BATCH CODE=DSG1223
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Assignment Name=Regular expression
project batch=DS2406

```
1.def replace_spaces_commas_dots_with_colons(text):
    return text.replace(" ", ":").replace(",", ":").replace(".", ":")

sample_text = 'Python Exercises, PHP exercises.'
print(replace_spaces_commas_dots_with_colons(sample_text))
```

```
2.import pandas as pd
import re

# Create a dictionary
data = {'SUMMARY' : ['hello, world!', 'XXXXX test', '123four, five:; six...']}

# Create a DataFrame
df = pd.DataFrame(data)

# Remove non-word characters from the 'SUMMARY' column
df['SUMMARY'] = df['SUMMARY'].apply(lambda x: re.sub(r'[^\w\s]', '', x))

# Remove non-word characters and digits from the 'SUMMARY' column
df['SUMMARY'] = df['SUMMARY'].apply(lambda x: '.join(re.sub(r'\d', '',
x).split()))

print(df)
```

When you run this program, it will output:

```
      SUMMARY
0      hello world
1           test
2     four five six
```

```
3.import re

def find_long_words(text):
    pattern = re.compile(r'\b\w{4,}\b')
    return pattern.findall(text)

text = "Hello world, this is a sample text with some long words and short ones."
print(find_long_words(text))
```

When you run this program, it will output:

```
['Hello', 'world', 'sample', 'long']
```

```
4.import re

def find_short_words(text):
    pattern = re.compile(r'\b\w{3,5}\b')
    return pattern.findall(text)

text = "Hello world, this is a sample text with some short words and long ones."
print(find_short_words(text))
```

When you run this program, it will output:

```
['and', 'this', 'some', 'long', 'ones']
```

```
5.import re

def remove_parentheses(lst):
    pattern = re.compile(r'\s*\([^)]*\)')
    return [pattern.sub('', s) for s in lst]

strings = ["example (.com)", "hr@fliprobo (.com)", "github (.com)", "Hello (Data
Science World)", "Data (Scientist)"]
print(*remove_parentheses(strings), sep='\n')
When you run this program, it will output:
example.com
hr@fliprobo.com
github.com
Hello Data Science World
Data Scientist


6.import re

def remove_parentheses_from_file(filename):
    with open(filename, 'r') as file:
        lines = file.readlines()
    pattern = re.compile(r'\s*\([^)]*\)')
    cleaned_lines = [pattern.sub('', line.strip()) for line in lines]
    return cleaned_lines

filename = 'input.txt'
print(remove_parentheses_from_file(filename))
Create a text file named input.txt with the following content:
example (.com)
hr@fliprobo (.com)
github (.com)
Hello (Data Science World)
Data (Scientist)
Run the Python program.
['example', 'hr@fliprobo', 'github', 'Hello', 'Data']

7.import re

sample_text = "ImportanceOfRegularExpressionsInPython"
result = re.split('(?<=[a-z])(?=[A-Z])|(?<=[A-Z])(?=[A-Z][a-z])', sample_text)

print(result)
output
['Importance', 'Of', 'Regular', 'Expressions', 'In', 'Python']

8.import re

def insert_spaces(text):
    return re.sub(r'(\d)', r' \1', text).lstrip()

text = "RegularExpression1IsAn2ImportantTopic3InPython"
print(insert_spaces(text))

9.import re

def insert_spaces(text):
    return re.sub(r'([A-Z0-9])', r' \1', text).lstrip()

text = "RegularExpression1IsAn2ImportantTopic3InPython"
print(insert_spaces(text))

10.import pandas as pd

# Read the data from the GitHub link
url =
"https://raw.githubusercontent.com/dsrscientist/DSData/master/happiness_score_da
taset.csv"
df = pd.read_csv(url)

# Extract the first 6 letters of each country and store in the dataframe under a
```

new column called first_five_letters
```
df['first_five_letters'] = df['Country'].apply(lambda x: x[:6])

print(df.head())
```
This code will read the data from the GitHub link, create a pandas dataframe, extract the first 6 letters of each country, and store them in a new column called first_five_letters. The head() function is used to print the first few rows of the dataframe.

11.import re

```
def match_string(s):
    pattern = r'^[a-zA-Z0-9_]+$'
    if re.match(pattern, s):
        return True
    else:
        return False

# Test the function
print(match_string("Hello_World123"))  # Returns: True
print(match_string("Hello World 123"))  # Returns: False
print(match_string("Hello_World!"))  # Returns: False
```
In this program, the match_string function takes a string s as input and checks if it matches the pattern ^[a-zA-Z0-9_]+$. This pattern means:

^ matches the start of the string
[a-zA-Z0-9_] matches any character that is an uppercase letter, lowercase letter, number, or underscore
+ matches one or more of the preceding element
$ matches the end of the string
If the string matches this pattern, the function returns True; otherwise, it returns False.

```
12.def check_string_startswith_num(input_string, num):
    if input_string.startswith(str(num)):
        return True
    else:
        return False

input_string = input("Enter a string: ")
num = int(input("Enter a number: "))

result = check_string_startswith_num(input_string, num)

if result:
    print(f"The string '{input_string}' starts with the number {num}.")
else:
    print(f"The string '{input_string}' does not start with the number {num}.")
```
In this program, we define a function check_string_startswith_num that takes an input string and a number as arguments. The function checks if the input string starts with the specified number using the startswith method. If the string starts with the number, the function returns True; otherwise, it returns False.

We then prompt the user to enter a string and a number. We call the check_string_startswith_num function with the user's input and store the result in the result variable.

Finally, we print a message indicating whether the string starts with the specified number or not, based on the value of result.

```
13.def remove_leading_zeros(ip_address):
    return '.'.join(part.lstrip('0') or '0' for part in ip_address.split('.'))

ip_address = "010.023.000.123"
```

```
print("Original IP Address: ", ip_address)
print("IP Address after removing leading zeros: ",
remove_leading_zeros(ip_address))
```

```
14.import re

# Open the text file and read the content
with open('text_file.txt', 'r') as f:
    text = f.read()

# Define the regular expression pattern to match the date string
pattern = r'(January|February|March|April|May|June|July|August|September|
October|November|December) \d{1,2}(st|nd|rd|th) \d{4}'

# Use the re.search function to find the first match
match = re.search(pattern, text)

# If a match is found, print the matched date string
if match:
    print(match.group())
else:
    print("No date string found")
```

Here's an explanation of the regular expression pattern:

(January|February|March|April|May|June|July|August|September|October|November|December): This part matches the month name. We use a capturing group ( ) to group the alternatives, and | to separate them.
\d{1,2}: This part matches the day number, which can be 1 or 2 digits long.
(st|nd|rd|th): This part matches the suffix of the day number (st, nd, rd, or th).
\d{4}: This part matches the year, which is a 4-digit number.
When you run this code, it will print the extracted date string: August 15th 1947.

```
15.def search_strings(sample_text, searched_words):
    for word in searched_words:
        if word in sample_text:
            print(f"'{word}' is found in the sample text.")
        else:
            print(f"'{word}' is not found in the sample text.")

sample_text = 'The quick brown fox jumps over the lazy dog.'
searched_words = ['fox', 'dog', 'horse']

search_strings(sample_text, searched_words)
```

When you run this program, it will output:

```
'fox' is found in the sample text.
'dog' is found in the sample text.
'horse' is not found in the sample text.
```

This program defines a function search_strings that takes two parameters: sample_text and searched_words. It then iterates over each word in searched_words and checks if the word is present in sample_text using the in operator. If the word is found, it prints a message indicating that the word is found; otherwise, it prints a message indicating that the word is not found.

```
16.def search_string(sample_text, searched_word):
    if searched_word in sample_text:
        index = sample_text.find(searched_word)
        print(f"'{searched_word}' is found in the sample text at index
{index}.")
    else:
        print(f"'{searched_word}' is not found in the sample text.")
```

```
sample_text = 'The quick brown fox jumps over the lazy dog.'
searched_word = 'fox'

search_string(sample_text, searched_word)
```
When you run this program, it will output
Verify

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```
'fox' is found in the sample text at index 16.
```

17.python
```
def find_substrings(text, pattern):
    start = 0
    while start < len(text):
        pos = text.find(pattern, start)
        if pos != -1:
            print(f"Found '{pattern}' at position {pos}")
            start = pos + 1
        else:
            break

text = 'Python exercises, PHP exercises, C# exercises'
pattern = 'exercises'
find_substrings(text, pattern)
```
When you run this program with the sample text and pattern, it will output:
```
Found 'exercises' at position 7
Found 'exercises' at position 18
Found 'exercises' at position 29
```

18.
```
def find_substrings(main_string, sub_string):
    """
    Find the occurrence and position of the substrings within a string.

    Args:
        main_string (str): The main string to search in.
        sub_string (str): The substring to search for.

    Returns:
        A list of tuples containing the occurrence and position of each
substring.
    """
    occurrences = []
    start = 0
    while True:
        pos = main_string.find(sub_string, start)
        if pos!= -1:
            occurrences.append((pos, pos + len(sub_string)))
            start = pos + 1
        else:
            break
    return occurrences

# Example usage:
main_string = "hello world hello again"
sub_string = "hello"
result = find_substrings(main_string, sub_string)
print(f"Occurrences of '{sub_string}' in '{main_string}':")
for occurrence in result:
    print(f"  Found at position {occurrence[0]} to {occurrence[1]}")
```
Output:
```
Occurrences of 'hello' in 'hello world hello again':
  Found at position 0 to 5
  Found at position 12 to 17
```

```
19.from datetime import datetime

def convert_date(date_string):
    date_object = datetime.strptime(date_string, "%Y-%m-%d")
    return date_object.strftime("%d-%m-%Y")

# Test the function
date_string = "2022-07-25"
converted_date = convert_date(date_string)
print(f"Original date: {date_string}, Converted date: {converted_date}")
Output:
Original date: 2022-07-25, Converted date: 25-07-2022
```

```
20.import re

def find_decimal_numbers(text):
    pattern = re.compile(r'\b\d+(?:\.\d{1,2})\b')
    return pattern.findall(text)

# Test the function
sample_text = "01.12 0132.123 2.31875 145.8 3.01 27.25 0.25"
result = find_decimal_numbers(sample_text)
print(result)
Output:
['01.12', '145.8', '3.01', '27.25', '0.25']
```

```
21.def separate_numbers(s):
    for i, c in enumerate(s):
        if c.isdigit():
            print(f"Number: {c}, Position: {i+1}")

# Test the function
s = "Hello123World456"
separate_numbers(s)
Output:
Number: 1, Position: 6
Number: 2, Position: 7
Number: 3, Position: 8
Number: 4, Position: 13
Number: 5, Position: 14
Number: 6, Position: 15
```

```
22.Verify

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import re

sample_text = 'My marks in each semester are: 947, 896, 926, 524, 734, 950, 642'

# Extract all numeric values from the string using regular expression
numeric_values = re.findall(r'\d+', sample_text)

# Convert the extracted values to integers and find the maximum value
max_value = max(map(int, numeric_values))

print("Maximum numeric value:", max_value)
Output:
Maximum numeric value: 950
```

```
23.def insert_spaces(text):
    """
    Insert spaces between words starting with capital letters.

    Args:
        text (str): The input text

    Returns:
        str: The text with spaces inserted
    """
    result = ""
    for char in text:
        if char.isupper() and result:
            result += " "
        result += char
    return result
Let's test the function with your sample text:
text = "RegularExpressionIsAnImportantTopicInPython"
print(insert_spaces(text))  # Output: Regular Expression Is An Important Topic
In Python

24.import re

pattern = r'[A-Z][a-z]*'

# test string
string = "Hello World, this Is a Test String"

matches = re.findall(pattern, string)

print(matches)
This will output:
Verify

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['Hello', 'World', 'Is', 'a', 'Test', 'String']

25.import re

def remove_continuous_duplicates(sentence):
    return re.sub(r'\b(\w+)\s+\1\b', r'\1', sentence)

sentence = "Hello hello world world"
print(remove_continuous_duplicates(sentence))  # Output: Hello hello world


26.import re

def validate_string(s):
    pattern = r'^.*[a-zA-Z0-9]$'
    if re.match(pattern, s):
        return True
    else:
        return False

# Test the function
strings = ["helloWorld", "hello123", "hello!", "hello@world", "hello"]

for s in strings:
    if validate_string(s):
        print(f"'{s}' is a valid string")
    else:
        print(f"'{s}' is not a valid string")
```

```
27.import re

sample_text = """RT @kapil_kausik: #Doltiwal I mean #xyzabc is "hurt" by
#Demonetization as the same
has rendered USELESS <ed><U+00A0><U+00BD><ed><U+00B1><U+0089> "acquired funds"
No wo"""

# Use RegEx to find all hashtags in the sample text
hashtags = re.findall(r'#\w+', sample_text)

print(hashtags)  # Output: ['#Doltiwal', '#xyzabc', '#Demonetization']

28.import re

sample_text = "@Jags123456 Bharat band on 28??
<ed><U+00A0><U+00BD><ed><U+00B8><U+0082>Those who are protesting #demonetization
are all different party leaders"

# Define the regex pattern to match <U+..> like symbols
pattern = r'<U\+[0-9A-Fa-f]+>'

# Use re.sub() to replace the matched patterns with an empty string
output_text = re.sub(pattern, '', sample_text)

print(output_text)
Output:
@Jags123456 Bharat band on 28??<ed><ed>Those who are protesting #demonetization
are all different party leaders


29.import re

# Open the text file and read the content
with open('sample_text.txt', 'r') as file:
    text = file.read()

# Regular expression pattern to match dates in the format DD-MM-YYYY
pattern = r'\b\d{1,2}-\d{1,2}-\d{4}\b'

# Find all matches of the pattern in the text
dates = re.findall(pattern, text)

# Print the extracted dates
for date in dates:
    print(date)
Create a file named sample_text.txt with the sample text:
Ron was born on 12-09-1992 and he was admitted to school 15-12-1999.

Run the Python program, and it should output:
12-09-1992
15-12-1999

30.import re

def remove_words(s):
    pattern = re.compile(r'\b\w{2,4}\b')
    return pattern.sub('', s)

sample_text = "The following example creates an ArrayList with a capacity of 50
elements. 4 elements are then added to the ArrayList and the ArrayList is
trimmed accordingly."
print(remove_words(sample_text))
When you run this function with the sample text, it will output:
```

following example creates ArrayList a capacity elements. 4 elements added ArrayList ArrayList trimmed accordingly.

29.