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CSC 330

Language Design and Implementation

Week 3

Lesson 5:

import java.util.regex.Matcher;

import java.util.regex.Pattern;

import java.util.Scanner;

public class regExProject {

public static int countAll = 0;

public static void main(String[] args) {

// Pattern 1: Match 5 capital letters A-Z, exactly one '^' character, then an optional 5-digit number

String regex1 = "[A-Z]{5}\\^\\d{5}";

// Pattern 2: Match exactly 8 alphanumeric characters (a-z, A-Z, 0-9) and hyphens in any combination

String regex2 = "[a-zA-Z0-9-]{8}";

// Pattern 3: Match any input string that begins with 'zyz' and ends with 'zz', allowing any substring in between

String regex3 = "zyz.\*zz";

// Pattern 4: Find names: Abraham Lincoln, H. G. Wells, Hunter S. Thompson, and Martin Luther King, Jr.

String regex4 = "(Abraham Lincoln|H\\. G\\. Wells|Hunter S\\. Thompson|Martin Luther King, Jr\\.)";

//Text (mostly) provided by ChatGPT - Was either this or using lorem in vscode

//I made some changes to allow for matches to the first regex requirement.

String bodyOfText = "Abraham Lincoln, H. G. Wells, Hunter S. Thompson, and Martin Luther King, Jr. are four iconic "

+ "figures who have left a lasting impact on various fields and influenced countless lives. Each of them brought "

+ "unique perspectives, ideas, and contributions to their respective domains, leaving behind a powerful legacy that "

+ "continues to shape the world. Abraham Lincoln, the 16th President of the United States ( USPRE^00016 ), was a "

+ "remarkable statesman and leader. Born on February 12, 1809 ( FEBRU^01809 ), in a humble log cabin in Kentucky, Lincoln "

+ "rose to prominence through his legal and political career. He played a pivotal role in preserving the Union during the "

+ "American Civil War and was a driving force behind the abolition of slavery with the Emancipation Proclamation. "

+ "His unwavering dedication to the principles of liberty and equality earned him the nickname \"The Great Emancipator.\" Tragically, "

+ "he was assassinated by John Wilkes Booth on April 14, 1865 ( APRIL^01865 ), but his vision of a united and free nation "

+ "lives on as a guiding light for generations. H. G. Wells, a visionary British writer, was born on September 21, 1866 ( SEPTE^01866 ). "

+ "He is often referred to as the \"father of science fiction\" for his groundbreaking contributions to the genre. "

+ "Wells authored numerous novels and short stories, with some of his most famous works including \"The War of the Worlds,\" \"The Time Machine,\" "

+ "and \"The Invisible Man,\" but not yzyzzyzzzyyyz. Through his imaginative storytelling, Wells explored complex themes such as "

+ "time travel, alien invasions, and the consequences of unchecked scientific progress. His work not only entertained readers but "

+ "also inspired scientific and philosophical discussions that continue to this day. Hunter S. Thompson, a maverick journalist and author, "

+ "was known for his distinctive and unconventional writing style known as \"gonzo journalism.\" Born on July 18, 1937, Thompson fearlessly "

+ "immersed himself in his stories, injecting his subjective experiences into the narrative. His most famous work, \"Fear and Loathing in Las Vegas,\" "

+ "captured the counterculture spirit of the 1960s and pushed the boundaries of traditional journalism. Thompson's fierce critique of American politics "

+ "and culture made him an influential figure, both as a writer and as a social commentator. Martin Luther King, Jr., born on January 15, 1929 ( JANUA^01929 ), "

+ "was a towering figure in the American civil rights movement. As a Baptist minister and civil rights activist, he advocated for nonviolent protest and fought "

+ "against racial segregation and discrimination. King's powerful speeches, including the iconic \"I Have a Dream\" speech delivered during the March on Washington in 1963, "

+ "resonated with millions and inspired people of all races to join the struggle for equality and justice. His tireless efforts culminated "

+ "in the passage of the Civil Rights Act of 1964 and the Voting Rights Act of 1965, significantly advancing the cause of civil rights in the United States. "

+ "Despite their different backgrounds and areas of expertise, these four individuals share common threads that connect them through history. "

+ "They all faced challenges, opposition, and adversity but remained committed to their principles and causes. Their courage, vision, and determination "

+ "have had a profound impact on society, shaping the course of history and inspiring future generations to strive for positive change. In conclusion, "

+ "Abraham Lincoln, H. G. Wells, Hunter S. Thompson, and Martin Luther King, Jr. are extraordinary figures who have left an indelible mark on humanity. "

+ "Their ideas, words, and actions continue to resonate and influence diverse fields, from politics and literature to journalism and civil rights activism. "

+ "As we reflect on their contributions, we are reminded of the power of individuals to effect significant change and the enduring impact of their legacies on our collective consciousness.";

testRegEx(regex1, bodyOfText, 1);

testRegEx(regex2, bodyOfText, 2);

testRegEx(regex3, bodyOfText, 3);

testRegEx(regex4, bodyOfText, 4);

System.out.println("\n\nTotal number of matches : " + countAll);

}

public static void testRegEx(String regex, String bodyOfText, int testExpression) {

int counter = 0;

Pattern pattern = Pattern.compile(regex);

Matcher matcher = pattern.matcher(bodyOfText);

System.out.println("\n\nTesting regex requirement #" + testExpression + ":");

while (matcher.find()) {

String match = matcher.group();

//Added this conditional for providing a screenshot of the successful build and a full print out

if (counter < 6) {

System.out.println("Match found: " + match);

}

counter++;

countAll++;

}

System.out.println("Total number of matches for expression #" + testExpression + ": " + counter);

}

}

A screenshot of a computer program

Description automatically generated

Lesson 6:

(define (even1? e)

(if (= (modulo e 2) 0)

#t

#f))

(define (odd1? o)

(if (= (modulo o 2) 0)

#t

#f))

(display "Is 2 even: ")

(display(equal? (even1? 2) #t))

(newline)

(display "Is 1 even: ")

(display(equal?(even1? 1) #f))

(newline)

(display "Is 1 odd: ")

(display(equal? (odd1? 1) #t))

(newline)

(display "Is 2 odd: ")

(display(equal? (odd1? 2) #f))

(newline)

(display "Does 2 squared equal 4: ")

(display(equal? (square 2) 4))

(newline)

(display "2 squared = ")

(display(square 2))

A screen shot of a computer program

Description automatically generated

A screenshot of a computer program

Description automatically generated