Question 1. Categorizing Financial Instruments in a Portfolio

public interface IFinancialInstrument

{

decimal MarketValue { get; }

string Type { get; }

}

public interface ICategoryStrategy

{

string Categorize(double marketValue);

}

public class LowValueCategoryStrategy : ICategoryStrategy

{

public string Categorize(double marketValue)

{

return marketValue < 1000000 ? "Low Value" : "";

}

}

public class MediumValueCategoryStrategy : ICategoryStrategy

{

public string Categorize(double marketValue)

{

return marketValue >= 1000000 && marketValue <= 5000000 ? "Medium Value" : "";

}

}

public class HighValueCategoryStrategy : ICategoryStrategy

{

public string Categorize(double marketValue)

{

return marketValue > 5000000 ? "High Value" : "";

}

}

public class CategoryContext

{

private ICategoryStrategy strategy;

public CategoryContext(ICategoryStrategy strategy)

{

this.strategy = strategy;

}

public string GetCategory(double marketValue)

{

return strategy.Categorize(marketValue);

}

}

public class FinancialInstrument : IFinancialInstrument

{

public double MarketValue { get; set; }

public string Type { get; set; }

}

public class CategoryController

{

private CategoryContext categoryContext;

public CategoryController(ICategoryStrategy strategy)

{

categoryContext = new CategoryContext(strategy);

}

public string GetCategory(IFinancialInstrument instrument)

{

return categoryContext.GetCategory(instrument.MarketValue);

}

}

class Program

{

static void Main()

{

var instruments = new List<IFinancialInstrument>

{

new FinancialInstrument { MarketValue = 800000, Type = "Stock" },

new FinancialInstrument { MarketValue = 1500000, Type = "Bond" },

new FinancialInstrument { MarketValue = 6000000, Type = "Derivative" },

new FinancialInstrument { MarketValue = 300000, Type = "Stock" }

};

var controller = new CategoryController(new LowValueCategoryStrategy());

foreach (var instrument in instruments)

{

string category = controller.GetCategory(instrument);

Console.WriteLine(category);

}

}

}

Question 2. SQL Procedure for Categorizing Financial Instruments

CREATE TABLE FinancialInstruments (

InstrumentID INT PRIMARY KEY,

MarketValue DECIMAL(18, 2),

Type NVARCHAR(50)

);

INSERT INTO FinancialInstruments (InstrumentID, MarketValue, Type)

VALUES

(1, 800000, 'Stock'),

(2, 1500000, 'Bond'),

(3, 6000000, 'Derivative'),

(4, 300000, 'Stock');

CREATE PROCEDURE CategorizeInstruments

AS

BEGIN

DECLARE @InstrumentID INT;

DECLARE @MarketValue DECIMAL(18, 2);

DECLARE @Type NVARCHAR(50);

DECLARE @Category NVARCHAR(50);

DECLARE instrumentsCursor CURSOR FOR

SELECT InstrumentID, MarketValue, Type

FROM FinancialInstruments;

OPEN instrumentsCursor;

FETCH NEXT FROM instrumentsCursor INTO @InstrumentID, @MarketValue, @Type;

WHILE @@FETCH\_STATUS = 0

BEGIN

IF @MarketValue < 1000000

SET @Category = 'Low Value';

ELSE IF @MarketValue >= 1000000 AND @MarketValue <= 5000000

SET @Category = 'Medium Value';

ELSE

SET @Category = 'High Value';

INSERT INTO InstrumentCategories (InstrumentID, Category)

VALUES (@InstrumentID, @Category);

FETCH NEXT FROM instrumentsCursor INTO @InstrumentID, @MarketValue, @Type;

END

CLOSE instrumentsCursor;

DEALLOCATE instrumentsCursor;

END;