

Same Functionality	Purpose	Code
Q: 1.1	Find area of a circle	<pre>def findArea(r): PI = 3.142 return PI * (r*r); print('Area is %.6f' % findArea(5));</pre>
Q: 1.2	Find area of a circle	<pre>import math def area(r): area = math.pi* pow(r,2) return print('Area is:' ,area) area(4)</pre>
Q: 1.1 & 1.2		
Q: 2.1	Split the array and add the first part to the end	<pre>def splitArr(arr, n, k): for i in range(0, k): x = arr[0] for j in range(0, n-1): arr[j] = arr[j + 1] arr[n-1] = x arr = [12, 10, 5, 6, 52, 36] n = len(arr) position = 2 splitArr(arr, n, position) for i in range(0, n): print(arr[i], end=' ')</pre>

Q: 2.2

Split the array and
add the first part to
the end

```
from collections import deque

def splitArr(a, n, k):
    q = deque(a)
    q.rotate(-k)
    return list(q)

arr = [12, 10, 5, 6, 52, 36]
n = len(arr)
position = 2
arr = splitArr(arr, n, position)
for i in range(0, n):
    print(arr[i], end=' ')
```

Q: 2.1 & 2.2

Q: 3.1

Find remainder of
array multiplication
divided by n

```
from functools import reduce

def find_remainder(arr, n):
    sum_1 = reduce(lambda x,
y: x*y, arr)
    remainder = sum_1 % n
    print(remainder)

arr = [100, 10, 5, 25, 35, 14]
n = 11
find_remainder(arr, n)
```

Q: 3.2

Find remainder of
array multiplication
divided by n

```
arr = [100, 10, 5, 25, 35,  
14];  
lens = len(arr);n = 11  
mul = 1  
for i in range(lens):  
    mul = (mul * (arr[i] % n)) % n  
print(mul % n)
```

Q: 3.1 & 3.2

Q: 4.1

Find the most
occurring character
and its count

```
string1='geeksforgeeks'  
list1=[]  
list2=[]  
for i in string1:  
    if i not in list1:  
        list1.append(i)  
        list2.append(string1.count(i))  
occ=max(list2)  
ele=list1[list2.index(occ)]  
print(ele,occ)
```

Q: 4.2

Find the most occurring character and its count

```
string1 = 'geeksforgeeks'

count_char = lambda c:
string1.count(c)

char_counts = [(c,
count_char(c)) for c in
set(string1)]

most_common = max(char_counts,
key=lambda x: x[1])
print(most_common[0],
most_common[1])
```

Q: 4.1 & 4.2

Q: 5.1

Check if given array is Monotonic

```
def isMonotonic(A):
    x, y = [], []
    x.extend(A)
    y.extend(A)
    x.sort()
    y.sort(reverse=True)
    if(x == A or y == A):
        return True
    return False

A = [6, 5, 4, 4]
print(isMonotonic(A))
```

Q: 5.2

Check if given array is
Monotonic

```
def isMonotonic(arr):  
    if len(arr) <= 2:  
        return True  
    direction = arr[1] - arr[0]  
    for i in range(2, len(arr)):  
        if direction == 0:  
            direction = arr[i]  
                - arr[i - 1]  
            continue  
        if (direction > 0 and  
            arr[i] < arr[i - 1])  
        or (direction < 0 and  
            arr[i] > arr[i - 1]):  
            return False  
    return True
```

```
arr1 = [1, 2, 3, 4, 5]  
arr2 = [5, 4, 3, 2, 1]  
arr3 = [1, 2, 2, 3, 4]  
arr4 = [1, 2, 3, 4, 5, 4]
```

```
print(isMonotonic(arr1))  
print(isMonotonic(arr2))  
print(isMonotonic(arr3))  
print(isMonotonic(arr4))
```

Q: 5.1 & 5.2

Q: 6.1

Check if Binary
representation is
Palindrome

```
def binarypalindrome(num):  
  
    binary = bin(num)  
    binary = binary[2:]  
  
    return binary == binary[-1::-1]  
  
if __name__ == '__main__':  
    num = 9  
    print binarypalindrome(num)
```

Q: 6.2

Check if Binary
representation is
Palindrome

```
def binarypalindrome(num):  
    binary = bin(num)[2:]  
  
    left = 0  
    right = len(binary) - 1  
  
    while left < right:  
        if binary[left] !=  
            binary[right]:  
            return False  
        left += 1  
        right -= 1  
  
    return True  
  
if __name__ == '__main__':  
    num = 9  
    print(binarypalindrome(num))
```

Q: 6.1 & 6.2

Q: 7.1

Product of unique
prime factors of a
number

```
def productPrimeFactors(n):  
    product = 1  
  
    for i in range(2, n+1):  
        if (n % i == 0):  
            isPrime =  
                for j in range(2,  
                    int(i/2 + 1)):  
                    if (i % j == 0):  
                        isPrime = 0  
            break  
  
        if (isPrime):  
            product = product * i  
            return product  
  
n = 44  
print(productPrimeFactors(n))
```

Q: 7.2

**Product of unique
prime factors of a
number**

```
def productPrimeFactors(n):  
    product = 1  
  
    if (n % 2 == 0):  
        product *= 2  
        while (n%2 == 0):  
            n = n/2  
  
    for i in range (3,  
int(math.sqrt(n)), 2):  
        if (n % i == 0):  
            product = product * i  
            while (n%i == 0):  
                n = n/i  
  
    if (n > 2):  
        product = product * n  
  
    return product  
  
n = 44  
print (int(productPrimeFactors(n)))
```

Q: 7.1 & 7.2

Q: 8.1

**Break a list into
chunks of size N**

```
from collections import deque

def split_list(input_list,
               chunk_size):

    deque_obj = deque(input_list)

    while deque_obj:
        chunk = []
        for _ in range(chunk_size):
            if deque_obj:
                chunk.append(deque_obj
                             .popleft())
        yield chunk
input_list = [1, 2, 3, 4, 5,
              6, 7, 8, 9, 10]
chunk_size = 3
chunks =
list(split_list(input_list,
               chunk_size))
print(chunks)
```

Q: 8.2

**Break a list into
chunks of size N**

```
from itertools import islice

def chunk(arr_range, arr_size):
    arr_range = iter(arr_range)
    return iter(lambda:
                tuple(islice(arr_range,
                             arr_size)), ())

list(chunk(range(30), 5))
```

Q: 8.1 & 8.2

Q: 9.1

**Find Cumulative sum
of a list**

```
def Cumulative(lists):  
    cu_list = []  
    length = len(lists)  
    cu_list =  
    [sum(lists[0:x:1]) for x  
    in range(0, length+1)]  
    return cu_list[1:]  
  
lists = [10, 20, 30, 40, 50]  
print (Cumulative(lists))
```

Q: 9.2

**Find Cumulative sum
of a list**

```
list=[10,20,30,40,50]  
new_list=[]  
j=0  
for i in range(0,len(list)):  
    j+=list[i]  
    new_list.append(j)  
  
print(new_list)
```

Q: 9.1 & 9.2

Q: 10.1

**Count occurrences of
an element in a list**

```
def countX(lst, x):  
    count = 0  
    for ele in lst:  
        if (ele == x):  
            count = count + 1  
    return count  
  
lst = [8, 6, 8, 10, 8, 20, 10, 8, 8]  
x = 8  
print('{} has occurred {}  
times'.format(x,  
  
countX(lst, x))
```

Q: 10.2

Count occurrences of an element in a list

```
def countX(lst, x):  
    return lst.count(x)  
  
lst = [8, 6, 8, 10, 8, 20, 10, 8, 8]  
x = 8  
print('{} has occurred {}  
times'.format(x,  
  
countX(lst, x))
```

Q: 10.1 & 10.2

Programming Assignment	Purpose	Code
Q: 1.1 (Teacher's solution)	Find which day is the Leap year	<pre>maxdays = [31,28,31,30,31,30,31,31, 30,31,30,31] year = int(input('Year: ')) while year <= 1583 or year > 9999: print('Out of allowed range 1583 to 9999!') year = int(input('Year: ')) month = int(input('Month: ')) while month < 1 or month > 12: print('Out of allowed range 1 to 12!') month = int(input('Month: ')) day = int(input('Day: ')) while day < 1 or day > maxdays[month-1]: print('Out of allowed range 1 to', maxdays[month-1]) day = int(input('Day: ')) if month == 1 or month == 2: month += 12</pre>

Q: 1.2
(Nikolina's
solution)

Find which day is the
Leap year

```
Minimum_year = int(1583)
Maximum_year = int(9999)
Maximum_month = int(12)
Minimum_month = int(1)
Minimum_day = int(1)
Maximum_day = int(31)

year = int(input('Year: '))

ItIsLeapYear = year
if (year % 400 == 0) or ((year
% 4 == 0) and (year % 100 != 0)):
    ItIsLeapYear = True
else:
    ItIsLeapYear = False while year
< Minimum_year or
year > Maximum_year:
    print('Out of allowed
    range 1583 to 9999')
    year = int(input('Year: '))
month = int(input('Month: '))
while month < Minimum_month or
```

//Click to expand cell

```
month > Maximum month:
```

Q: 1.3
(Lisa's solution)

Find which day is the
Leap year

```
def leap(year):  
    if year % 400 == 0:  
        return True  
    if year % 100 == 0:  
        return False  
  
    if year % 4 == 0:  
        return True  
    else:  
        return False  
  
while True:  
    year = int(input("Year: "))  
    if year < 1583 or year > 9999:  
        print("Out of allowed  
        range 1583 to 9999")  
        continue  
    else:  
        break
```

//Click to expand cell

```
while True:  
    month = int(input("Month: "))
```

Q: 1.1 & 1.2

Q: 1.1 & 1.3

Question	Answer
What is the main purpose of the following code? Answer in one sentence.	"The code calculates and prints the area of a circle with radius 5."
What is the main purpose of the following code? Answer in one sentence.	"The main purpose of the following code is to calculate the area of a circle with a given radius and print the result to the console."
Do these two code snippets achieve the same thing? Please answer yes or no.	"Yes"
What is the main purpose of the following code? Answer in one sentence.	"The main purpose of the code is to split an array into two parts and move the first part to the end of the array, given a specific position."

Different Functionality
Q: 1.1
Q: 1.2
Q: 1.1 & 1.2
Q: 2.1

What is the main purpose of the following code?
Answer in one sentence.

"The main purpose of the code is to rotate an array by a given position using deque."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?
Answer in one sentence.

"The code finds the remainder of the product of all the numbers in the array after dividing it by n."

Q: 2.2

Q: 2.1 & 2.2

Q: 3.1

What is the main purpose of the following code?

Answer in one sentence.

"The code computes the product of the remainders of each element in the array when divided by 11."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?

Answer in one sentence.

The purpose of the code is to find the element with the highest frequency in the string and print it along with its frequency.

Q: 3.2

Q: 3.1 & 3.2

Q: 4.1

What is the main purpose of the following code?
Answer in one sentence.

"The main purpose of the code is to find the most frequently occurring character in a given string and how many times it occurs."

Q: 4.2

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

Q: 4.1 & 4.2

What is the main purpose of the following code?
Answer in one sentence.

"The purpose of the code is to determine if the input list A is monotonic (either strictly increasing or strictly decreasing)."

Q: 5.1

What is the main purpose of the following code?
Answer in one sentence.

"The main purpose of the code is to determine whether an array is monotonic (either entirely non-decreasing or non-increasing) or not."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?
Answer in one sentence.

"The code checks whether the binary representation of a given number is a palindrome or not."

Q: 5.2

Q: 5.1 & 5.2

Q: 6.1

What is the main purpose of the following code?
Answer in one sentence.

"The main purpose of the code is to check whether a binary number is a palindrome or not."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?
Answer in one sentence.

"The code calculates the product of the prime factors of a given number (in this case, 44) and returns the result (in this case, 22)."

Q: 6.2

Q: 6.1 & 6.2

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to calculate the product of the prime factors of a given number."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?

Answer in one sentence.

"To split a list into chunks of a specified size using a deque object and yield each chunk."

What is the main purpose of the following code?

Answer in one sentence.

"The code creates an iterator that groups items from a given range into tuples of a specified size."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to calculate the cumulative sum of a given list and return a list of these cumulative sums."

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to create a new list where each element is the sum of all previous elements in the original list."

Do these two code snippets achieve the same thing? Please answer yes or no.

What is the main purpose of the following code?

Answer in one sentence.

The main purpose of the code is to count how many times a specific element (x) appears in a list (lst) and print that count in a message.

What is the main purpose of the following code?
Answer in one sentence.

"The code counts the number of occurrences of a given variable (x=8) in a list (lst)."

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

Question	Answer
What is the main purpose of the following code? Answer in one sentence.	"The main purpose of the code is to ask for a date and then determine the day of the week for that date."

Google Hash-code
Q: 1 One pizza - Hashcode 2022 training problem.

What is the main purpose of the following code?

Answer in one sentence.

"The purpose of the code is to take user input for a date and determine the day of the week that date falls on using the Zeller's congruence algorithm."

**Q: 2 One pizza -
Hashcode 2022
training
problem.**

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to determine the day of the week for a given date and check whether the date is valid or not."

Q: 1 & 2

Do these two code snippets achieve the same thing? Please answer yes or no

"Yes"

Do these two code snippets achieve the same thing? Please answer yes or no

"Yes"

Purpose	Code
Read file word by word	<pre> with open('GFG.txt','r') as file: for line in file: for word in line.split(): print(word) </pre>
Read character by character from a file	<pre> file = open('file.txt', 'r') while 1: char = file.read(1) if not char: break print(char) file.close() </pre>

Split the array and add the first part to the end	<pre> from collections import deque def splitArr(a, n, k): q = deque(a) q.rotate(-k) return list(q) # main arr = [12, 10, 5, 6, 52, 36] n = len(arr) position = 2 arr = splitArr(arr, n, position) for i in range(0, n): </pre>
---	---

Find remainder of
array multiplication
divided by n

```
from functools import reduce

def find_remainder(arr, n):
    sum_1 = reduce(lambda x,
y: x*y, arr)
    remainder = sum_1 % n
    print(remainder)

arr = [100, 10, 5, 25, 35, 14]
n = 11
find_remainder(arr, n)
```

Copy odd lines of one
file to other

```
fn = open('bcd.txt', 'r')

fn1 = open('nfile.txt', 'w')

cont = fn.readlines()
type(cont)
for i in range(0, len(cont)):
    if(i % 2 != 0):
        fn1.write(cont[i])
    else:
        pass

fn1.close()

fn1 = open('nfile.txt', 'r')

cont1 = fn1.read()

print(cont1)

fn.close()
fn1.close()
```

Merge two files into
a third file

```
filenames = ['file1.txt',  
             'file2.txt']  
  
with open('file3.txt', 'w') as  
    outfile:  
  
    for names in filenames:  
  
        with open(names) as  
            infile:  
  
            outfile.write(infile.read())  
  
            outfile.write('\n')
```

Insertion sort

```
def insertionSort(arr):  
  
    if (n := len(arr)) <= 1:  
        return  
    for i in range(1, n):  
  
        key = arr[i]  
  
        j = i-1  
        while j >=0 and key <  
            arr[j] :  
                arr[j+1] =  
arr[j]  
                j -= 1  
            arr[j+1] = key  
  
arr = [12, 11, 13, 5, 6]  
insertionSort(arr)  
print(arr)  
  
else:  
    print('Element is not  
        present in array')
```

Quick Sort

```
def partition(array, low,
high):
    pivot = array[high]

    i = low - 1

    for j in range(low, high):
        if array[j] <= pivot:
            i = i + 1

            (array[i],array[j]) =
(array[j],array[i])

    (array[i + 1], array[high]) =
(array[high], array[i + 1])
    return i + 1

def quickSort(array, low,
high):
    if low < high:
```

//Click to expand cell

```
pi = partition(array, low,
high)
```

Print odd numbers in
a list

```
list1 = [10, 21, 4, 45, 66,
93]
i = 0

while(i < len(list1)):

    if list1[i] % 2 != 0:
        print(list1[i], end='
')

    i += 1
```

Print odd numbers in `start, end = 4, 19`

a range

```
for num in range(start, end +
1):

    if num % 2 != 0:
        print(num, end = ' ')
```

Find largest number
in a list

```
def maxelement(lst):

    print(max(lst))

    lst = [20, 10, 20, 4, 100]

    maxelement(lst)
```

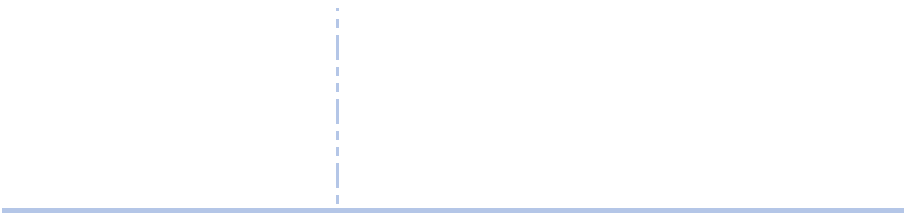
Find second largest
number in a list

```
list1 = [10, 20, 4, 45, 99]

new_list = set(list1)

new_list.remove(max(new_list))

print(max(new_list))
```



Purpose	Code
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[Link to code Q: 1 on GitHub](#)

[Link to code Q: 2](#)

Question	Answer
What is the main purpose of the following code? Answer in one sentence.	"The code reads the contents of a file called 'GFG.txt' and prints each individual word in the file."
What is the main purpose of the following code? Answer in one sentence.	"To read and print the contents of a file character by character."
Do these two code snippets achieve the same thing? Please answer yes or no.	"Yes"
What is the main purpose of the following code? Answer in one sentence.	"The code rotates an array by a given position using deque and returns the rotated array."

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to calculate the remainder of the product of the numbers in an array divided by a given number."

Do these two code snippets achieve the same thing? Please answer yes or no.

"No"

What is the main purpose of the following code?

Answer in one sentence.

"The code reads the contents of bcd.txt, removes every other line, and then saves the remaining lines to nfile.txt, which is then printed to the console."

What is the main purpose of the following code?

Answer in one sentence.

"The code opens two files, reads their contents and writes them to a third file, separating them by a new line character."

Do these two code snippets achieve the same thing? Please answer yes or no.

"No"

What is the main purpose of the following code?

Answer in one sentence.

"The code performs an insertion sort on an array."

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to implement the quicksort algorithm to sort an array of numbers in ascending order."

Do these two code snippets achieve the same thing? Please answer yes or no.

"No"

What is the main purpose of the following code?

Answer in one sentence.

"The main purpose of the code is to print all the odd numbers from the list"

What is the main purpose of the following code?

Answer in one sentence.

"To print all odd numbers between 4 and 19 (inclusive) on the same line separated by a space"

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

What is the main purpose of the following code?

Answer in one sentence.

The main purpose of the code is to find and print the maximum element in the given list.

What is the main purpose of the following code?

Answer in one sentence.

To find the second highest number in a list.

Do these two code snippets achieve the same thing? Please answer yes or no.

"Yes"

Question	Answer
What is the main purpose of the following code? Answer in one sentence.	The main purpose of the code is to read input data containing client preferences for pizza ingredients, maximize the number of satisfied clients by choosing ingredients for a pizza, and write the chosen ingredients to an output file.

What is the main purpose of the following code?

Answer in one sentence.

The main purpose of the code is to implement a genetic algorithm to solve a pizza optimization problem for customers with specific likes and dislikes.

Do these two code snippets achieve the same thing? Please answer yes or no

No. The first code snippet uses a different approach to solve the problem, while the second snippet uses a genetic algorithm implementation from pygad library.

