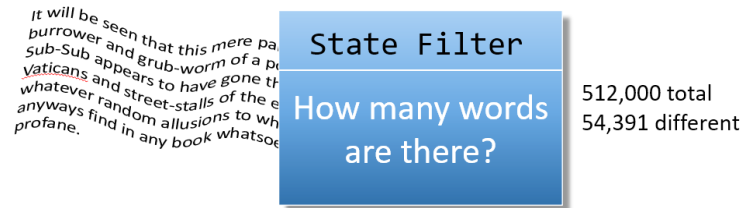# State Filters

State filters <mark>produce information</mark> by learning something about the data in a stream. State is shorthand for saying "what is the current status of this data". Characters, for instance, have values, but also belong to groups, like digit characters, alpha characters and so on.

<mark>State transitions</mark> are changes from one state to another. Most state filters work by finding the state transitions and then performing some action. Here are some uses:

- Counting the number of words in input (counting word transitions) (`wc`)

- Printing one sentence per line (looking for a period, question or exclamation mark)

- Compressing input (turn off echo when in blank-spaces state)

Often programs will contain both process-filter and state-filter portions. For one homework this week you'll write a state filter that removes comments in C++ source code, while in Lecture you'll write a process filter which encrypts and decrypts text.