**Technical Design Document: Programming Exercise 6**

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**Program Description:**  
This program validates a user's phone number, Social Security number, and ZIP code using regular expressions. The user inputs their data, and the program checks whether each entry follows the expected format. The program then displays whether the input is valid or invalid.

**Functions Used in the Program (Listed in Order of Execution):**

**1. Function Name: validate\_phone(phone)**

* **Description:** This function validates a phone number format.
* **Parameters:**
  + phone (string): The phone number entered by the user.
* **Variables:**
  + pattern (string): Regular expression pattern to validate phone numbers.
* **Logical Steps:**
  + Define a regex pattern that matches phone numbers in either (XXX) XXX-XXXX or XXX-XXX-XXXX format.
  + Use re.match() to check if the input matches the pattern.
  + Return True if the input is valid, otherwise return False.
* **Returns:**
  + True (valid phone number) or False (invalid phone number).

**2. Function Name: validate\_ssn(ssn)**

* **Description:** This function validates a Social Security number (SSN) format.
* **Parameters:**
  + ssn (string): The SSN entered by the user.
* **Variables:**
  + pattern (string): Regular expression pattern to validate SSNs.
* **Logical Steps:**
  + Define a regex pattern that matches SSNs in the XXX-XX-XXXX format.
  + Use re.match() to check if the input matches the pattern.
  + Return True if the input is valid, otherwise return False.
* **Returns:**
  + True (valid SSN) or False (invalid SSN).

**3. Function Name: validate\_zip(zip\_code)**

* **Description:** This function validates a ZIP code format.
* **Parameters:**
  + zip\_code (string): The ZIP code entered by the user.
* **Variables:**
  + pattern (string): Regular expression pattern to validate ZIP codes.
* **Logical Steps:**
  + Define a regex pattern that matches ZIP codes in either XXXXX or XXXXX-XXXX format.
  + Use re.match() to check if the input matches the pattern.
  + Return True if the input is valid, otherwise return False.
* **Returns:**
  + True (valid ZIP code) or False (invalid ZIP code).

**4. Function Name: main()**

* **Description:** This function collects user input and validates the entries using the previous functions.
* **Parameters:** None.
* **Variables:**
  + phone (string): User input for phone number.
  + ssn (string): User input for SSN.
  + zip\_code (string): User input for ZIP code.
* **Logical Steps:**
  + Prompt the user to enter their phone number.
  + Prompt the user to enter their SSN.
  + Prompt the user to enter their ZIP code.
  + Call validate\_phone(), validate\_ssn(), and validate\_zip() to validate the inputs.
  + Print whether each entry is valid or invalid.
* **Returns:** None.

**Logical Steps of the Program:**

1. Prompt the user to enter a phone number.
2. Prompt the user to enter a Social Security number.
3. Prompt the user to enter a ZIP code.
4. Validate each input using the corresponding functions.
5. Display validation results for each input.

**Testing Plan:** To ensure correctness, the program should be tested with the following inputs:

|  |  |  |
| --- | --- | --- |
| Input Type | Valid Example | Invalid Example |
| Phone Number | (123) 456-7890 | 1234567890 |
| Phone Number | 123-456-7890 | (123)-456-7890 |
| Social Security | 123-45-6789 | 123456789 |
| ZIP Code | 12345 | 12-345 |
| ZIP Code | 12345-6789 | 1234 |

This document outlines the program's structure, function descriptions, and testing methodology to ensure accuracy and reliability.

**Link to repository:** https://github.com/CarsonHarbin/COP2373