Regular expressions and Exception Handling

# Exception Handling – 7 Questions

1. What is the difference between `except Exception as e:` and `except:`? Which is preferred and why?

2. Write a program that reads a number from the user and divides 100 by that number. Handle:  
 - `ValueError` if input is not a number  
 - `ZeroDivisionError` if input is 0  
 - Any other unexpected error

3. What is the use of the `finally` block in Python? Give an example where `finally` is essential (e.g., closing a file or DB connection).

4. Create a custom exception class `InvalidAgeError` and raise it if the age is less than 18.

5. What will the following code output?  
  
 try:  
 print(1 / 0)  
 except ZeroDivisionError:  
 print("Divided by zero")  
 finally:  
 print("Done")

6. Modify the program to retry 3 times if user enters an invalid number (handle `ValueError`). After 3 failures, exit the program.

7. What is the difference between `raise` and `assert`? Give an example of each.

# Regular Expressions – 8 Questions

8. Write a regex pattern to match:  
 - At least one uppercase letter  
 - At least one digit  
 - At least one special character from `@#$%&`  
 - Minimum 8 characters

9. Explain the difference between `re.match()` and `re.search()` with code examples.

10. Given a string: "Email me at test123@gmail.com or hr@openai.org"  
Extract all email addresses using regex.

11. Validate if a string is a valid Indian mobile number (10 digits starting with 6-9).

12. What does the following pattern do?  
  
 r"^[A-Za-z0-9\_]{3,15}$"  
   
Explain in plain English.

13. Extract all the hashtags from the text:  
   
 text = "I love #Python and #MachineLearning! #AI"

14. What is the purpose of `re.match()`? Show how it improves performance when using the same pattern multiple times.

15. Write a Python function to:  
 - Read a string from user input  
 - Validate if it is a strong password using regex  
 - At least one uppercase letter  
 - At least one lowercase letter  
 - At least one number  
 - At least one special character  
 - At least 8 characters