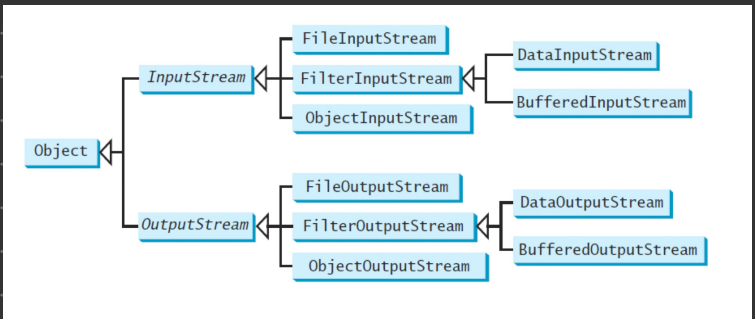
# B07 Sept 27 Lec 1 Notes

## Input and Output Streams

- Java handles input and outputs using streams




## Standard I/O

- System.in
  - Object of type InputStream
  - Refers to the keyboard.
- System.out
  - Object of type PrintStream

## File Class

- Contains methods for obtaining the properties of a file / directory and for renaming and deleting a file
- Constructing a File instance does not create a file on the machine

## File I/O

- Reading could be done using the Scanner class
  e.g. Scanner input = new Scanner(new File(filename))
- Writing could be done using the FileWriter class
  e.g. FileWriter output = new FileWriter(filename, append)

## Regular Expressions

- A regular expression (abbreviated regex) is a string that describes a pattern for matching a set of strings.
- Simple way to validate user input.
- The Pattern class can be used to define the pattern.
  - The compile method takes a string representing the reular expression.

| *Regular Expression* | *Matches* | *Example* |
|---|---|---|
| . | any single character | Java matches J..a |
| (ab\|cd) | ab or cd | ten matches t(en\|im) |
| [abc] | a, b, or c | Java matches Ja[uvwx]a |
| [^abc] | any character except a, b, or c | Java matches Ja[^ars]a |
| [a-z] | a through z | Java matches [A-M]av[a-d] |
| [^a-z] | any character except a through z | Java matches Jav[^b-d] |
| [a-e[m-p]] | a through e or m through p | Java matches [A-G[I-M]]av[a-d] |
| [a-e&&[c-p]] | intersection of a-e with c-p | Java matches [A-P&&[I-M]]av[a-d] |
| \d | a digit, same as [0-9] | Java2 matches "Java[\\d]" |
| \D | a non-digit | $Java matches "[\\D][\\D]ava" |
| \w | a word character | Java1 matches "[\\w]ava[\\w]" |
| \W | a non-word character | $Java matches "[\\W][\\w]ava" |
| \s | a whitespace character | "Java 2" matches "Java\\s2" |
| \S | a non-whitespace char | Java matches "[\\S]ava" |
| *p** | zero or more occurrences of pattern *p* | aaaabb matches "a*bb"<br>ababab matches "(ab)*" |
| *p*+ | one or more occurrences of pattern *p* | a matches "a+b*"<br>able matches "(ab)+.*" |
| *p*? | zero or one occurrence of pattern *p* | Java matches "J?Java"<br>Java matches "J?ava" |
| *p*{n} | exactly n occurrences of pattern *p* | Java matches "Ja{1}.*"<br>Java does not match ".{2}" |
| *p*{n,} | at least n occurrences of pattern *p* | aaaa matches "a{1,}"<br>a does not match "a{2,}" |
| *p*{n,m} | between n and m occurrences (inclusive) | aaaa matches "a{1,9}"<br>abb does not match "a{2,9}bb" |