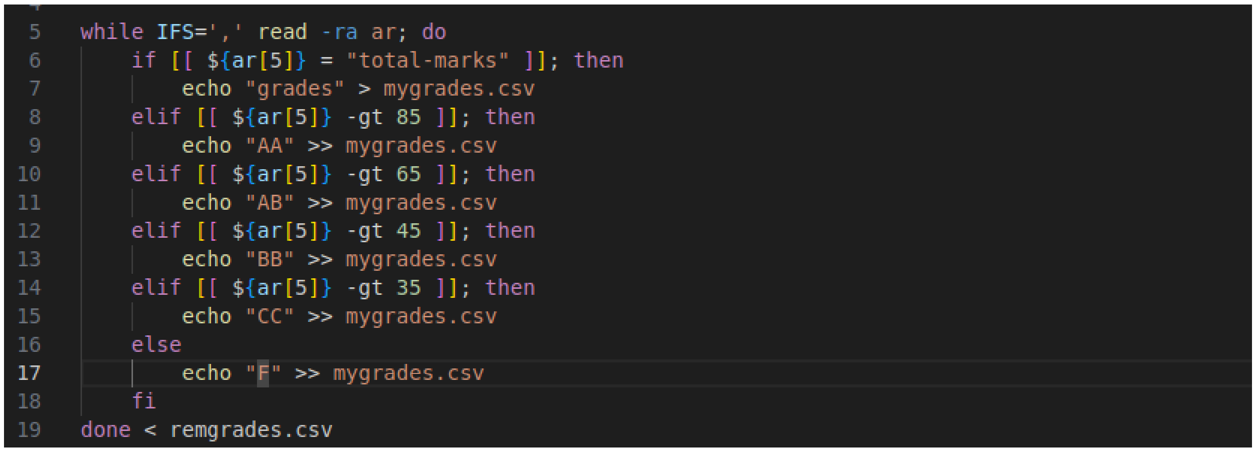
BASH

1. Dealing with a space separated file.
   If you do arr=($line) then it will convert it to array.
2. (In Bash, strings are automatically treated as integers when used in arithmetic contexts — no explicit type conversion is needed!)
3. Dealing with a csv or some other separation file in bash:



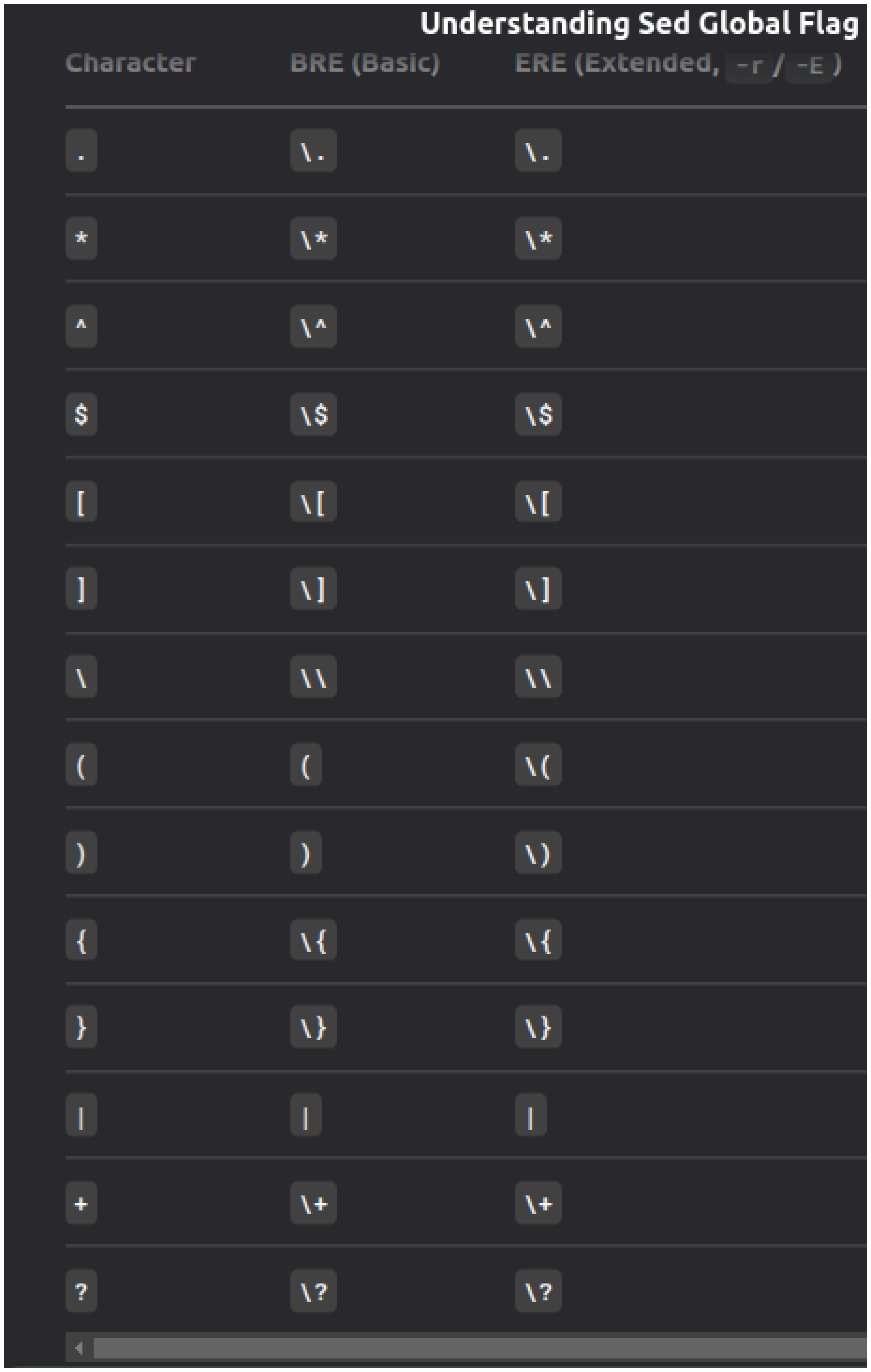
```
while IFS=',' read -ra ar; do
    if [[ ${ar[5]} = "total-marks" ]]; then
        echo "grades" > mygrades.csv
    elif [[ ${ar[5]} -gt 85 ]]; then
        echo "AA" >> mygrades.csv
    elif [[ ${ar[5]} -gt 65 ]]; then
        echo "AB" >> mygrades.csv
    elif [[ ${ar[5]} -gt 45 ]]; then
        echo "BB" >> mygrades.csv
    elif [[ ${ar[5]} -gt 35 ]]; then
        echo "CC" >> mygrades.csv
    else
        echo "F" >> mygrades.csv
    fi
done < remgrades.csv
```

4. sort -t ',' -k7 -k1,1r ug24tmp.csv >> ug24.csv

   In order to sort by multiple keys(also showing how to set reverse order)

SED

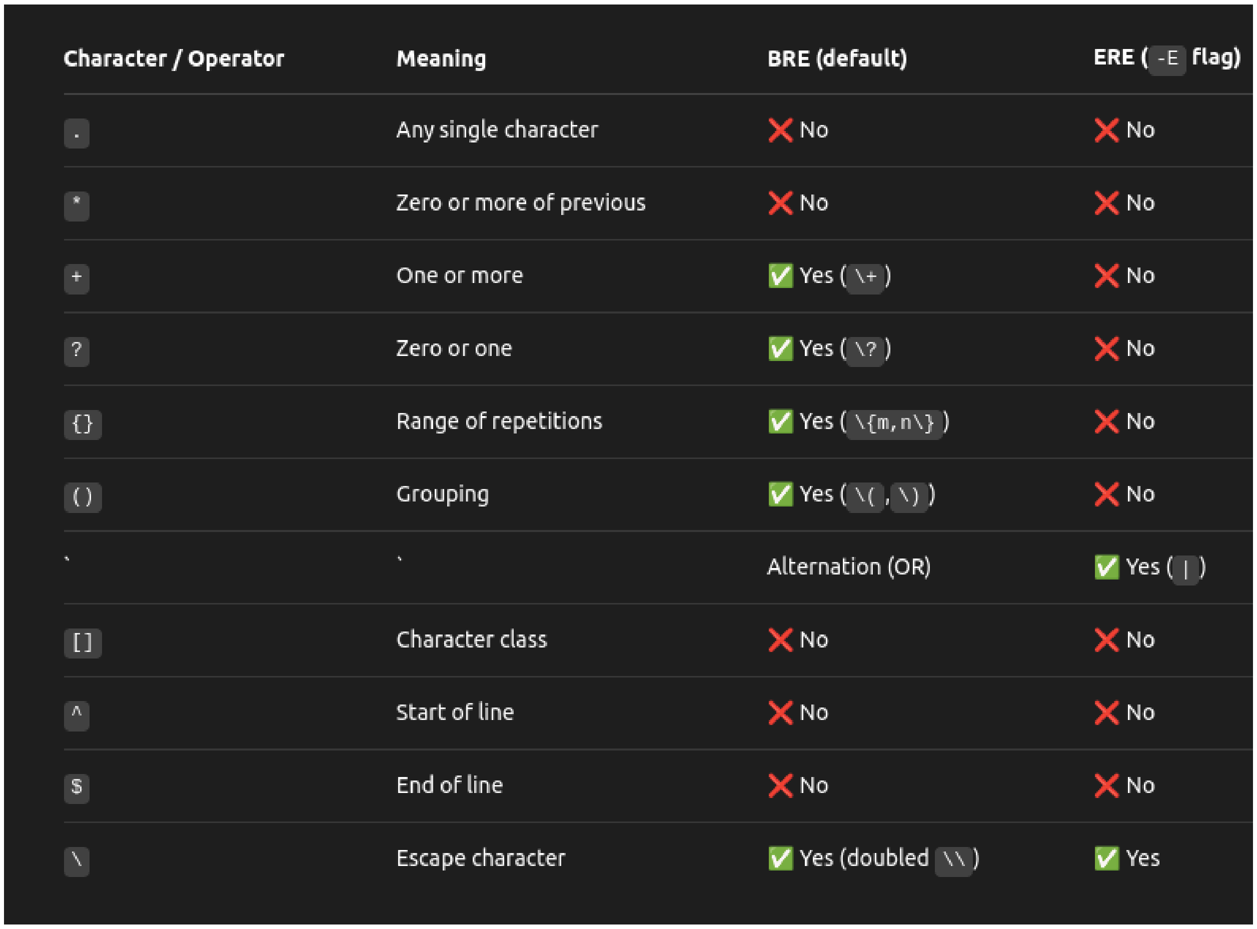
1. For seeing what you need to escape and what not, just refer to the sed official manual(download krke jaana). Open appropriate regex syntax in that usme commands appropriate escaping ke saath hi diye hai.

2. 

Understanding Sed Global Flag

Character	BRE (Basic)	ERE (Extended, `-r` / `-E`)
`.`	`\.`	`\.`
`*`	`\*`	`\*`
`^`	`\^`	`\^`
`$`	`\$`	`\$`
`[`	`\[`	`\[`
`]`	`\]`	`\]`
`\`	`\\`	`\\`
`(`	`(`	`\(`
`)`	`)`	`\)`
`{`	`\{`	`\{`
`}`	`\}`	`\}`
`|`	`|`	`|`
`+`	`\+`	`\+`
`?`	`\?`	`\?`

For treating literally



Character / Operator	Meaning	BRE (default)	ERE (`-E` flag)
`.`	Any single character	❌ No	❌ No
`*`	Zero or more of previous	❌ No	❌ No
`+`	One or more	✅ Yes (`\+`)	❌ No
`?`	Zero or one	✅ Yes (`\?`)	❌ No
`{}`	Range of repetitions	✅ Yes (`\{m,n\}`)	❌ No
`()`	Grouping	✅ Yes (`\(` , `\)`)	❌ No
`	`	Alternation (OR)	✅ Yes (`|`)
`[]`	Character class	❌ No	❌ No
`^`	Start of line	❌ No	❌ No
`$`	End of line	❌ No	❌ No
`\`	Escape character	✅ Yes (doubled `\\`)	✅ Yes

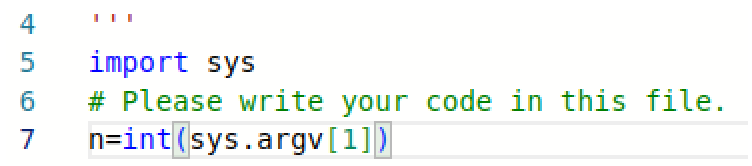
This is basic list

AWK

1. For IFS and stuff. Keep in mind that you have to write characters in double quotes only. Writing in single quotes doesn't work.

2. V.v.v.v.imp: for (key in array) is always unordered. If you want in some order DON'T USE IT. Rather use numbers. Like for (i=0; i<n; i++).
3. For string concatenation, you just have to separate the strings by space and write, no + in between.

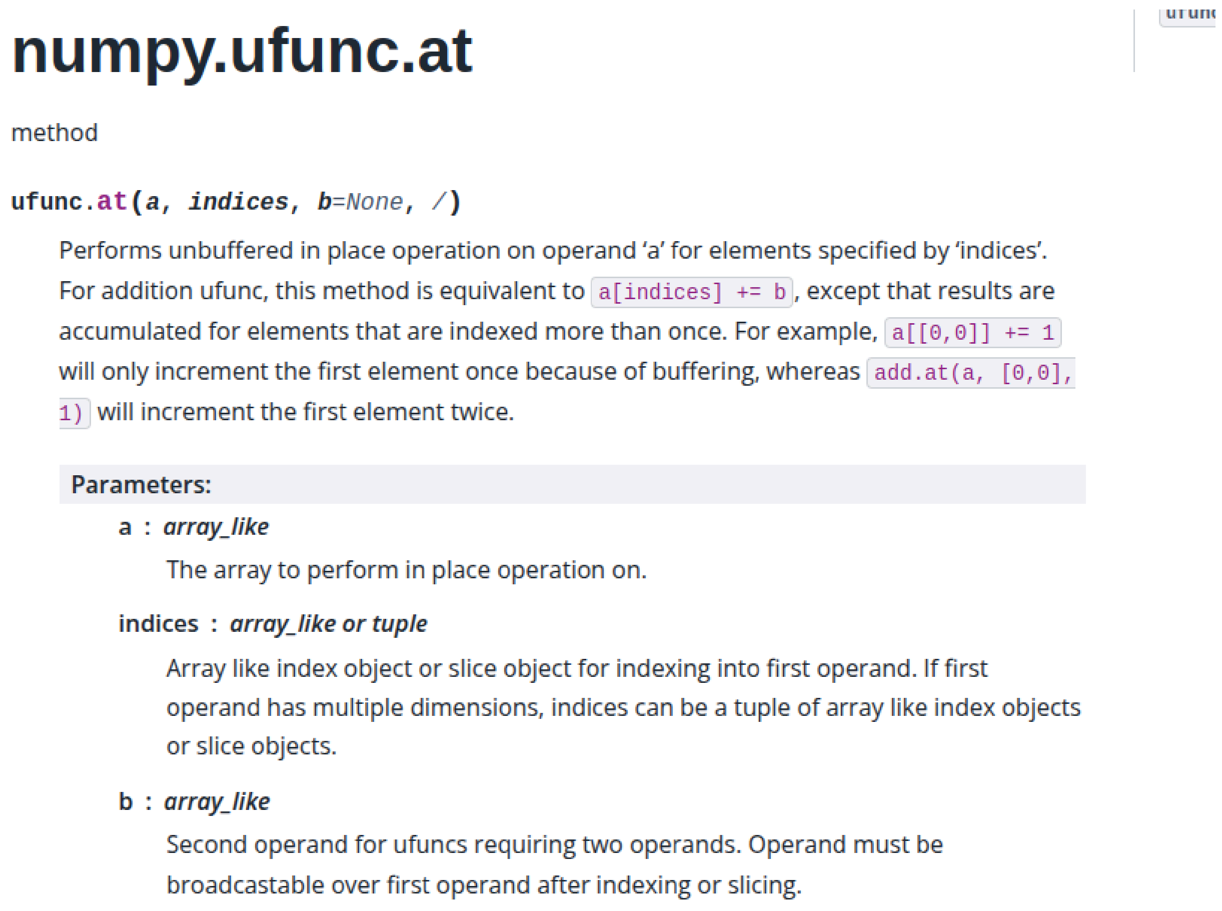
PYTHON

1. 

```
'''
import sys
# Please write your code in this file.
n=int(sys.argv[1])
```

can be used to take command line argument inputs.

2. Lots of min max functions in sorting searching section of documentation. Some in mathematical functions section too.
3. Mai bolta hu for broadcasting socho mt zyada, always align them properly and then do operations.



numpy.ufunc.at

method

`ufunc.at(a, indices, b=None, /)`

Performs unbuffered in place operation on operand 'a' for elements specified by 'indices'. For addition ufunc, this method is equivalent to `a[indices] += b`, except that results are accumulated for elements that are indexed more than once. For example, `a[[0,0]] += 1` will only increment the first element once because of buffering, whereas `add.at(a, [0,0], 1)` will increment the first element twice.

Parameters:

a : ***array_like***

The array to perform in place operation on.

indices : ***array_like or tuple***

Array like index object or slice object for indexing into first operand. If first operand has multiple dimensions, indices can be a tuple of array like index objects or slice objects.

b : ***array_like***

Second operand for ufuncs requiring two operands. Operand must be broadcastable over first operand after indexing or slicing.

4.
5. np.add.at can be really useful…See endsemques code to see how it is used. Even argmin, norm, loadtxt are nice functions.