שיעורי בית יסודות עבודה עצמית מחלקות – אופיר הופמן י3

תרגיל 1 – שעון אנלוגי

```
class AnalogClock
{
    private int hours;
    private int minutes;
    private int seconds;

    public AnalogClock()
    {
    }

    public bool SetTime(int h, int m, int s)
    {
        if (m < 60 && s < 60 && h < 24)
        {
            this.hours = h;
            this.minutes = m;
            this.seconds = s;
            return true;
        }
        return false;
    }

    public void AddSecond()
    {
        if(this.seconds == 59)
        {
            this.seconds = 0;
            if (this.minutes == 59)
            {
                this.minutes = 0;
                if (this.hours == 23)
                {
                    this.hours = 0;
                }
            }
        }
        else
        {
            this.seconds++;
        }
    }

    const double Hour_Angle_Per_Min = 0.5;
    const double Minute_Angle_Per_Min = 6;
    const double Hour_Angle_Per_Hour = 30;

    public double GetClockAngle()
    {
        double hours_angle;
        double minutes_angle;

        hours_angle = (Hour_Angle_Per_Min * minutes) + (Hour_Angle_Per_Hour * (hours % 12));

        minutes_angle = Minute_Angle_Per_Min * minutes;

        if (hours_angle > minutes_angle)
        {
            return (hours_angle - minutes_angle);
        }
        return (minutes_angle - hours_angle);
    }
```

```
public override string ToString()
    {
        return string.Format("{0:00}:{1:00}:{2:00}  angle:{3:0.00} ", hours, minutes, seconds,
GetClockAngle());
    }

}


class Program
{
    static void Main(string[] args)
    {
        AnalogClock clock1 = new AnalogClock();
        clock1.SetTime(12, 0, 0);

        AnalogClock clock_NewYork = new AnalogClock();
        clock_NewYork.SetTime(5, 0, 0);

        AnalogClock clock_London = new AnalogClock();
        clock_London.SetTime(10, 0, 0);

        AnalogClock clock_Spain = new AnalogClock();
        clock_Spain.SetTime(11, 0, 0);

        AnalogClock clock_Tokyo = new AnalogClock();
        clock_Tokyo.SetTime(19, 0, 0);
        Console.WriteLine(clock_Tokyo);


        bool cont = true;
        while (cont == true)
        {
            if (Console.KeyAvailable)
            {
                ConsoleKeyInfo k = Console.ReadKey();
                if (k.Key == ConsoleKey.Escape)
                {
                    cont= false;
                }
            }

            Console.WriteLine("Local: " + clock1);
            clock1.AddSecond();
            Console.WriteLine("New York: " + clock_NewYork);
            clock_NewYork.AddSecond();
            Console.WriteLine("London: " + clock_London);
            clock_London.AddSecond();
            Console.WriteLine("Spain: " + clock_Spain);
            clock_Spain.AddSecond();
            Console.WriteLine("Tokyo: " + clock_Tokyo);
            clock_Tokyo.AddSecond();

            Console.SetCursorPosition(0, 0);

            Thread.Sleep(1000);
        }
    }
}
```

המשך למטה

תרגיל 2 – כמה ימים בפברואר

```
public static int HowManyDays(int year)
{
    int leapYear = year % 19;
    if (leapYear == 3 || leapYear == 6 || leapYear == 8 || leapYear == 11 || leapYear == 14 ||
leapYear == 17 || leapYear == 0)
        return 29;
    else
        return 28;
}

static void Main(string[] args)
{
    Console.WriteLine(HowManyDays(2020));
}
```

תרגיל 3 – הפיכת מספר 180 מעלות

```
internal class Program
    {
        public static int Digits(long num)
        {
            int count = 0;
            while(num!=0)
            {
                num /= 10;
                count++;
            }
            return count;
        }

        public static bool SpinNum(long num)
        {
            int powerOfTen = Digits(num)-1;

            long saveNum = num;
            long newNum = 0;
            while(num > 0)
            {
                long units = num % 10;

                if (units == 6)
                    newNum += (long)Math.Pow(10, powerOfTen) * 9;
                else if (units == 9)
                    newNum += (long)Math.Pow(10, powerOfTen) * 6;
                else
                    newNum += (long)Math.Pow(10, powerOfTen) * units;

                powerOfTen--;
                num /= 10;
            }

            if (newNum == saveNum)
            {
                return true;
            }
            return false;
        }

        static void Main(string[] args)
        {
            long x = 100006900001;
            Console.WriteLine(x + " " + SpinNum(x));
            x = 916;
            Console.WriteLine(x + " " + SpinNum(x));
            x = 96;
            Console.WriteLine(x + " " + SpinNum(x));
```

```
        x = 180619081;
        Console.WriteLine(x + " " + SpinNum(x));
        x = 61801010819;
        Console.WriteLine(x + " " + SpinNum(x));
        x = 304815;
        Console.WriteLine(x + " " + SpinNum(x));
        x = 110;
        Console.WriteLine(x + " " + SpinNum(x));

        Console.WriteLine("Press key !");
        Console.ReadKey();

    }
}
```