**Exercise 2: Implementing the Factory Method Pattern**

***Subject.cs***

public interface Subject

{

    void ShowSubject();

}

***Program.cs***

using System;

public class Program

{

    public class Math : Subject

    {

        public void ShowSubject()

        {

            Console.WriteLine("This is Mathematics.");

        }

    }

    public class Science : Subject

    {

        public void ShowSubject()

        {

            Console.WriteLine("This is Science.");

        }

    }

    public class English : Subject

    {

        public void ShowSubject()

        {

            Console.WriteLine("This is English.");

        }

    }

    public class SubjectFactory

    {

        public Subject GetSubject(string type)

        {

            if (string.IsNullOrEmpty(type)) return null;

            switch (type.ToUpper())

            {

                case "MATH": return new Math();

                case "SCIENCE": return new Science();

                case "ENGLISH": return new English();

                default:

                    Console.WriteLine("Unknown subject: " + type);

                    return null;

            }

        }

    }

    public static void Main(string[] args)

    {

        SubjectFactory factory = new SubjectFactory();

        Subject s1 = factory.GetSubject("Math");

        s1?.ShowSubject();

        Subject s2 = factory.GetSubject("Science");

        s2?.ShowSubject();

        Subject s3 = factory.GetSubject("English");

        s3?.ShowSubject();

    }

}

