**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();

}

}