ECE220
Honors Lab Section

Lab 8: Labs 1 – 6 Review

Lab 1: Print Binary

- Methods?
- Runtime?

- Solution:
  - Check the MSB 16 times and print ‘1’ if negative; otherwise print ‘0’

Lab 3.2: Reverse & Average

- Methods?
- Runtime?

- Solution:
  - Set aside a register R for average and zero it out
  - Check if the length of the array is odd or even
    - If odd, add middle element to R
    - Else, do nothing
  - Loop $i = 0 : n/2$
    - Reverse elements $arr[i]$ with $arr[n - i]$

Lab 4: Find Duplicate

- Methods ?
- Runtime?

- Solution:
  - Loop $i = 0 : n$
    - Hash each character
      - This can be accomplished simply doing a bit shift
    - Check if there is a hash collision

Lab 4: Find Unique

- Methods?
- Runtime?

- Solution:
  - Set $v = 0$
  - Loop $i = 0 : n$
    - $v\text{^} = arr[i]$
  - Return v

Lab 5.1: Regex Verify

- Regex string?

- Solution:
  - Name: ^[A-Z][a-z]*\\s[A-Z][a-z]*$
  - Birthday: ^(0[1-9]|1[0-2])-(0[1-9]|[1-2][0-9]|3[0-1])-([0-9]{4})$
  - Phone: ^\\([0-9]{3}\\)-[0-9]{3}-[0-9]{4}$

Lab 5.2: Find Permutation

- Methods?
- Runtime?

- Solution:
  - Loop $i = 0\ to\ p$
    - Increment count of $perm[i]$
    - Increment count of $search[i]$
  - Loop $i = 0\ to\ s\ - p$
    - Check if counts are equal
    - Subtract $search[i]$ and add $search[i + p]$

Lab 6: Count steps

- Methods?
- Runtime?

- Solution:
  - Use dynamic programming concept from Lab 7
  - $level\_arr[0:n+1] = 1$
  - Loop $i = 0:n+1$
    - if $i - \{1 \dots 3\} > 0$
      - $level\_arr[i] \mathrel{+}= level\_arr[i - \{1 \dots 3\}]$
  - Return $level\_arr[n]$