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Lecture 11: Exception Handling in Object-Oriented Programming

1. Introduction

Exception handling is essential for building robust programs. It allows the program to respond gracefully to unexpected errors during execution.

2. Basics of Exception Handling in Python

Python uses `try`, `except`, `else`, and `finally` blocks to handle exceptions.

```
try:
    num = int(input("Enter a number: "))
    result = 10 / num
except ZeroDivisionError:
    print("Cannot divide by zero!")
except ValueError:
    print("Invalid input! Please enter a valid number.")
else:
    print(f"Result is {result}")
finally:
    print("Execution complete.")
```

3. Custom Exceptions

You can create your own exceptions by inheriting from the built-in `Exception` class.

```
class NegativeNumberError(Exception):
    pass

def check_positive(num):
    if num < 0:
        raise NegativeNumberError("Negative numbers are not allowed!")

try:
    check_positive(-5)
```

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```
except NegativeNumberError as e:
    print(e)
```

4. Exception Handling in Classes

Integrate exception handling within class methods to manage errors gracefully.

```
class BankAccount:
    def __init__(self, balance=0):
        self.balance = balance

    def withdraw(self, amount):
        try:
            if amount > self.balance:
                raise ValueError("Insufficient funds")
            self.balance -= amount
        except ValueError as e:
            print(e)
```

5. Exercises

1. Modify the `BankAccount` class to handle invalid deposit and withdrawal amounts using exceptions.
2. Create a custom exception `InvalidAgeError` and use it in a `Person` class to validate age input.

6. Summary

Proper exception handling helps maintain program stability and improves user experience by handling errors without abrupt crashes.

7. References

1. Python Docs - Errors and Exceptions
2. Real Python - Exception Handling