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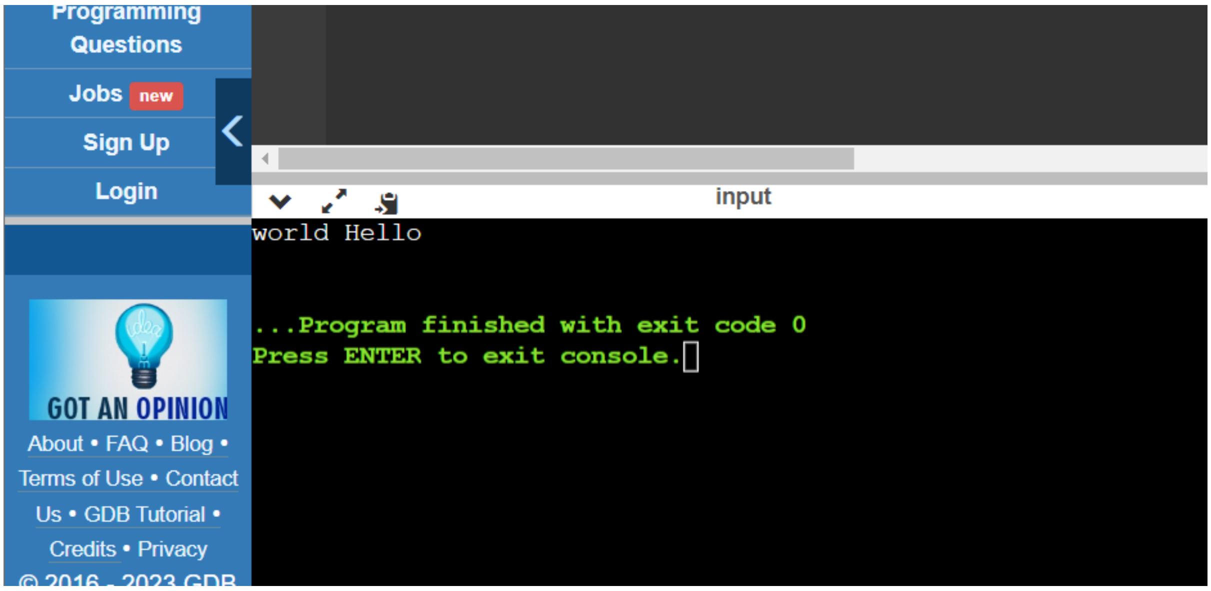
Day-15:String-1

Problem Statement: Given a string s, reverse the words of the string.

```
def reverse_words(s):

    words = s.split(' ')

    reversed_words = words[::-1]

    reversed_string = ' '.join(reversed_words)

    return reversed_string

string = "Hello world"

reversed_string = reverse_words(string)

print(reversed_string)
```



```
world Hello


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Press ENTER to exit console.
```
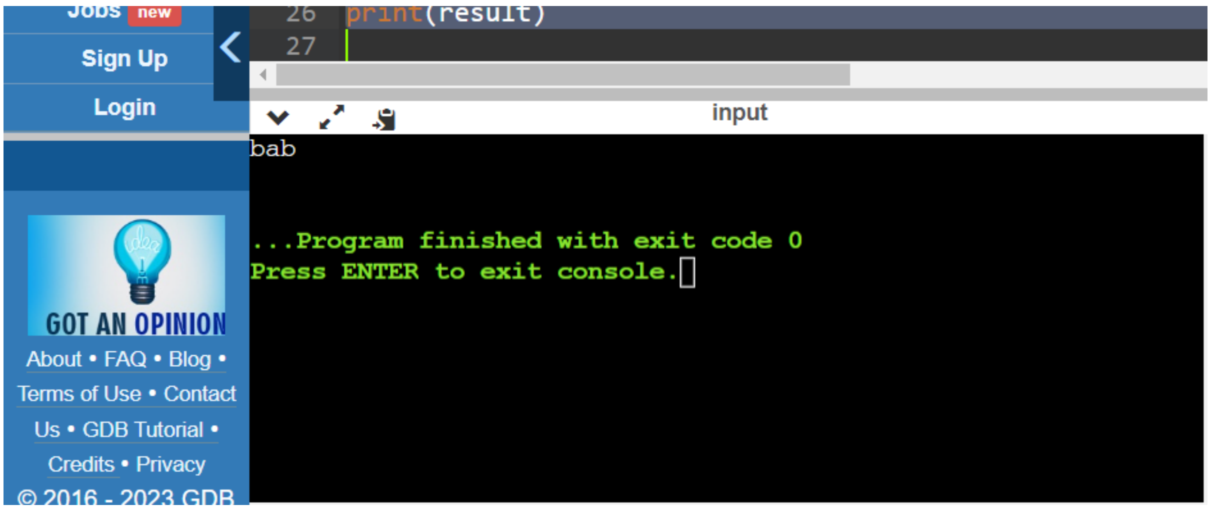

Problem Statement: Longest Palindromic Substring

```
def expandAroundCenter(s, left, right):

    while left >= 0 and right < len(s) and s[left] == s[right]:

        left -= 1

        right += 1

    return right - left - 1


def longestPalindrome(s):
    start = 0
    maxLen = 0

    for i in range(len(s)):
        len1 = expandAroundCenter(s, i, i)
        len2 = expandAroundCenter(s, i, i + 1)

        if len1 > maxLen:
            maxLen = len1
            start = i - (len1 - 1) // 2

        if len2 > maxLen:
            maxLen = len2
            start = i - len2 // 2 + 1

    return s[start:start + maxLen]
s = "babad"
result = longestPalindrome(s)
print(result)
```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input

```
print(result)
```

```
bab


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```
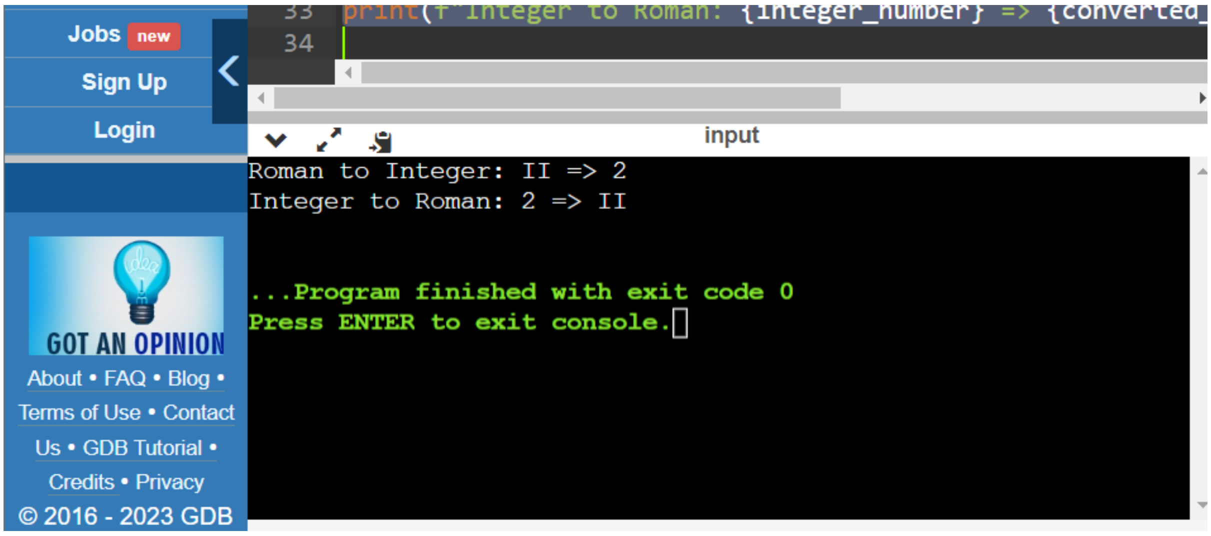

Problem Statement: Roman Number to Integer and vice versa

```
def roman_to_integer(roman):
    roman_dict = {'I': 1, 'V': 5, 'X': 10, 'L': 50, 'C': 100, 'D': 500, 'M': 1000}
    result = 0
    prev_value = 0

    for char in reversed(roman):
        value = roman_dict[char]
        if value >= prev_value:
            result += value
        else:
            result -= value
        prev_value = value
    return result

def integer_to_roman(num):
    integer_dict = {1000: 'M', 900: 'CM', 500: 'D', 400: 'CD', 100: 'C', 90: 'XC', 50: 'L', 40: 'XL',
                    10: 'X', 9: 'IX', 5: 'V', 4: 'IV', 1: 'I'}
    result = ""

    for value, symbol in integer_dict.items():
        while num >= value:
            result += symbol
            num -= value
    return result

roman_number = "II"
integer_number = 2

converted_integer = roman_to_integer(roman_number)
converted_roman = integer_to_roman(integer_number)

print(f"Roman to Integer: {roman_number} => {converted_integer}")
```

print(f"Integer to Roman: {integer_number} => {converted_roman}")



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input

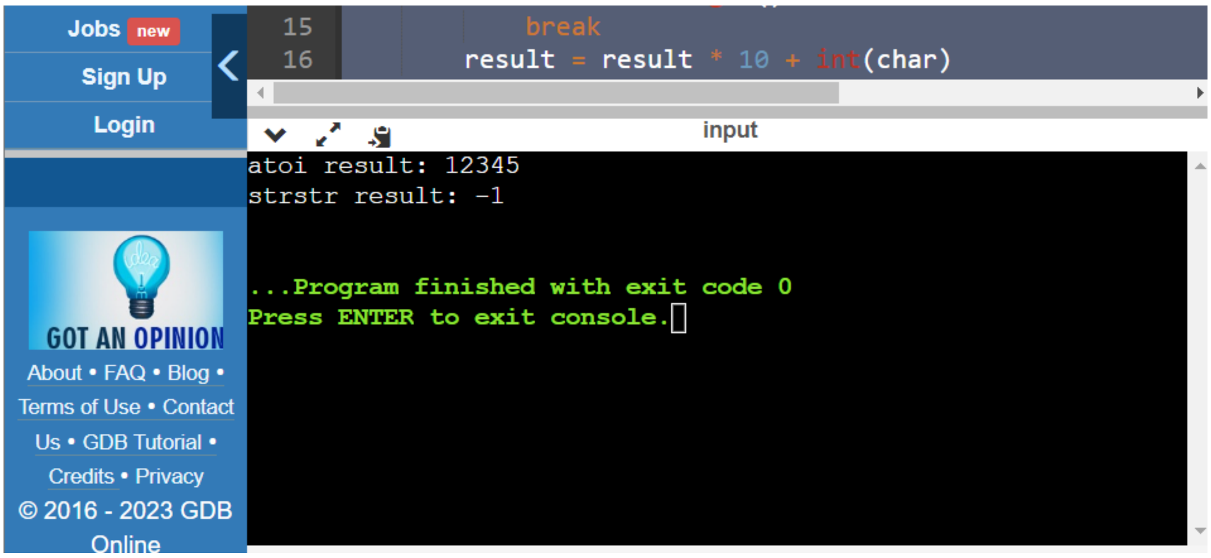
```
print(f"Integer to Roman: {integer_number} => {converted_
```

```
Roman to Integer: II => 2
Integer to Roman: 2 => II


...Program finished with exit code 0
Press ENTER to exit console.
```

Problem Statement: Implement ATOI/STRSTR

```
def atoi(s):
    s = s.strip()


    if not s:
        return 0


    sign = -1 if s[0] == '-' else 1


    if s[0] in ('-', '+'):
        s = s[1:]


    result = 0
    for char in s:
        if not char.isdigit():
            break
        result = result * 10 + int(char)

    return sign * result

def strstr(haystack, needle):
    if not needle:
        return 0

    for i in range(len(haystack) - len(needle) + 1):
        j = 0
        while j < len(needle) and haystack[i+j] == needle[j]:
            j += 1
        if j == len(needle):
            return i

    return -1

str1 = "12345"
str2 = "567"
result1 = atoi(str1)
result2 = strstr(str1, str2)
```

```
print("atoi result:", result1)

print("strstr result:", result2)
```



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input

```
            break
        result = result * 10 + int(char)
```

```
atoi result: 12345
strstr result: -1


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Press ENTER to exit console.
```
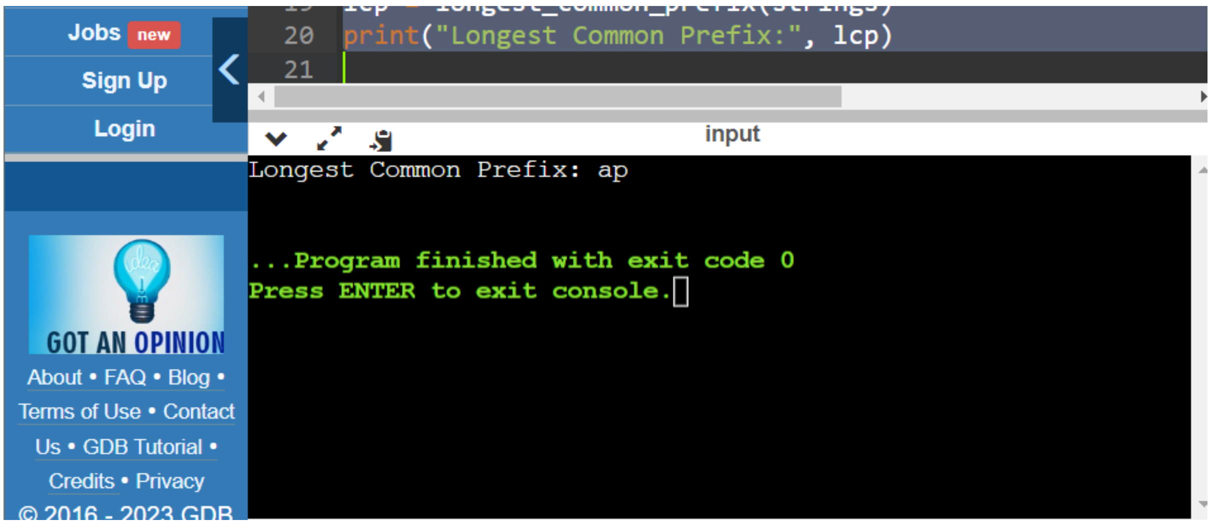

Problem Statement: Longest Common Prefix

```
def longest_common_prefix(strs):

  if not strs:

    return ""

  min_len = min(len(s) for s in strs)

  low, high = 0, min_len - 1



  while low <= high:

    mid = (low + high) // 2

    prefix = strs[0][:mid + 1]



    if all(s.startswith(prefix) for s in strs):

      low = mid + 1
```

```
        else:
            high = mid - 1

    return strs[0][:high + 1]

strings = ["apple", "ape", "april"]
lcp = longest_common_prefix(strings)
print("Longest Common Prefix:", lcp)
```



```
print("Longest Common Prefix:", lcp)
```

```
Longest Common Prefix: ap


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```
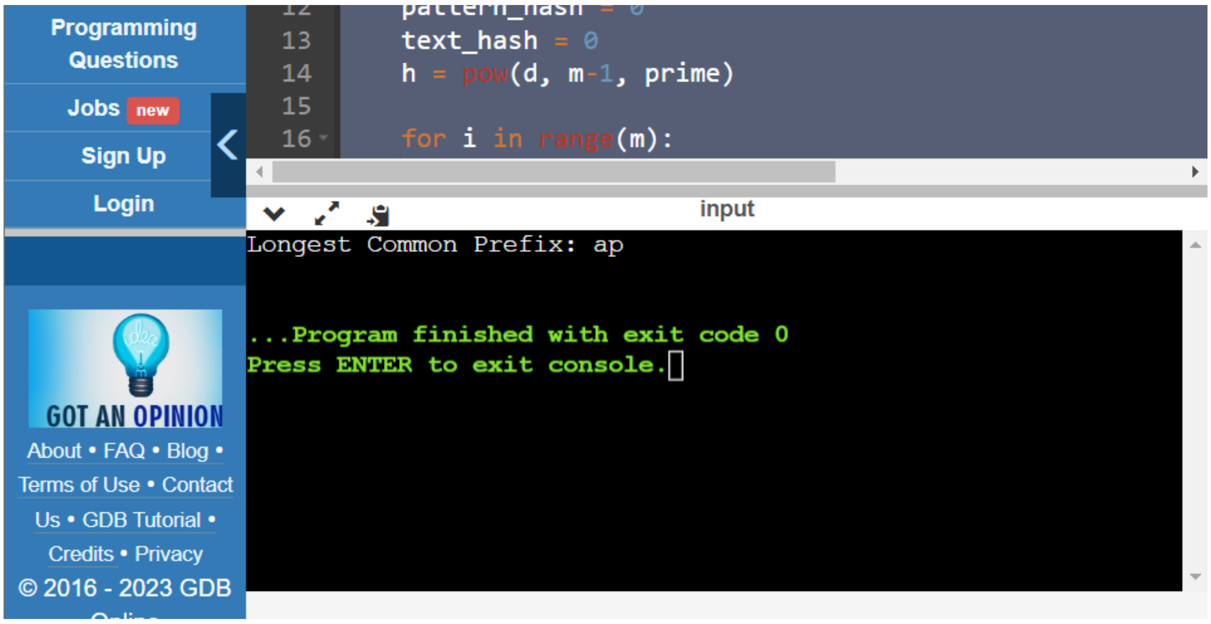

Problem Statement : Rabin karp

```
def rabin_karp(text, pattern):
    indices = []
    if not text or not pattern or len(pattern) > len(text):
        return indices

    prime = 101
```

```
d = 256

n = len(text)
m = len(pattern)

pattern_hash = 0
text_hash = 0
h = pow(d, m-1, prime)

for i in range(m):
    pattern_hash = (d * pattern_hash + ord(pattern[i])) % prime
    text_hash = (d * text_hash + ord(text[i])) % prime

for i in range(n - m + 1):
    if pattern_hash == text_hash:
        match = True
        for j in range(m):
            if text[i+j] != pattern[j]:
                match = False
                break
        if match:
            indices.append(i)
        if i < n - m:
            text_hash = (d * (text_hash - ord(text[i]) * h) + ord(text[i + m])) % prime
            if text_hash < 0:
                text_hash += prime

    return indices

text = "ABABDABACDABABCABAB"
pattern = "ABABCABAB"
result = rabin_karp(text, pattern)
print("Pattern found at indices:", result)
```



```
    pattern_hash = 0
    text_hash = 0
    h = pow(d, m-1, prime)

    for i in range(m):
```

```
Longest Common Prefix: ap


...Program finished with exit code 0
Press ENTER to exit console.
```