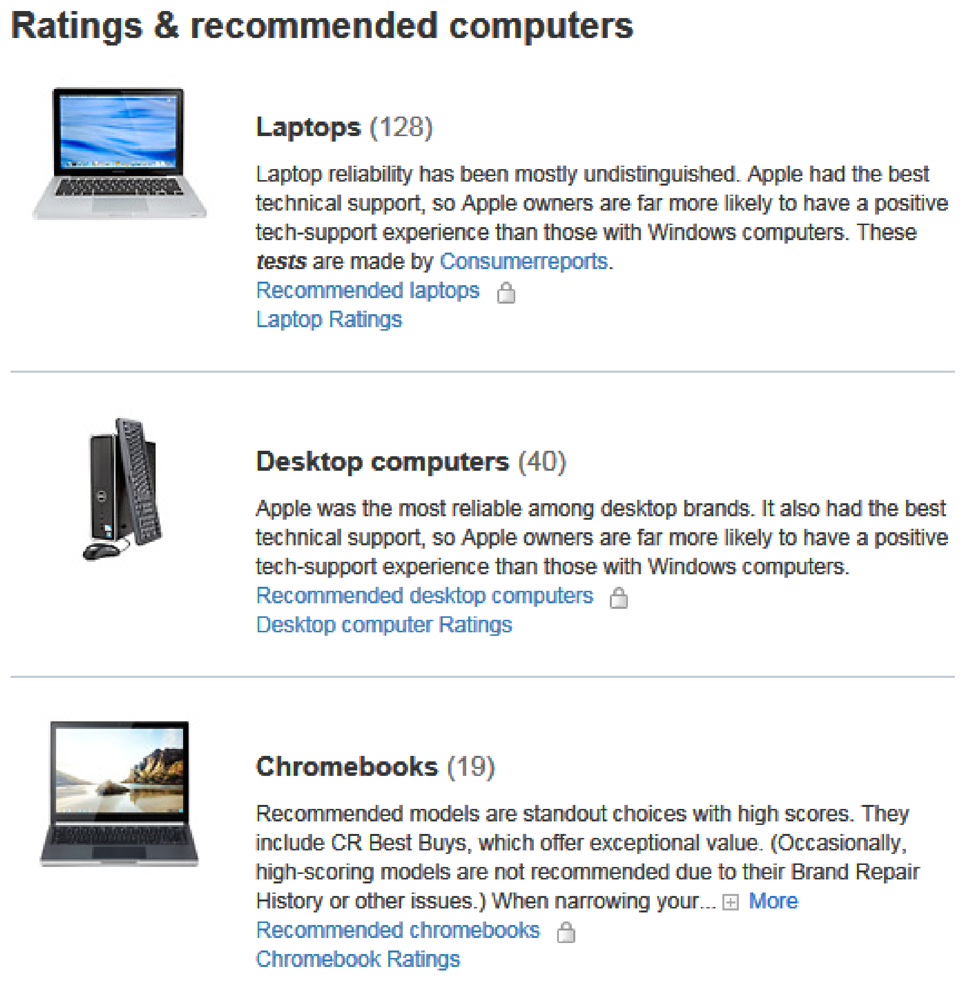
ADVENTURES IN DATA MUNGING

Computers and Consumer Reports

GETTING THE DATA

- Selenium
- Scrapy Spider
- Selenium

- Site organization:



Ratings & recommended computers

Laptops (128)

Laptop reliability has been mostly undistinguished. Apple had the best technical support, so Apple owners are far more likely to have a positive tech-support experience than those with Windows computers. These *tests* are made by Consumerreports.

Recommended laptops

Laptop Ratings

Desktop computers (40)

Apple was the most reliable among desktop brands. It also had the best technical support, so Apple owners are far more likely to have a positive tech-support experience than those with Windows computers.

Recommended desktop computers

Desktop computer Ratings

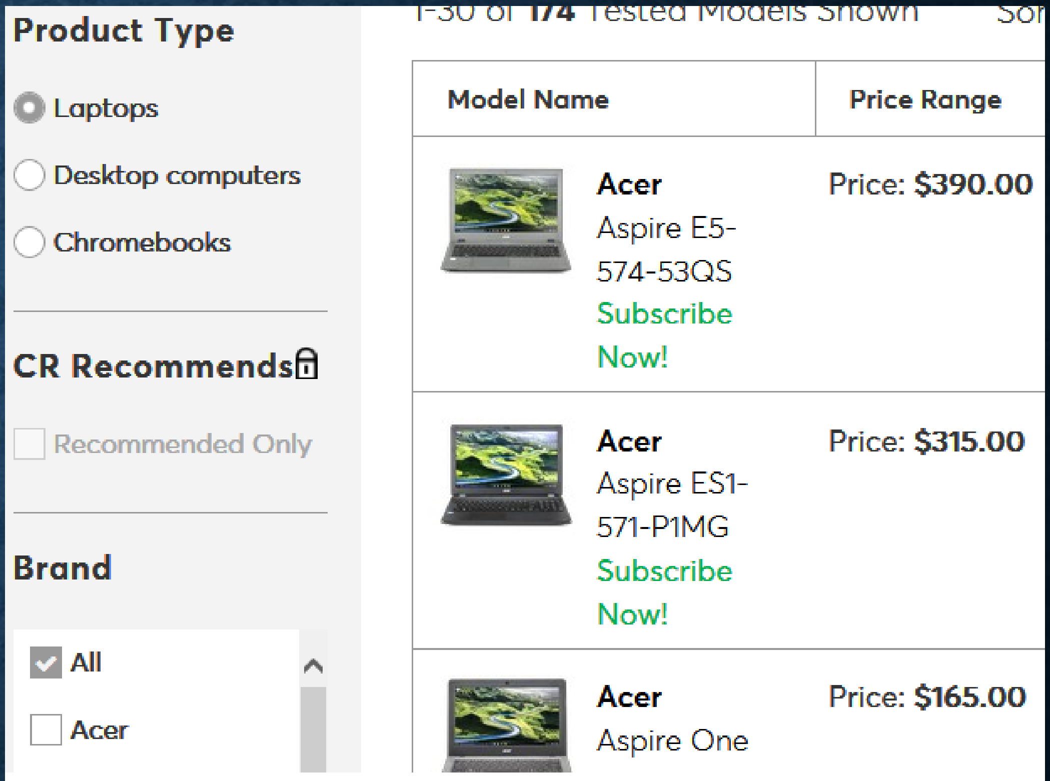
Chromebooks (19)

Recommended models are standout choices with high scores. They include CR Best Buys, which offer exceptional value. (Occasionally, high-scoring models are not recommended due to their Brand Repair History or other issues.) When narrowing your... ⊞ More

Recommended chromebooks

Chromebook Ratings

Level I:



Product Type

● Laptops

○ Desktop computers

○ Chromebooks

CR Recommends

□ Recommended Only

Brand

☑ All

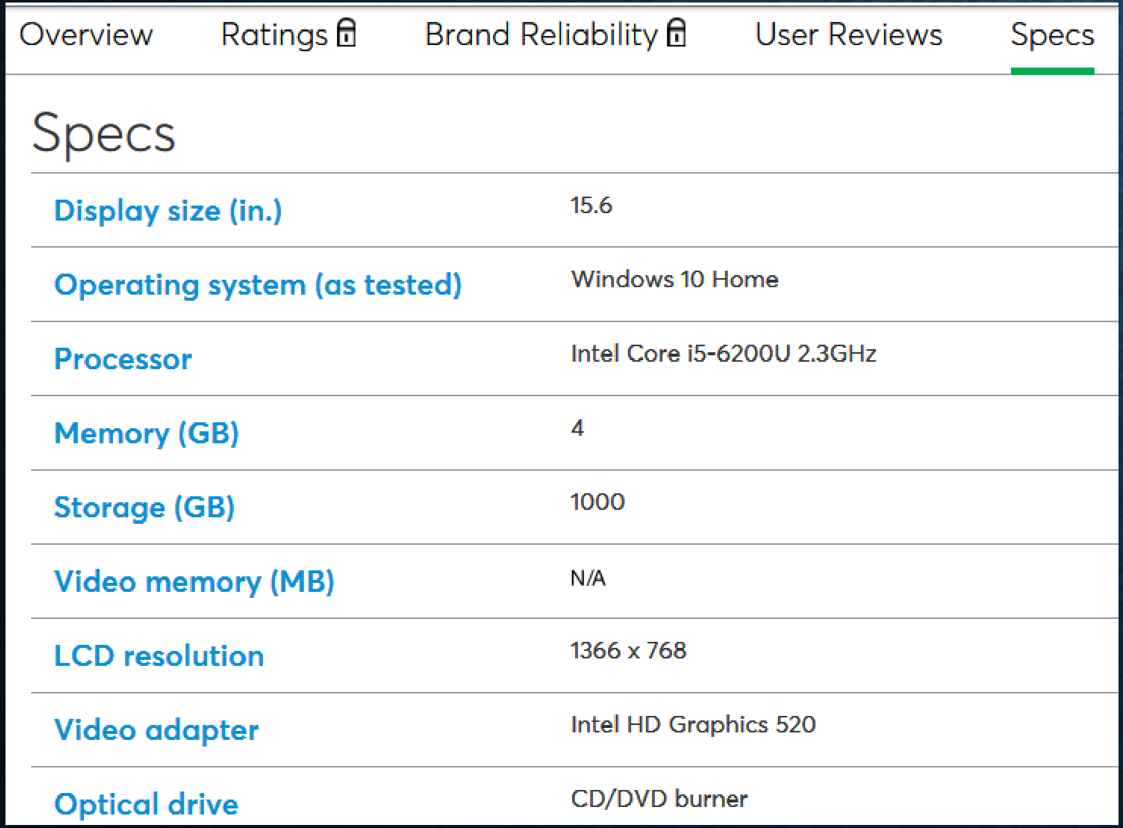
□ Acer

1-30 of 174 Tested Models Shown Sor

Model Name	Price Range
Acer Aspire E5-574-53QS Subscribe Now!	Price: **$390.00**
Acer Aspire ES1-571-P1MG Subscribe Now!	Price: **$315.00**
Acer Aspire One	Price: **$165.00**

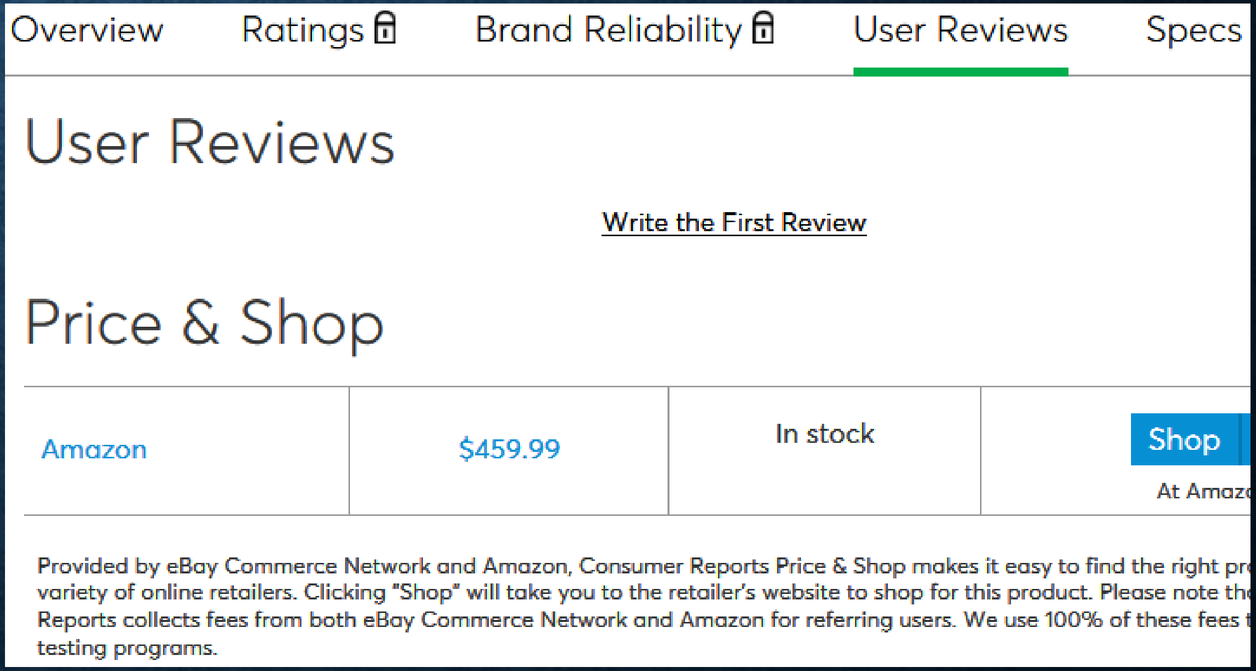
SITE LEVEL II

- Sometimes a Link is not just a link:
  - https://www.consumerreports.org/products/laptop/acer-aspire-e5-574-53qs-385910/specs
  - https://www.consumerreports.org/products/laptop/acer-aspire-e5-574-53qs-385910/user-reviews



Specs

Display size (in.)	15.6
Operating system (as tested)	Windows 10 Home
Processor	Intel Core i5-6200U 2.3GHz
Memory (GB)	4
Storage (GB)	1000
Video memory (MB)	N/A
LCD resolution	1366 x 768
Video adapter	Intel HD Graphics 520
Optical drive	CD/DVD burner



User Reviews

Write the First Review

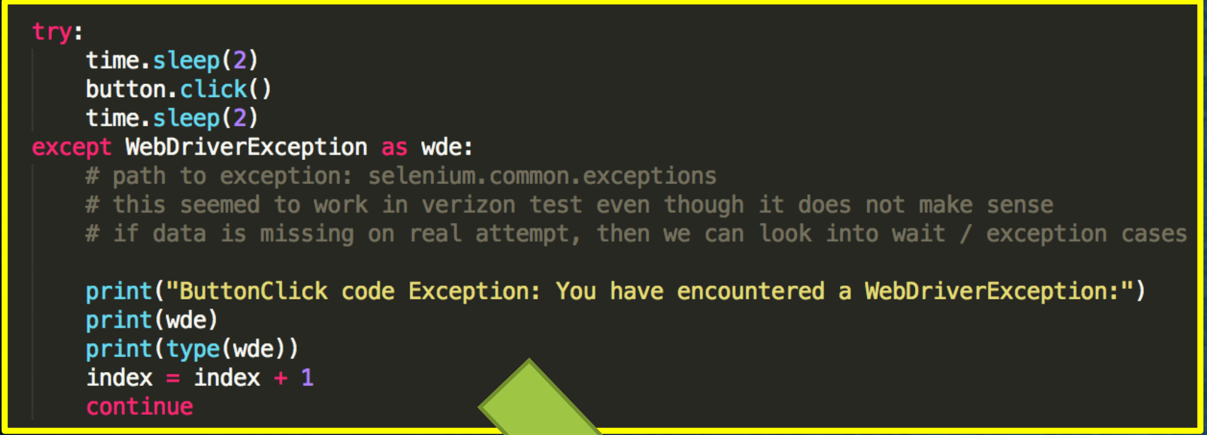
Price & Shop

Amazon	$459.99	In stock	Shop At Amaz

Provided by eBay Commerce Network and Amazon, Consumer Reports Price & Shop makes it easy to find the right pr variety of online retailers. Clicking "Shop" will take you to the retailer's website to shop for this product. Please note th Reports collects fees from both eBay Commerce Network and Amazon for referring users. We use 100% of these fees t testing programs.

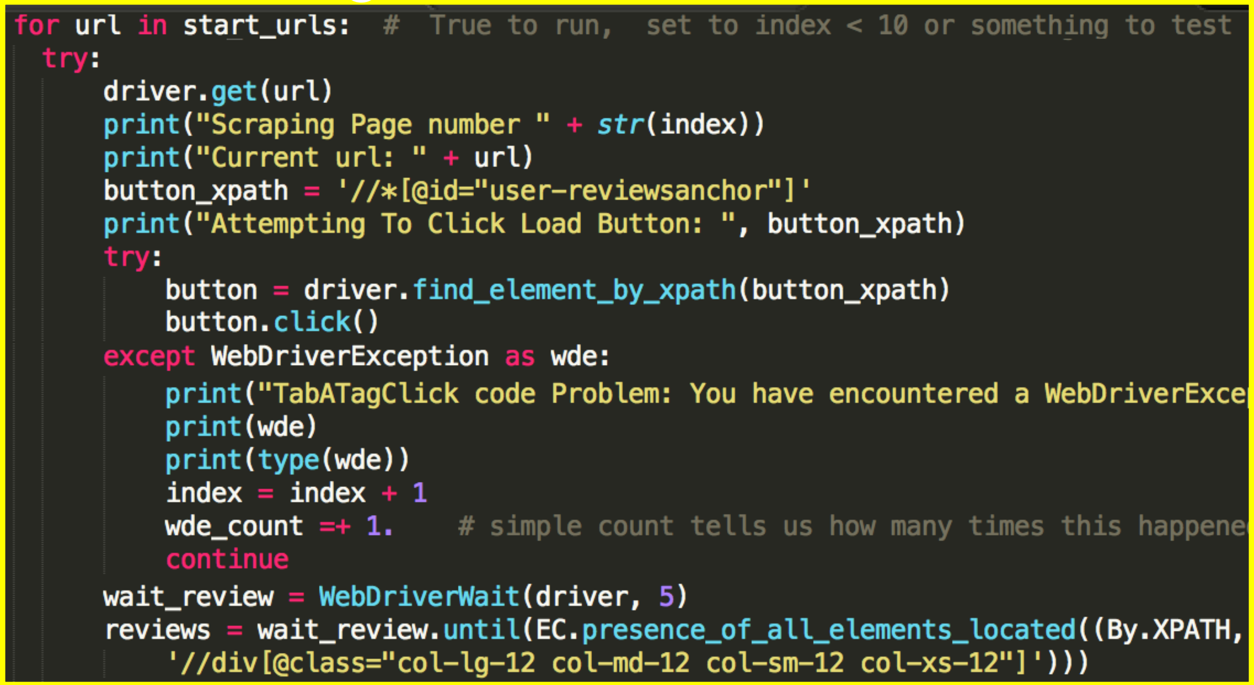
WHAT WORKS FOR ONE PART OF A SITE DOESN'T ALWAYS WORK FOR ANOTHER

Selenium



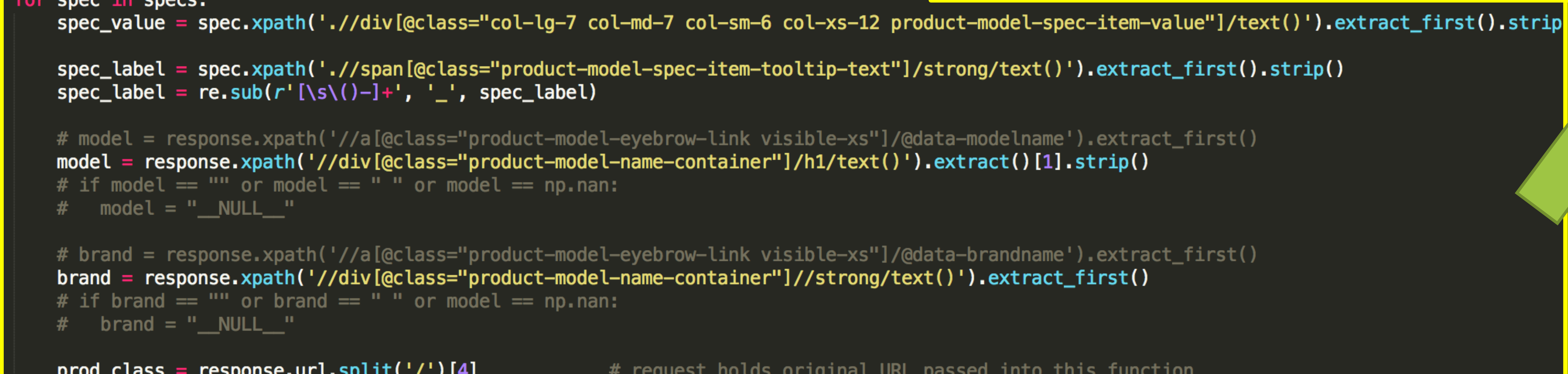
```
try:
    time.sleep(2)
    button.click()
    time.sleep(2)
except WebDriverException as wde:
    # path to exception: selenium.common.exceptions
    # this seemed to work in verizon test even though it does not make sense
    # if data is missing on real attempt, then we can look into wait / exception cases

    print("ButtonClick code Exception: You have encountered a WebDriverException:")
    print(wde)
    print(type(wde))
    index = index + 1
    continue
```

Selenium Again



```
for url in start_urls:  #  True to run,  set to index < 10 or something to test
  try:
      driver.get(url)
      print("Scraping Page number " + str(index))
      print("Current url: " + url)
      button_xpath = '//*[@id="user-reviewsanchor"]'
      print("Attempting To Click Load Button: ", button_xpath)
      try:
          button = driver.find_element_by_xpath(button_xpath)
          button.click()
      except WebDriverException as wde:
          print("TabATagClick code Problem: You have encountered a WebDriverExce
          print(wde)
          print(type(wde))
          index = index + 1
          wde_count =+ 1.     # simple count tells us how many times this happene
          continue
      wait_review = WebDriverWait(driver, 5)
      reviews = wait_review.until(EC.presence_of_all_elements_located((By.XPATH,
          '//div[@class="col-lg-12 col-md-12 col-sm-12 col-xs-12"]')))
```

Scrapy Spider

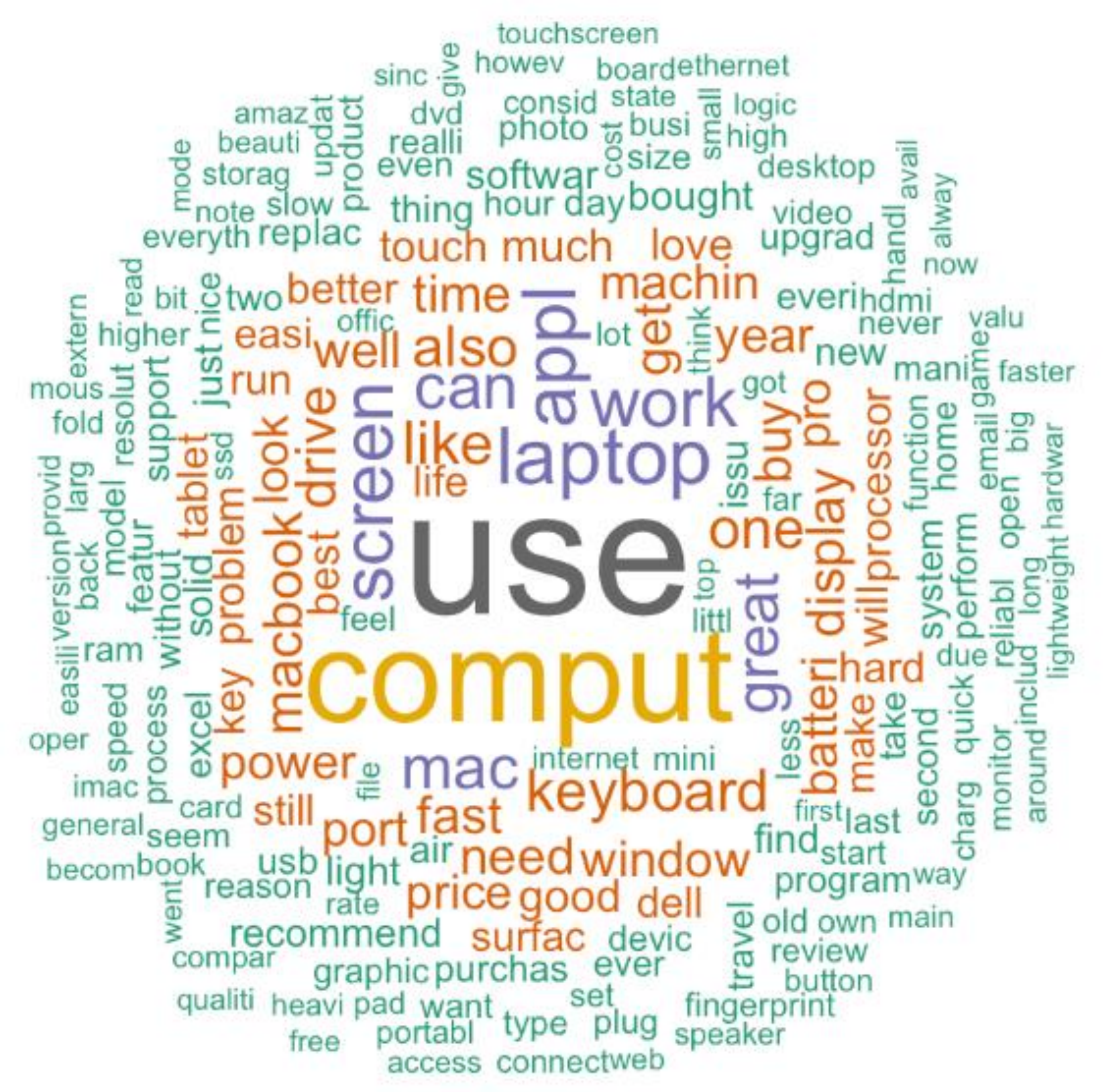


```
specs = response.xpath('//div[@class="product-model-spec-container"]//div[@class="row

for spec in specs:
    spec_value = spec.xpath('.//div[@class="col-lg-7 col-md-7 col-sm-6 col-xs-12 product-model-spec-item-value"]/text()').extract_first().strip

    spec_label = spec.xpath('.//span[@class="product-model-spec-item-tooltip-text"]/strong/text()').extract_first().strip()
    spec_label = re.sub(r'[\s\()-]+', '_', spec_label)

    # model = response.xpath('//a[@class="product-model-eyebrow-link visible-xs"]/@data-modelname').extract_first()
    model = response.xpath('//div[@class="product-model-name-container"]/h1/text()').extract()[1].strip()
    # if model == "" or model == " " or model == np.nan:
    #   model = "__NULL__"

    # brand = response.xpath('//a[@class="product-model-eyebrow-link visible-xs"]/@data-brandname').extract_first()
    brand = response.xpath('//div[@class="product-model-name-container"]//strong/text()').extract_first()
    # if brand == "" or brand == " " or model == np.nan:
    #   brand = "__NULL__"

    prod_class = response.url.split('/')[4]           # request holds original URL passed into this function
```

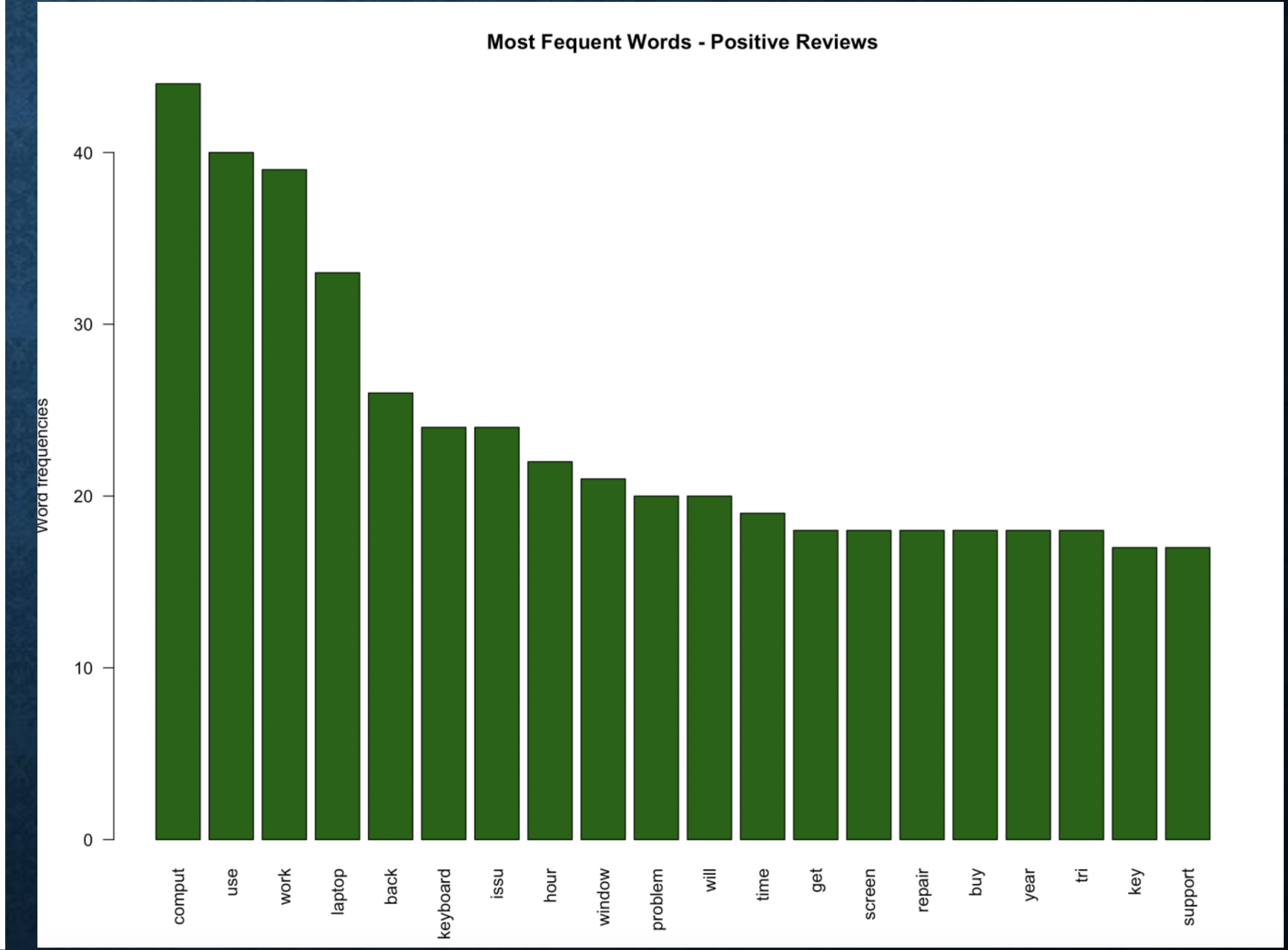
MODULAR ITERATIVE APPROACH

- Get All The Data Up Front
- Some Transformation with Scrapers for Some Known Patterns
- Create CSV Spreadsheet Each Step Of The Way
- Load into R or Jupyter Module – Whichever One “Feels Faster”
- Generate Sheet of Data
- Use Data In Analysis
- Go Back to Source and Do It All Again
- You Don’t Build Everything You Want But You Do Build Something
- Each Sheet Along The Way Allows You to Pick Up Where You Left Off Without Rerunning Code

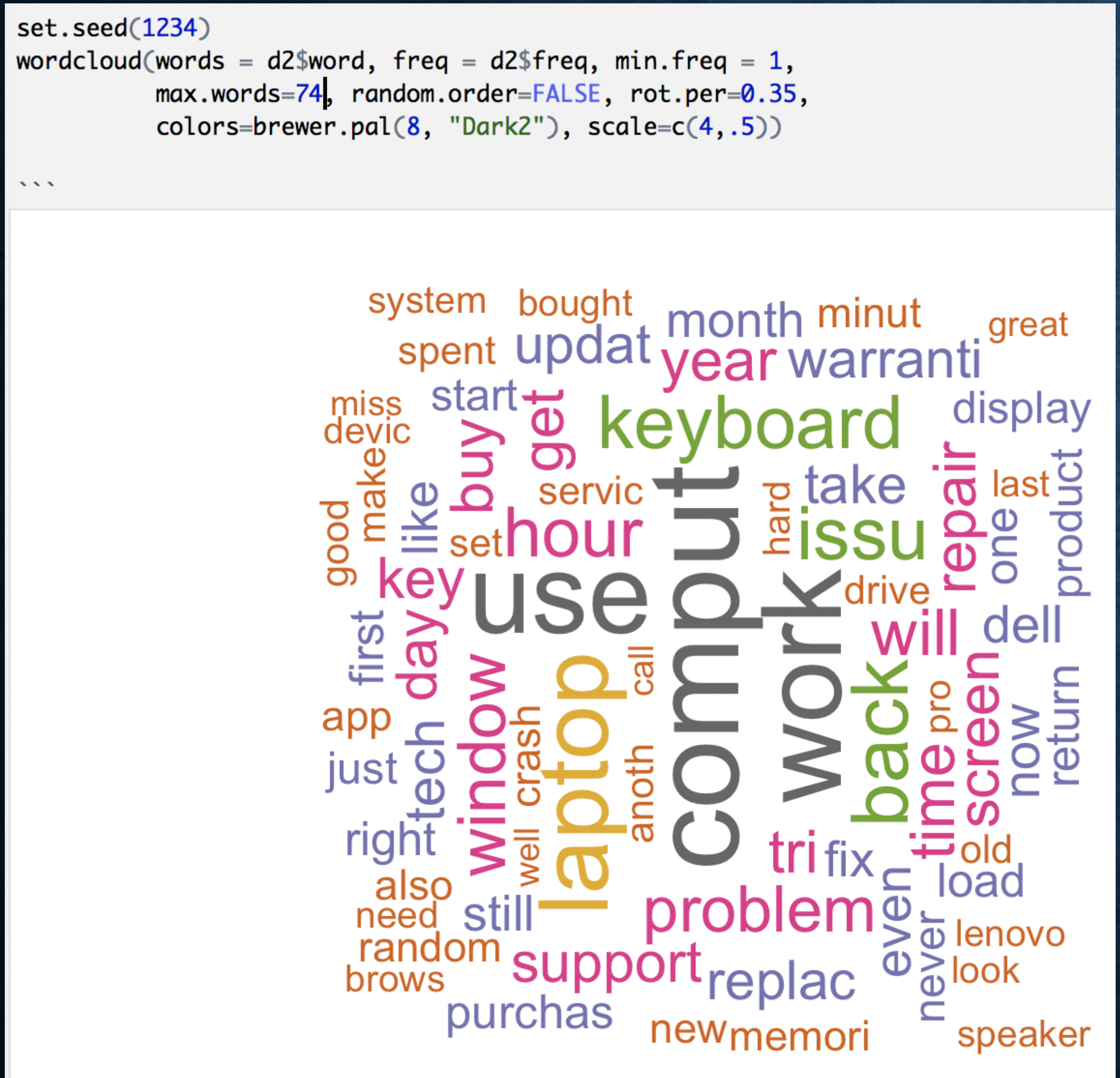
WORD CLOUDS: REVIEW DATA POSITIVE REVIEWS

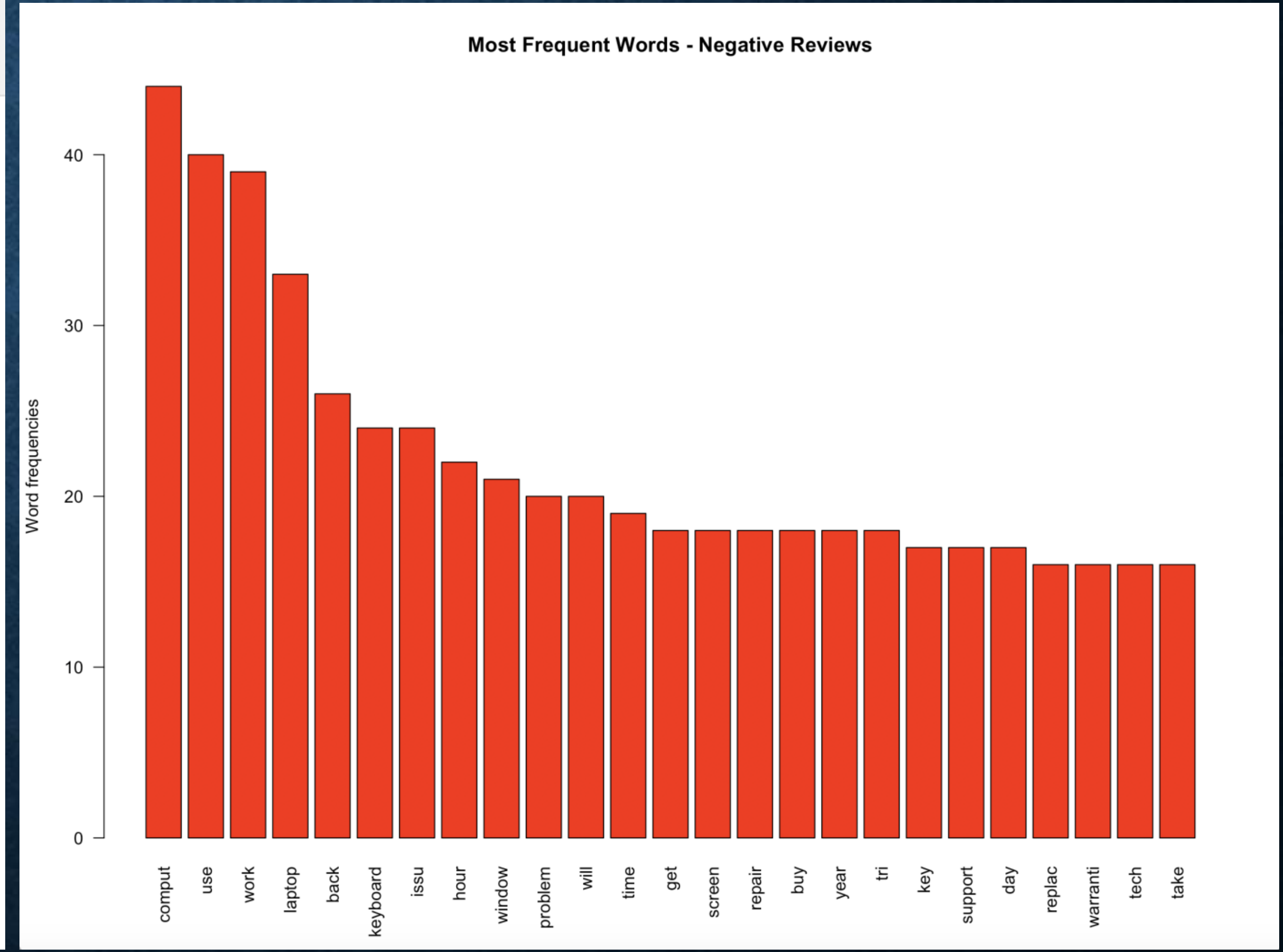


Top 25 By Frequency:

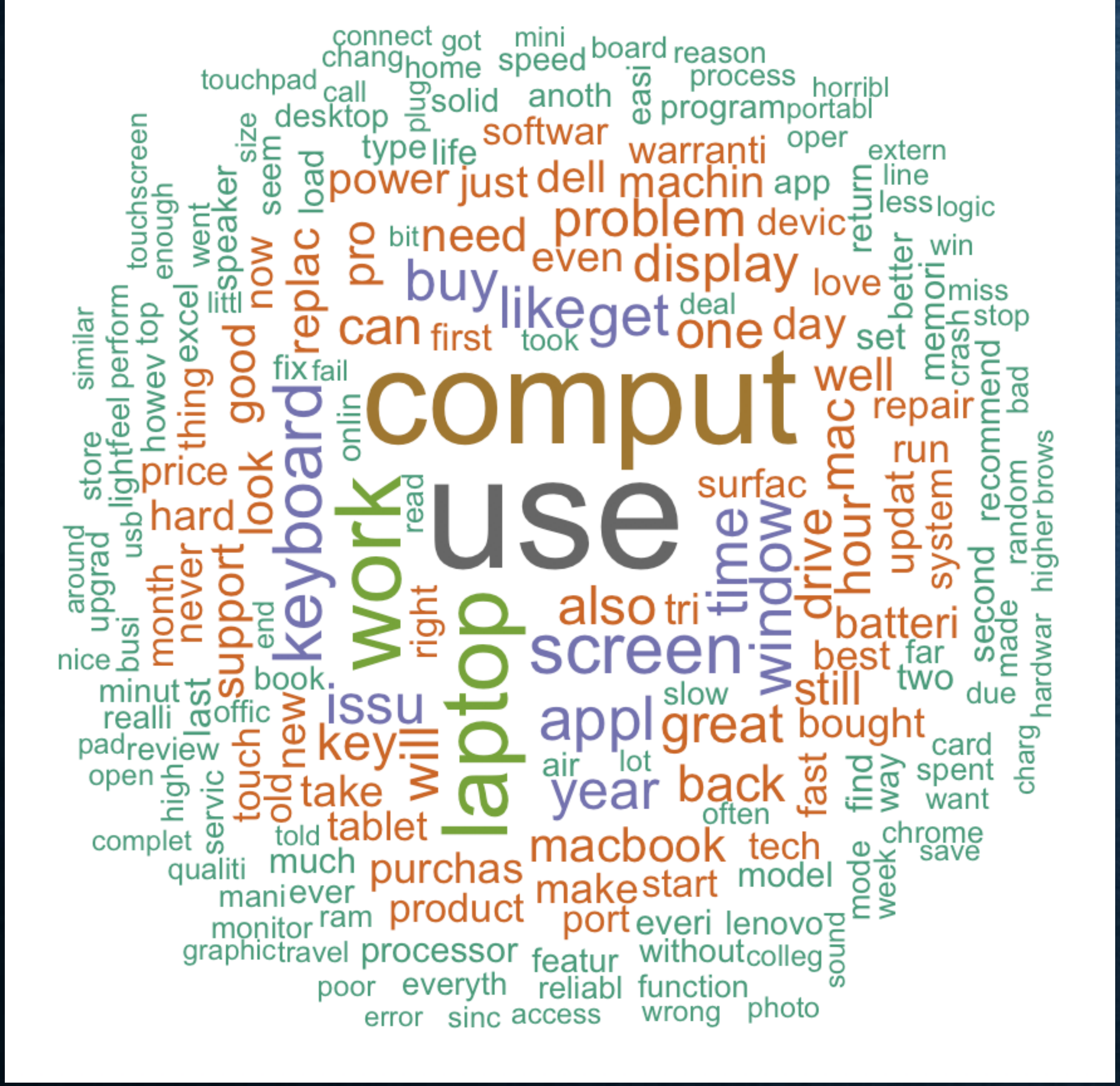


WORD CLOUDS: REVIEW DATA
NEGATIVE REVIEWS

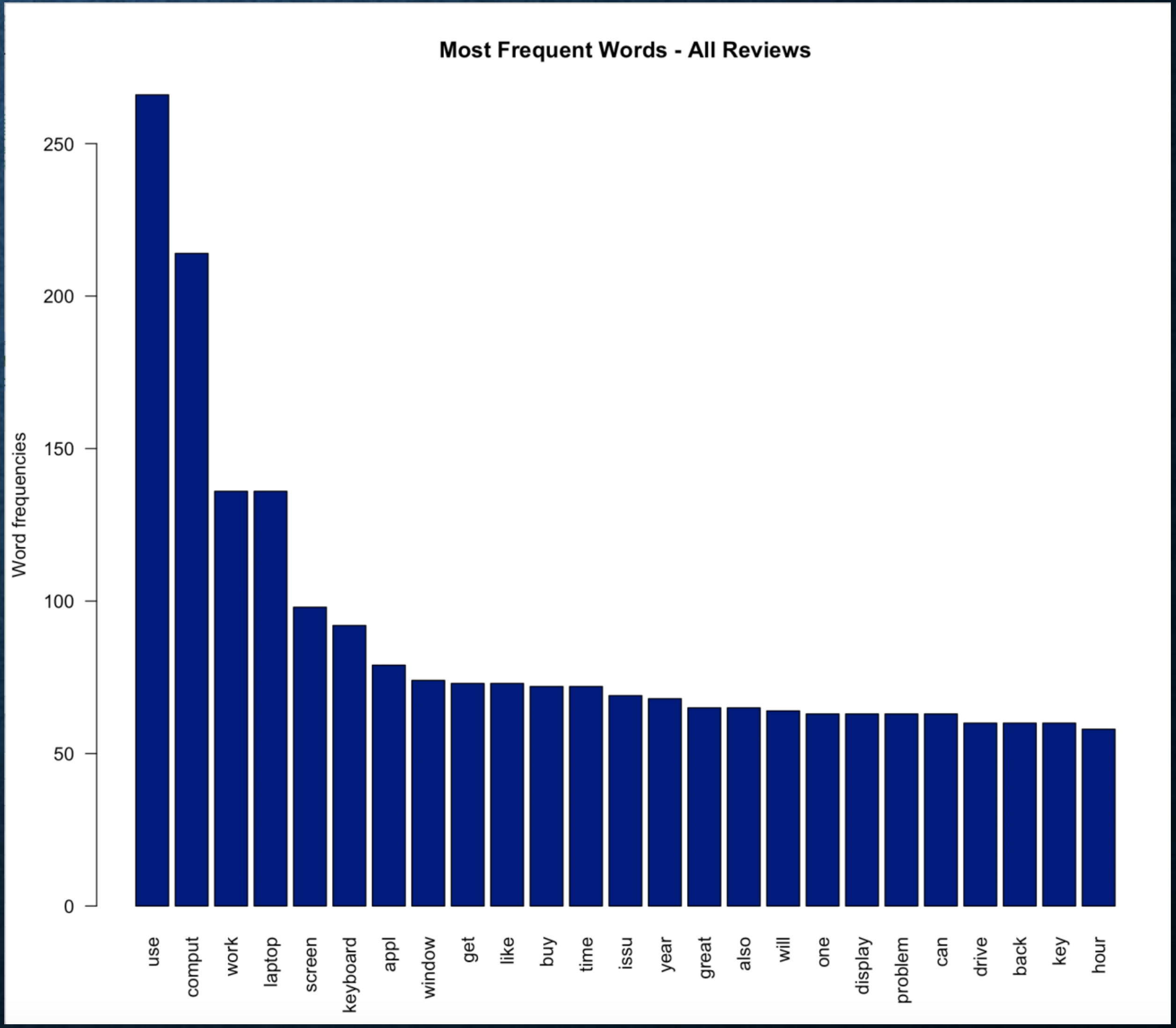


```
set.seed(1234)
wordcloud(words = d2$word, freq = d2$freq, min.freq = 1,
          max.words=74, random.order=FALSE, rot.per=0.35,
          colors=brewer.pal(8, "Dark2"), scale=c(4,.5))

```
```

Top 25 By Frequency:


```

WORD CLOUDS: REVIEW DATA
ALL REVIEWS



Top 25 By Frequency:



ANALYSIS OF SPECIFICATIONS WITH MATPLOTLIB AND SEABORN

- A Jupyter Notebook Saved to HTML provides a convenient way to tell this story:
  - Source: "TMWP_CR_Spec_TableAnalysis1.ipynb"
  - In HTML: "TMWP_CR_Spec_TableAnalysis1.html"
- High Level – We Look At:
  - New Features – Coverage by Consumer Reports
  - Little Bit About RAM and Price
  - 53 Variables were collected for 268 Desktop, Laptop, and Chromebook Products were collected, but each one, even with work performed inline by scrapers, still required work to prepare it for analysis.