Java Coding Question: Payment Processing System

Problem Statement:

You are required to design a Payment Processing System that can handle different types of payments, such as Credit Card payments and PayPal payments. Each type of payment has its own way of processing, but the system should allow handling them through a common interface.

Requirements:

1. **Interfaces:**

   - Define an interface `Payment` with the following methods:

     - `void processPayment(double amount)`: This method should handle the payment processing.

     - `String getPaymentDetails()`: This method should return a string containing the payment details, including payment type and transaction ID.

2. **Inheritance and Implementation:**

   - Create two classes `CreditCardPayment` and `PayPalPayment` that implement the `Payment` interface.

   - The `CreditCardPayment` class should have the following attributes:

     - `String cardNumber`

     - `String cardHolderName`

     - `String expiryDate`

     - `String transactionId`

   - The `PayPalPayment` class should have the following attributes:

     - `String email`

     - `String transactionId`

   - Implement the `processPayment(double amount)` method in each class to simulate the payment process. Assign a unique `transactionId` after processing the payment.

   - Implement the `getPaymentDetails()` method to return payment type and transaction details for each payment method.

3. **Encapsulation:**

   - Ensure that all attributes in the `CreditCardPayment` and `PayPalPayment` classes are private and accessible only through public getter and setter methods.

4. **Polymorphism:**

   - In the main method of your program, create a list of `Payment` objects and populate it with different types of payments (both credit card and PayPal).

   - Loop through the list and process each payment using the `processPayment(double amount)` method.

   - Print the payment details using the `getPaymentDetails()` method.

Example Output:

```java
java                                                    ⧉ Kodu kopyala

Processing payments...

Credit Card Payment processed. Transaction ID: TXN12345
PayPal Payment processed. Transaction ID: TXN54321

Payment Details:
Payment Type: Credit Card, Transaction ID: TXN12345
Payment Type: PayPal, Transaction ID: TXN54321
```

Bonus:

- Add an additional method `void refundPayment(double amount)` to the `Payment` interface and implement it in both classes to handle refunds. Implement logic to validate that a refund can only be processed if a transaction has already been processed.