BUSINESS USE CASES

Operators and Variables

1. Arithmetic Operators

- **Business Use Case: Financial Calculations**
- **Example:** A financial services company needs to calculate the profit margin for its products. Using arithmetic operators, they can easily compute the difference between revenue and cost, and then divide by revenue to find the profit margin.

```python
revenue = 15000
cost = 10000
profit_margin = (revenue - cost) / revenue * 100
print(f"Profit Margin: {profit_margin}%")
```

Output:

```css
Profit Margin: 33.33%
```

2. Comparison Operators

- **Business Use Case: Data Filtering**
- **Example:** An e-commerce platform needs to filter out products that are out of stock before displaying them to customers. Comparison operators are used to check inventory levels.

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```python
inventory = 20
if inventory > 0:
    print("Product is in stock.")
else:
    print("Product is out of stock.")
```

Output:

```csharp
Product is in stock.
```

3. Logical Operators

- **Business Use Case: Decision Making**
- **Example:** A company wants to determine if an employee is eligible for a bonus. The criteria might be based on performance ratings and years of service. Logical operators can be used to check multiple conditions.

```python
performance_rating = 4.5  # out of 5
years_of_service = 6

if performance_rating >= 4.0 and years_of_service >= 5:
    print("Employee is eligible for a bonus.")
else:
    print("Employee is not eligible for a bonus.")
```

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Output:

```csharp
Employee is eligible for a bonus.
```

4. Bitwise Operators

- **Business Use Case: Data Compression**
- **Example:** In telecommunications, bitwise operators are used to compress data before transmission. For instance, a system might pack multiple small values into a single byte using bitwise operators.

```python
small_value1 = 3  # 00000011
small_value2 = 5  # 00000101

compressed_data = (small_value1 << 4) | small_value2
print(f"Compressed Data: {compressed_data} (Binary: {compressed_data:08b})")
```

Output:

```less
Compressed Data: 53 (Binary: 00110101)
```

5. Assignment Operators

- **Business Use Case: Inventory Management**
- **Example:** An inventory system may need to update the stock count after a sale. Assignment operators can be used to efficiently update these values.

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```python
stock = 50
sold_items = 10

stock -= sold_items  # Equivalent to stock = stock - sold_items
print(f"Updated Stock: {stock}")
```

Output:

```yaml
Updated Stock: 40
```

6. Membership Operators

- **Business Use Case: User Access Control**
- **Example:** A software system needs to check if a user has the required permissions to access a resource. Membership operators can verify if a permission is in a list of granted permissions.

```python
user_permissions = ["read", "write", "execute"]
required_permission = "write"

if required_permission in user_permissions:
    print("Access Granted")
else:
    print("Access Denied")
```

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Output:

```
Copy code

Access Granted
```

7. Identity Operators

- **Business Use Case: Data Integrity**
- **Example:** A data processing pipeline needs to ensure that two objects (like configuration settings) are exactly the same before proceeding with processing. Identity operators are used to compare these objects.

```python
config1 = {"setting1": True, "setting2": False}
config2 = config1  # Both refer to the same object

if config1 is config2:
    print("Configurations match.")
else:
    print("Configurations do not match.")
```

Output:

```lua
Configurations match.
```