Stanford CoreNLP and Memory Issues

Stanford CoreNLP (Java version)

In the Stanford CoreNLP GitHub website we read (https://stanfordnlp.github.io/CoreNLP/memory-time.html):

“**People not infrequently complain that Stanford CoreNLP is slow or takes a ton of memory.** In some configurations this is true. In other configurations, this is not true….”

Mannin advice https://stackoverflow.com/questions/29352149/stanford-parser-out-of-memory

Where does all the memory go when using Stanford CoreNLP?

There are three big places that memory goes:

1. Large machine learning models (mainly arrays and maps of Strings for features and floats or doubles for parameters) which are stored in memory (**annotator type matters!**)
2. The annotated document that is stored in memory (**document size matters!**).
3. Very large data structures in memory that are used by some NLP algorithms (**sentence size matters!**)

Secret number 1 for memory problems: The annotator you choose matters

"How slow and memory intensive CoreNLP is depends on the annotators you choose. This is the first rule. … Of course, sometimes the choices that are fast and memory efficient aren't the choices that produce the highest quality annotations. Sometimes you have to make trade-offs."

"Some uses of CoreNLP don't need much time or space. It can just tokenize and sentence split text using very little time and space. It can do this on the sample text while giving Java just 20MB of memory…. So, the first thing to know is that **CoreNLP will be slow and take a lot of memory if and only if you choose annotators and annotation options that are slow and use a lot of memory**."

Currently, the largest models in the default pipeline are the neural networks for statistical coreference.

The shift-reduce constituency parser also has very large models. If you run without them, you can annotate the sample document in 2GB of RAM. … But once you include coreference … then the system really needs 4GB of RAM for this document (and if you run constituency parsing and coreference on a large document, you can easily need 5–6GB of RAM).

So… if a parser blows up your memory, a better way to lessen memory use is to use a different parser.

The Java memory grabber

Java is the main culprit in gobbling up memory. "Strings are internally memory-expensive in Java. Each token is represented as an Object, which stores various token attributes, such as token offsets, which are themselves represented as Objects. **These Java tasks use up plenty of memory.**

Secret number 2 for memory problems: Limit document size

"A whole "document" is represented in memory while processing it. Therefore, if you have a large file, like a novel, the next secret to reducing memory usage is to not treat the whole file as a "document". **Process a large file a piece, say a chapter, at a time, not all at once."**

Secret number 3 for memory problems: Limit sentence size

The Stanford CoreNLP traditional englishPCFG.ser.gz constituency parsing takes memory space proportional to the square of the longest sentence length, with a large constant factor. "Parsing sentences that are hundreds of words long will take additional gigabytes of memory just for the parser data structures. **The easiest fix for that is just to not parse super-long sentences.** You can do that with a property like: **-parse.maxlen** 70. This can be a fine solution for something like web pages or newswire, where anything over 70 words is likely a table or list or something that isn't a real sentence. However, it is unappealing for James Joyce: Several of the sentences in Chapter 13 are over 100 words but are well-formed, proper sentences. For example, here is one of the longer sentences in the chapter:

> Her griddlecakes done to a goldenbrown hue and queen Ann's pudding of delightful creaminess had won golden opinions from all because she had a lucky hand also for lighting a fire, dredge in the fine selfraising flour and always stir in the same direction, then cream the milk and sugar and whisk well the white of eggs though she didn't like the eating part when there were any people that made her shy and often she wondered why you couldn't eat something poetical like violets or roses and they would have a beautifully appointed drawingroom with pictures and engravings and the photograph of grandpapa Giltrap's lovely dog Garryowen that almost talked it was so human and chintz covers for the chairs and that silver toastrack in Clery's summer jumble sales like they have in rich houses.

Nevertheless, in general, very long sentences blow out processing time and memory. One thing to be aware of is that CoreNLP currently uses simple, heuristic sentence splitting on sentence terminators like '.' and '?'. If you are parsing "noisy" text without explicit sentence breaks – this often happens if you parse things like tables or web pages – you can end up with "sentences" more than 500 words long, which it isn't even useful to try to parse. You should either clean these up in data preprocessing or limit the sentence length that annotators try to process. Several annotators support a maximum sentence length property and will simply skip processing of longer sentence. The most commonly useful of these is **parse.maxlen** but there is also **kbp.maxlen**, **ner.maxlen**, and **pos.maxlen**."

Find out how much memory your computer has

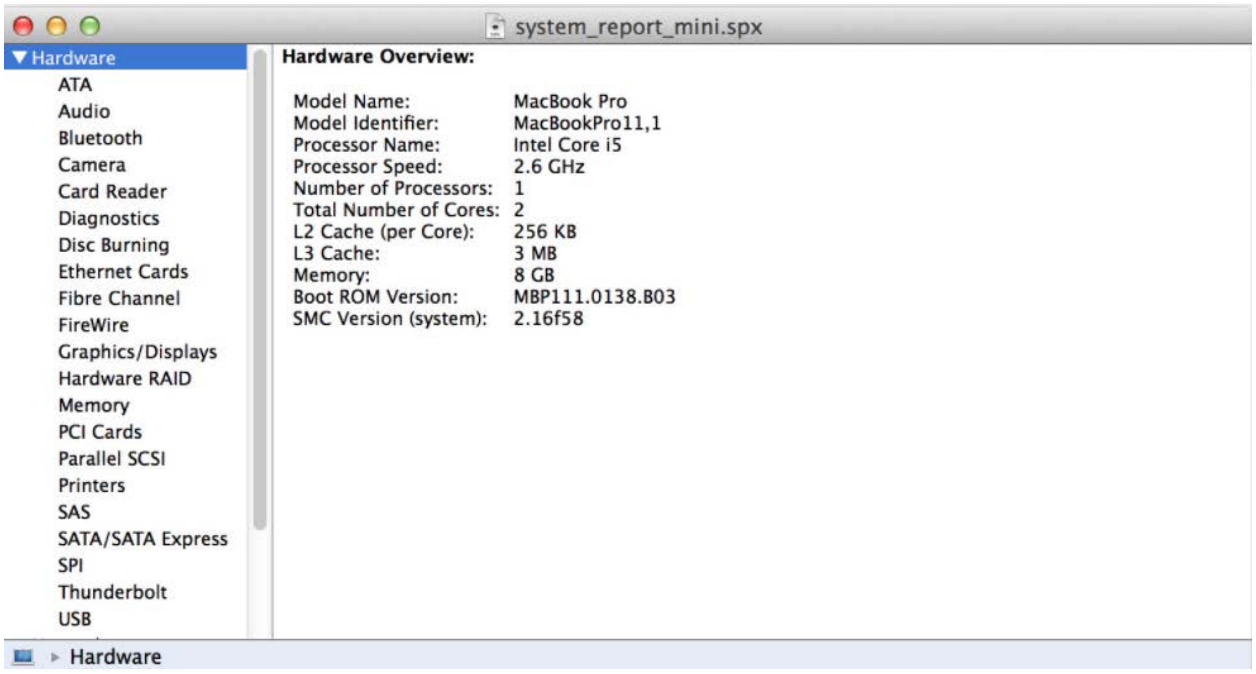
The NLP Suite automatically checks the memory size available on your computer when you run Stanford CoreNLP. But… you can check yourslf following these instructions. **8GB of memory may not be enough to run some of the more resourse-demanding annotators (e.g., parser) on large files.**

Mac

Via command line

Open command line and type:

```
System_profiler -detailLevel mini -xml > ~/Desktop/system_report_mini.spx
```

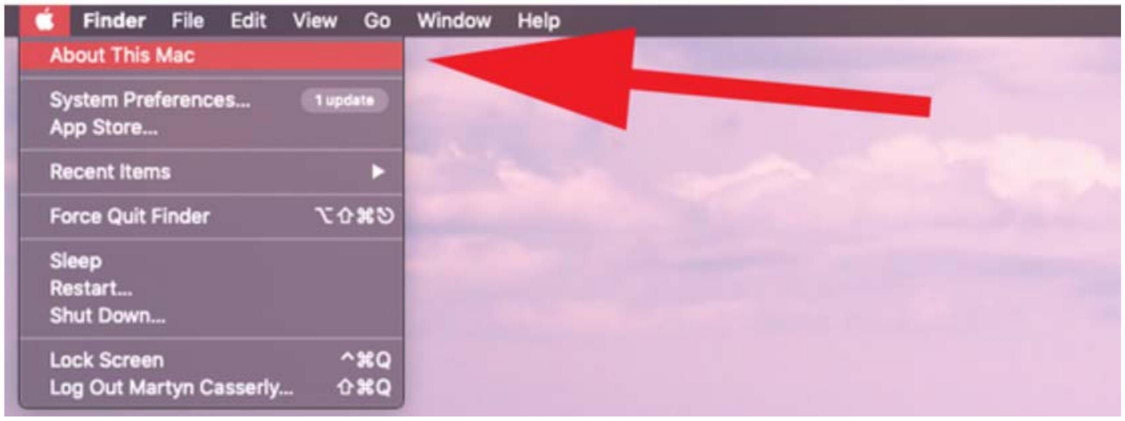


Hardware Overview:

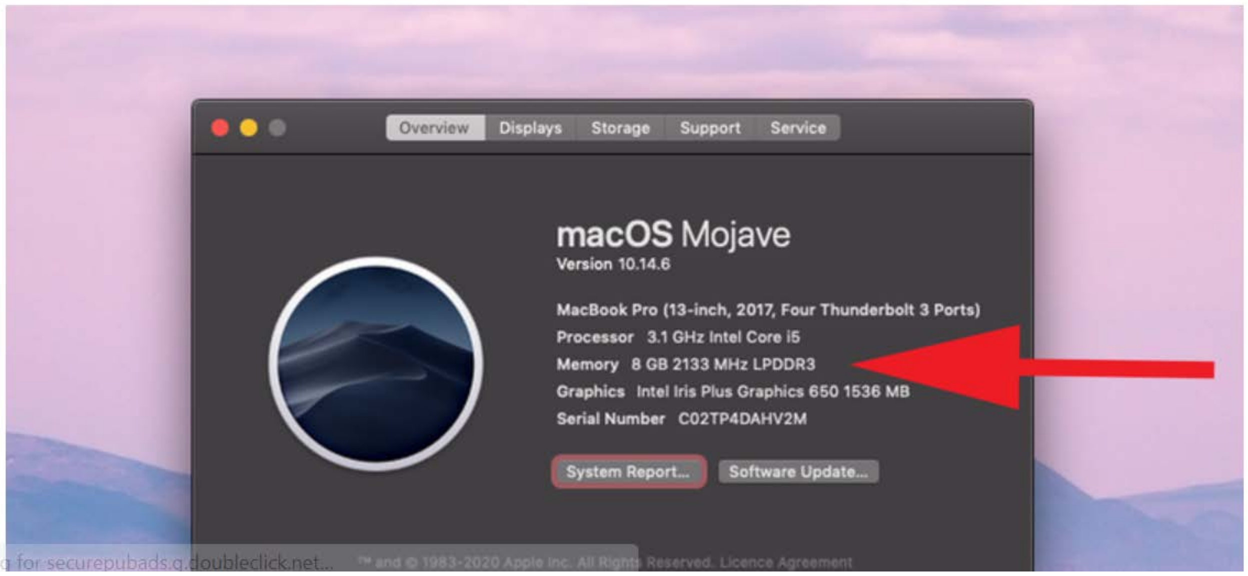
```
Model Name:              MacBook Pro
Model Identifier:        MacBookPro11,1
Processor Name:          Intel Core i5
Processor Speed:         2.6 GHz
Number of Processors:    1
Total Number of Cores:   2
L2 Cache (per Core):     256 KB
L3 Cache:                3 MB
Memory:                  8 GB
Boot ROM Version:        MBP111.0138.B03
SMC Version (system):    2.16f58
```

Via About This Mac pane

1. Click on the Apple symbol in the top left corner of your screen.
2. Then select **About This Mac** from the menu that appears.



3. In the box that appears you'll see various details, including the installed version of macOS, model name, and the amount of Memory, which is another name for RAM. On our test MacBook Pro, as you can see from the image below, we have 8GB of RAM.



macOS Mojave
Version 10.14.6

MacBook Pro (13-inch, 2017, Four Thunderbolt 3 Ports)
Processor 3.1 GHz Intel Core i5
Memory 8 GB 2133 MHz LPDDR3
Graphics Intel Iris Plus Graphics 650 1536 MB
Serial Number C02TP4DAHV2M

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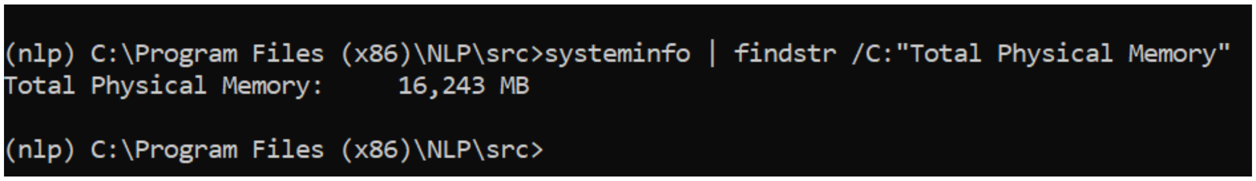
Windows

Via command line

In command line type:

systeminfo | findstr /C:"Total Physical Memory"



```
(nlp) C:\Program Files (x86)\NLP\src>systeminfo | findstr /C:"Total Physical Memory"
Total Physical Memory:     16,243 MB

(nlp) C:\Program Files (x86)\NLP\src>
```

You have 16GB of memory, using the formula to convert 16,243 MB to GB:

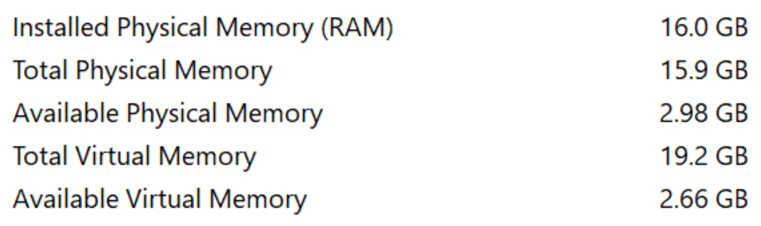
1 MB = 0.0009765625 GB

16,243 MB × 0.0009765625 GB = 15.86230469 GB

Via Windows Start menu

Click on the Windows Start menu and type in System Information. A list of search results pops up, among which is the System Information utility. Click on it. Scroll down to Installed Physical Memory (RAM) and see how much memory is installed on your computer.

You will see in a long list of items:



Installed Physical Memory (RAM)	16.0 GB
Total Physical Memory	15.9 GB
Available Physical Memory	2.98 GB
Total Virtual Memory	19.2 GB
Available Virtual Memory	2.66 GB

JAVA

How do I switch Java 32-bits to Java 64-bits? Uninstalling and installing Java versions

1. Download Java 64-bits
2. Uninstall the 32bit version

To Uninstall …

1. Click Start

2. Select Settings

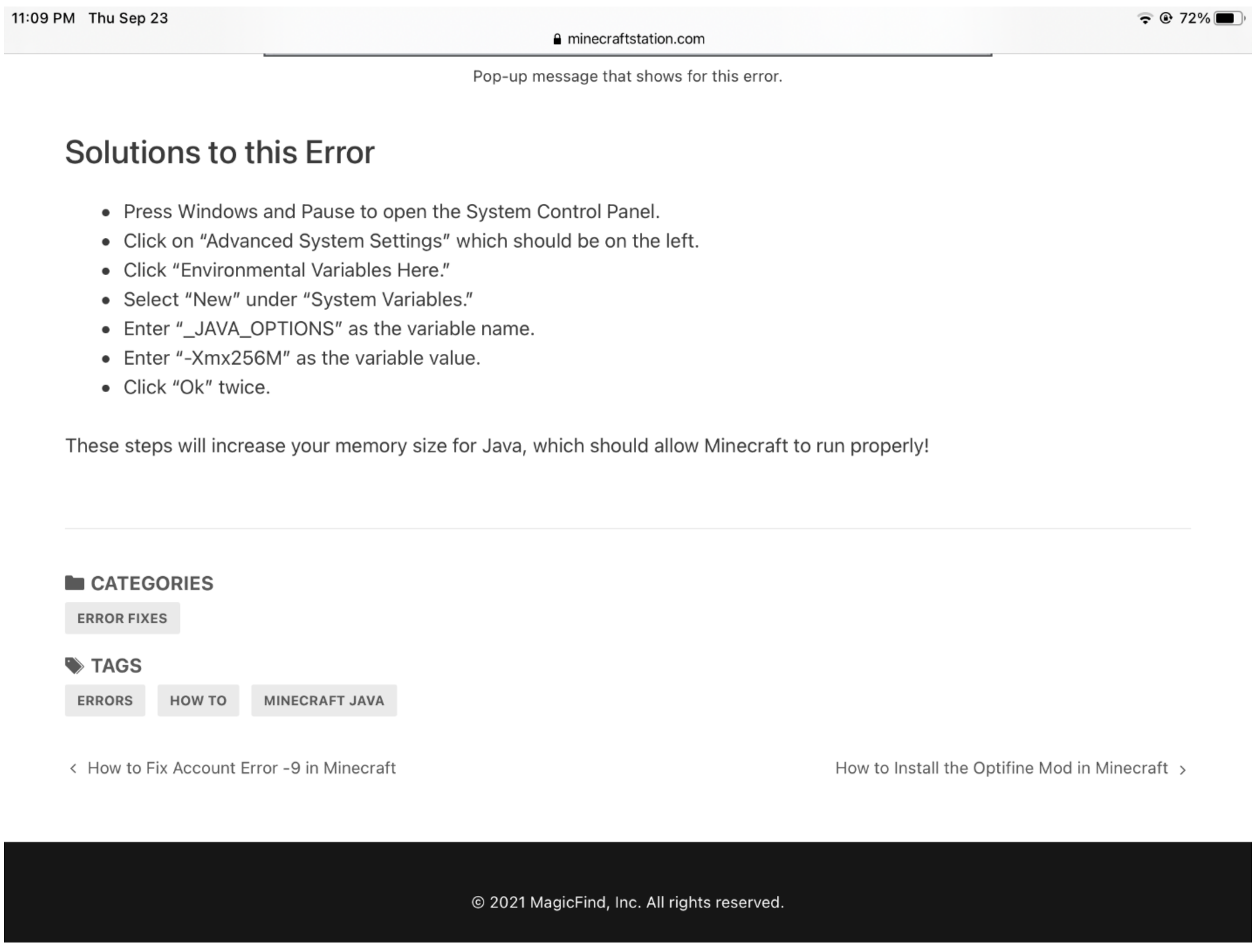
3. Select System

4. Select Apps & features

5. Select the program to uninstall and then click its Uninstall button.

6. Respond to the prompts to complete the uninstall

and download 64-bits version here https://javadl.oracle.com/webapps/download/Auto...



11:09 PM Thu Sep 23 minecraftstation.com 72%

Pop-up message that shows for this error.

Solutions to this Error

- Press Windows and Pause to open the System Control Panel.
- Click on "Advanced System Settings" which should be on the left.
- Click "Environmental Variables Here."
- Select "New" under "System Variables."
- Enter "_JAVA_OPTIONS" as the variable name.
- Enter "-Xmx256M" as the variable value.
- Click "Ok" twice.

These steps will increase your memory size for Java, which should allow Minecraft to run properly!

CATEGORIES

ERROR FIXES

TAGS

ERRORS HOW TO MINECRAFT JAVA

‹ How to Fix Account Error -9 in Minecraft

How to Install the Optifine Mod in Minecraft ›

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Display heap size settings

Go to command line and type

Mac

```
java -XX:+PrintFlagsFinal -version | grep HeapSize
```

Windows

Replace grep with findstr

```
java -XX:+PrintFlagsFinal -version | findstr HeapSize
```

Setup Java heap size options

Go to command line and type

```
set JAVA_OPTS="Xms264M" Minimum
set JAVA_OPTS="Xmx1024M" Maximum
```

Replace M (Megabyte) to G for Gigabyte

Recommendations about heap size

It is recommended to increase the Java heap space only up to one-half of the total RAM available on the server. Increasing the Java heap space beyond that value can cause performance problems. For example, if your server has 16 GB of RAM available, then the maximum heap space you should use is 8 GB.

Initial heap size is 1/64th of the computer's physical memory or reasonable minimum based on platform (whichever is larger) by default. The initial heap size can be overridden using -Xms. Maximum heap size is 1/4th of the computer's physical memory or 1 GB (whichever is smaller) by default.

Use -Xmx to specify the maximum heap size.

Use -Xms to specify the initial Java heap size.

Use -Xss to set the Java thread stack size.

Use the arguments -Xms<number>M -Xmx<number>M. Change M to G for indicating Megs and Gigs of bytes respectively. -Xms indicates the minimum and -Xmx the maximum.