**1. Create a function that takes the width, height and character and returns a picture frame as a 2D list.**

**Examples:**  
get\_frame(4, 5, "#") ➞ [ ["####"], ["# #"], ["# #"], ["# #"], ["####"] ]  
# Frame is 4 characters wide and 5 characters tall.

get\_frame(10, 3, "\*") ➞ [ ["\*\*\*\*\*\*\*\*\*\*"], ["\* \*"], ["\*\*\*\*\*\*\*\*\*\*"] ]  
# Frame is 10 characters and wide and 3 characters tall.

get\_frame(2, 5, "0") ➞ "invalid"  
# Frame's width is not more than 2.

In [1]:

**def** get\_frame(in\_width,in\_height,in\_character):

**if** in\_width **<=** 2:

print("Invalid")

**else**:

out\_list **=** []

**for** height **in** range(in\_height):

**if** height **==** 0 **or** height **==** in\_height**-**1:

out\_list**.**append([in\_width**\***in\_character])

**else**:

out\_list**.**append([in\_character**+**' '**\***(in\_width**-**2)**+**in\_character])

**for** ele **in** out\_list:

print(ele)

print()

get\_frame(4, 5, "#")

get\_frame(10, 3, "\*")

get\_frame(2, 5, "0")

['####']

['# #']

['# #']

['# #']

['####']

['\*\*\*\*\*\*\*\*\*\*']

['\* \*']

['\*\*\*\*\*\*\*\*\*\*']

Invalid

**2. Write three functions:**

1. boolean\_and
2. boolean\_or
3. boolean\_xor

These functions should evaluate a list of True and False values, starting from the leftmost element and evaluating pairwise. **Examples:**  
boolean\_and([True, True, False, True]) ➞ False  
# [True, True, False, True] => [True, False, True] => [False, True] => False

boolean\_or([True, True, False, False]) ➞ True  
# [True, True, False, True] => [True, False, False] => [True, False] => True

boolean\_xor([True, True, False, False]) ➞ False  
# [True, True, False, False] => [False, False, False] => [False, False] => False

In [2]:

**def** boolean\_and(in\_list):

in\_list\_clone **=** in\_list**.**copy()

**while** len(in\_list) **!=** 1:

x **=** in\_list**.**pop(0)

y **=** in\_list**.**pop(0)

in\_list**.**insert(0,(x **and** y))

print(f'boolean\_and({in\_list\_clone}) ➞ {in\_list[0]}')

**def** boolean\_or(in\_list):

in\_list\_clone **=** in\_list**.**copy()

**while** len(in\_list) **!=** 1:

x **=** in\_list**.**pop(0)

y **=** in\_list**.**pop(0)

in\_list**.**insert(0,(x **or** y))

print(f'boolean\_or({in\_list\_clone}) ➞ {in\_list[0]}')

**def** boolean\_xor(in\_list):

in\_list\_clone **=** in\_list**.**copy()

**while** len(in\_list) **!=** 1:

x **=** in\_list**.**pop(0)

y **=** in\_list**.**pop(0)

in\_list**.**insert(0,(x **^** y))

print(f'boolean\_xor({in\_list\_clone}) ➞ {in\_list[0]}')

boolean\_and([**True**, **True**, **False**, **True**])

boolean\_or([**True**, **True**, **False**, **False**])

boolean\_xor([**True**, **True**, **False**, **False**])

boolean\_and([True, True, False, True]) ➞ False

boolean\_or([True, True, False, False]) ➞ True

boolean\_xor([True, True, False, False]) ➞ False

**3. Create a function that creates a box based on dimension n.**

**Examples:**  
make\_box(5) ➞ [ "#####", "# #", "# #", "# #", "#####" ]

make\_box(3) ➞ [ "###", "# #", "###" ]

make\_box(2) ➞ [ "##", "##" ]

make\_box(1) ➞ [ "#" ]

In [3]:

**def** make\_box(in\_dimension):

out\_list **=** []

**for** ele **in** range(in\_dimension):

**if** ele **==** 0 **or** ele **==** in\_dimension**-**1:

out\_list**.**append('#'**\***in\_dimension)

**else**:

out\_list**.**append('#'**+**' '**\***(in\_dimension**-**2)**+**'#')

**for** ele **in** out\_list:

print(ele)

print()

make\_box(5)

make\_box(2)

make\_box(1)

#####

# #

# #

# #

#####

##

##

#

**4. Given a common phrase, return False if any individual word in the phrase contains duplicate letters. Return True otherwise.**

**Examples:**  
no\_duplicate\_letters("Fortune favours the bold.") ➞ True  
no\_duplicate\_letters("You can lead a horse to water, but you can't make him drink.") ➞ True  
no\_duplicate\_letters("Look before you leap.") ➞ False  
# Duplicate letters in "Look" and "before".  
no\_duplicate\_letters("An apple a day keeps the doctor away.") ➞ False  
# Duplicate letters in "apple", "keeps", "doctor", and "away".

In [4]:

**def** no\_duplicate\_letters(in\_string):

out\_put **=** **None**

**for** ele **in** in\_string**.**split(' '):

**if** len(ele) **==** len(set(ele)):

out\_put **=** **True**

**else**:

out\_put **=** **False**

**break**

print(f'no\_duplicate\_letters({in\_string}) ➞ {out\_put}')

no\_duplicate\_letters("Fortune favours the bold.")

no\_duplicate\_letters("You can lead a horse to water, but you can't make him drink.")

no\_duplicate\_letters("Look before you leap.")

no\_duplicate\_letters("An apple a day keeps the doctor away.")

no\_duplicate\_letters(Fortune favours the bold.) ➞ True

no\_duplicate\_letters(You can lead a horse to water, but you can't make him drink.) ➞ True

no\_duplicate\_letters(Look before you leap.) ➞ False

no\_duplicate\_letters(An apple a day keeps the doctor away.) ➞ False

**5. Write a regular expression that will match the states that voted yes to President Trump's impeachment. You must use RegEx positive lookahead.**

**Examples:**  
txt = "Texas = no, California = yes, Florida = yes, Michigan = no"  
pattern = "yourregularexpressionhere"  
re.findall(pattern, txt) ➞ ["California", "Florida"]

In [5]:

**import** re

txt **=** "Texas = no, California = yes, Florida = yes, Michigan = no"

pattern **=** r'\w+(?=\s=\syes\*)'

match **=** re**.**findall(pattern,txt)

print(f're.findall{pattern,txt} ➞ {match}')

re.findall('\\w+(?=\\s=\\syes\*)', 'Texas = no, California = yes, Florida = yes, Michigan = no') ➞ ['California', 'Florida']