**РУСЕНСКИ УНИВЕРСИТЕТ „АНГЕЛ КЪНЧЕВ“**

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ПО

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# Задание

Да се разработи програмна система, симулираща работата на модула за **оптимизация на достъпа до дискова памет – стратегия Shortest Seek Time First** при следните изходни данни:

* ***Основни необходими структури:***
  + Buffer[1..M] буфер със заявките към диска със структура:
    - Cylinder номер на цилиндър
* ***Основни обработки:***
  + Request(Cyl) генериране на нова заявка към цилиндър Cyl;
  + SelectReq избор и обслужване на заявка по SSTF;
  + Show показване на състоянието на основните структури

Разработеният проект да има подходящ потребителски интерфейс за обръщение към основните обработки. Обяснителната записка да съдържа заданието, описание на използваните структури данни и алгоритми и програмен листинг.

# Описание на използваните структури данни и алгоритми

При планирането на принципа SSTF (Shortest-Seek-Time-First) първа се обслужва заявката с най-кратко време за търсене от текущото положение на главата. Тъй като времето за търсене, най-общо, е пропорционално на разстоянието между цилиндрите в отделните заявки, тя се реализира чрез придвижване на главата към най-близкия цилиндър, заявен в опашката.

SSTF рязко дискриминира определени заявки, възможно е да се предизвика отлагане на заявките.

* Global.NumberOfCylinders – броят на цилиндрите
* Global.HeaderPosition – позиция на главата (*започва от позиция 0)*
* Global.NumberOfSteps – брой стъпки N
* List<Request> requests; - главна опашка със заявки
* private void button1\_Click(object sender, EventArgs e) – за добавяне на нова заявка в списъка requests;
* private void Repaint() – за обновяване на данните в таблицата
* private void button2\_Click(object sender, EventArgs e) – за избор и обслужване на заявка по SSTF
* private Request SSTF() – функцията, реализира алгоритъма SSTF и като резултат се връща избраната заявка.

# Код на програмата (листинг)



## Program.cs

using System;

using System.Collections.Generic;

using System.Linq;

using System.Threading.Tasks;

using System.Windows.Forms;

namespace OS\_SSTF

{

static class Program

{

/// <summary>

/// The main entry point for the application.

/// </summary>

[STAThread]

static void Main()

{

Application.EnableVisualStyles();

Application.SetCompatibleTextRenderingDefault(false);

Application.Run(new frmInput());

}

}

}

## frmMain.cs

using System;

using System.Collections.Generic;

using System.Windows.Forms;

namespace OS\_SSTF

{

class Request

{

private decimal cylinder;

public decimal Cylinder

{

get

{

return cylinder;

}

set

{

cylinder = value;

}

}

public Request(decimal cylinder)

{

this.Cylinder = cylinder;

}

}

public partial class frmMain : Form

{

List<Request> requests;

public frmMain()

{

InitializeComponent();

requests = new List<Request>();

}

private void button1\_Click(object sender, EventArgs e)

{

requests.Add(new Request(numericUpDown1.Value));

button2.Enabled = true;

Repaint();

}

private void Repaint()

{

BindingSource bs = new BindingSource();

bs.DataSource = requests;

dataGridView1.DataSource = bs;

}

private void button2\_Click(object sender, EventArgs e)

{

Request r = SSTF();

if (r != null)

{

label4.Text = r.Cylinder.ToString();

Global.HeaderPosition = r.Cylinder;

requests.Remove(r);

Repaint();

}

if (requests.Count == 0)

{

button2.Enabled = false;

label4.Text = "~";

MessageBox.Show("Няма други заявки!");

}

}

private Request SSTF()

{

Request result = null;

decimal min = decimal.MaxValue;

for (int i = 0; i < requests.Count; i++)

{

decimal buf = Math.Abs(Global.HeaderPosition - requests[i].Cylinder);

if (buf < min)

{

min = buf;

result = requests[i];

}

}

return result;

}

private void frmMain\_FormClosing(object sender, FormClosingEventArgs e)

{

Application.Exit();

}

}

}

## frmMain.Designer.cs

namespace OS\_SSTF

{

partial class frmMain

{

/// <summary>

/// Required designer variable.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Clean up any resources being used.

/// </summary>

/// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>

protected override void Dispose(bool disposing)

{

if (disposing && (components != null))

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Windows Form Designer generated code

/// <summary>

/// Required method for Designer support - do not modify

/// the contents of this method with the code editor.

/// </summary>

private void InitializeComponent()

{

System.Windows.Forms.DataGridViewCellStyle dataGridViewCellStyle5 = new System.Windows.Forms.DataGridViewCellStyle();

this.splitContainer1 = new System.Windows.Forms.SplitContainer();

this.dataGridView1 = new System.Windows.Forms.DataGridView();

this.tableLayoutPanel1 = new System.Windows.Forms.TableLayoutPanel();

this.tableLayoutPanel4 = new System.Windows.Forms.TableLayoutPanel();

this.label4 = new System.Windows.Forms.Label();

this.label3 = new System.Windows.Forms.Label();

this.tableLayoutPanel2 = new System.Windows.Forms.TableLayoutPanel();

this.label1 = new System.Windows.Forms.Label();

this.button1 = new System.Windows.Forms.Button();

this.tableLayoutPanel3 = new System.Windows.Forms.TableLayoutPanel();

this.button2 = new System.Windows.Forms.Button();

this.numericUpDown1 = new System.Windows.Forms.NumericUpDown();

((System.ComponentModel.ISupportInitialize)(this.splitContainer1)).BeginInit();

this.splitContainer1.Panel1.SuspendLayout();

this.splitContainer1.Panel2.SuspendLayout();

this.splitContainer1.SuspendLayout();

((System.ComponentModel.ISupportInitialize)(this.dataGridView1)).BeginInit();

this.tableLayoutPanel1.SuspendLayout();

this.tableLayoutPanel4.SuspendLayout();

this.tableLayoutPanel2.SuspendLayout();

this.tableLayoutPanel3.SuspendLayout();

((System.ComponentModel.ISupportInitialize)(this.numericUpDown1)).BeginInit();

this.SuspendLayout();

//

// splitContainer1

//

this.splitContainer1.Dock = System.Windows.Forms.DockStyle.Fill;

this.splitContainer1.Location = new System.Drawing.Point(0, 0);

this.splitContainer1.Name = "splitContainer1";

//

// splitContainer1.Panel1

//

this.splitContainer1.Panel1.Controls.Add(this.dataGridView1);

//

// splitContainer1.Panel2

//

this.splitContainer1.Panel2.Controls.Add(this.tableLayoutPanel1);

this.splitContainer1.Size = new System.Drawing.Size(766, 479);

this.splitContainer1.SplitterDistance = 445;

this.splitContainer1.TabIndex = 0;

//

// dataGridView1

//

this.dataGridView1.AllowUserToAddRows = false;

this.dataGridView1.AllowUserToDeleteRows = false;

this.dataGridView1.AutoSizeColumnsMode = System.Windows.Forms.DataGridViewAutoSizeColumnsMode.Fill;

this.dataGridView1.ColumnHeadersHeightSizeMode = System.Windows.Forms.DataGridViewColumnHeadersHeightSizeMode.AutoSize;

this.dataGridView1.Dock = System.Windows.Forms.DockStyle.Fill;

this.dataGridView1.Location = new System.Drawing.Point(0, 0);

this.dataGridView1.Name = "dataGridView1";

this.dataGridView1.ReadOnly = true;

this.dataGridView1.RowHeadersWidthSizeMode = System.Windows.Forms.DataGridViewRowHeadersWidthSizeMode.AutoSizeToAllHeaders;

dataGridViewCellStyle5.SelectionBackColor = System.Drawing.SystemColors.ActiveCaption;

dataGridViewCellStyle5.SelectionForeColor = System.Drawing.Color.White;

this.dataGridView1.RowsDefaultCellStyle = dataGridViewCellStyle5;

this.dataGridView1.SelectionMode = System.Windows.Forms.DataGridViewSelectionMode.FullRowSelect;

this.dataGridView1.Size = new System.Drawing.Size(445, 479);

this.dataGridView1.TabIndex = 0;

//

// tableLayoutPanel1

//

this.tableLayoutPanel1.CellBorderStyle = System.Windows.Forms.TableLayoutPanelCellBorderStyle.InsetDouble;

this.tableLayoutPanel1.ColumnCount = 1;

this.tableLayoutPanel1.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Percent, 100F));

this.tableLayoutPanel1.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Absolute, 20F));

this.tableLayoutPanel1.Controls.Add(this.tableLayoutPanel4, 0, 2);

this.tableLayoutPanel1.Controls.Add(this.tableLayoutPanel2, 0, 0);

this.tableLayoutPanel1.Controls.Add(this.tableLayoutPanel3, 0, 1);

this.tableLayoutPanel1.Dock = System.Windows.Forms.DockStyle.Fill;

this.tableLayoutPanel1.Location = new System.Drawing.Point(0, 0);

this.tableLayoutPanel1.Name = "tableLayoutPanel1";

this.tableLayoutPanel1.RowCount = 3;

this.tableLayoutPanel1.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 19.62422F));

this.tableLayoutPanel1.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 28.39248F));

this.tableLayoutPanel1.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 52.19207F));

this.tableLayoutPanel1.Size = new System.Drawing.Size(317, 479);

this.tableLayoutPanel1.TabIndex = 0;

//

// tableLayoutPanel4

//

this.tableLayoutPanel4.ColumnCount = 1;

this.tableLayoutPanel4.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Percent, 100F));

this.tableLayoutPanel4.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Absolute, 20F));

this.tableLayoutPanel4.Controls.Add(this.label4, 0, 1);

this.tableLayoutPanel4.Controls.Add(this.label3, 0, 0);

this.tableLayoutPanel4.Dock = System.Windows.Forms.DockStyle.Fill;

this.tableLayoutPanel4.Location = new System.Drawing.Point(6, 235);

this.tableLayoutPanel4.Name = "tableLayoutPanel4";

this.tableLayoutPanel4.RowCount = 2;

this.tableLayoutPanel4.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel4.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel4.Size = new System.Drawing.Size(305, 238);

this.tableLayoutPanel4.TabIndex = 2;

//

// label4

//

this.label4.Anchor = ((System.Windows.Forms.AnchorStyles)(((System.Windows.Forms.AnchorStyles.Top | System.Windows.Forms.AnchorStyles.Left)

| System.Windows.Forms.AnchorStyles.Right)));

this.label4.AutoSize = true;

this.label4.Font = new System.Drawing.Font("Microsoft Sans Serif", 10F, System.Drawing.FontStyle.Bold, System.Drawing.GraphicsUnit.Point, ((byte)(204)));

this.label4.Location = new System.Drawing.Point(3, 119);

this.label4.Name = "label4";

this.label4.Size = new System.Drawing.Size(299, 17);

this.label4.TabIndex = 1;

this.label4.Text = "~";

this.label4.TextAlign = System.Drawing.ContentAlignment.MiddleCenter;

//

// label3

//

this.label3.Anchor = ((System.Windows.Forms.AnchorStyles)(((System.Windows.Forms.AnchorStyles.Bottom | System.Windows.Forms.AnchorStyles.Left)

| System.Windows.Forms.AnchorStyles.Right)));

this.label3.AutoSize = true;

this.label3.Location = new System.Drawing.Point(3, 106);

this.label3.Name = "label3";

this.label3.Size = new System.Drawing.Size(299, 13);

this.label3.TabIndex = 0;

this.label3.Text = "Обслужва се заявката на цилиндър";

this.label3.TextAlign = System.Drawing.ContentAlignment.MiddleCenter;

//

// tableLayoutPanel2

//

this.tableLayoutPanel2.ColumnCount = 2;

this.tableLayoutPanel2.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel2.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel2.Controls.Add(this.label1, 0, 0);

this.tableLayoutPanel2.Controls.Add(this.button1, 1, 1);

this.tableLayoutPanel2.Controls.Add(this.numericUpDown1, 1, 0);

this.tableLayoutPanel2.Dock = System.Windows.Forms.DockStyle.Fill;

this.tableLayoutPanel2.Location = new System.Drawing.Point(6, 6);

this.tableLayoutPanel2.Name = "tableLayoutPanel2";

this.tableLayoutPanel2.RowCount = 3;

this.tableLayoutPanel2.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 33.33333F));

this.tableLayoutPanel2.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 33.33333F));

this.tableLayoutPanel2.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 33.33333F));

this.tableLayoutPanel2.Size = new System.Drawing.Size(305, 85);

this.tableLayoutPanel2.TabIndex = 0;

//

// label1

//

this.label1.Anchor = System.Windows.Forms.AnchorStyles.Right;

this.label1.AutoSize = true;

this.label1.Location = new System.Drawing.Point(38, 7);

this.label1.Name = "label1";

this.label1.Size = new System.Drawing.Size(111, 13);

this.label1.TabIndex = 0;

this.label1.Text = "Номер на цилиндър:";

//

// button1

//

this.button1.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Top | System.Windows.Forms.AnchorStyles.Bottom)));

this.button1.Location = new System.Drawing.Point(174, 31);

this.button1.Name = "button1";

this.button1.Size = new System.Drawing.Size(108, 22);

this.button1.TabIndex = 4;

this.button1.Text = "Пусни заявка";

this.button1.UseVisualStyleBackColor = true;

this.button1.Click += new System.EventHandler(this.button1\_Click);

//

// tableLayoutPanel3

//

this.tableLayoutPanel3.ColumnCount = 1;

this.tableLayoutPanel3.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Percent, 100F));

this.tableLayoutPanel3.ColumnStyles.Add(new System.Windows.Forms.ColumnStyle(System.Windows.Forms.SizeType.Absolute, 20F));

this.tableLayoutPanel3.Controls.Add(this.button2, 0, 0);

this.tableLayoutPanel3.Dock = System.Windows.Forms.DockStyle.Fill;

this.tableLayoutPanel3.Location = new System.Drawing.Point(6, 100);

this.tableLayoutPanel3.Name = "tableLayoutPanel3";

this.tableLayoutPanel3.RowCount = 2;

this.tableLayoutPanel3.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel3.RowStyles.Add(new System.Windows.Forms.RowStyle(System.Windows.Forms.SizeType.Percent, 50F));

this.tableLayoutPanel3.Size = new System.Drawing.Size(305, 126);

this.tableLayoutPanel3.TabIndex = 1;

//

// button2

//

this.button2.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Left | System.Windows.Forms.AnchorStyles.Right)));

this.button2.Enabled = false;

this.button2.Location = new System.Drawing.Point(3, 14);

this.button2.Name = "button2";

this.button2.Size = new System.Drawing.Size(299, 35);

this.button2.TabIndex = 0;

this.button2.Text = "Избор на заявка по SSTF";

this.button2.UseVisualStyleBackColor = true;

this.button2.Click += new System.EventHandler(this.button2\_Click);

//

// numericUpDown1

//

this.numericUpDown1.Anchor = ((System.Windows.Forms.AnchorStyles)((System.Windows.Forms.AnchorStyles.Left | System.Windows.Forms.AnchorStyles.Right)));

this.numericUpDown1.Location = new System.Drawing.Point(155, 4);

this.numericUpDown1.Name = "numericUpDown1";

this.numericUpDown1.Size = new System.Drawing.Size(147, 20);

this.numericUpDown1.TabIndex = 5;

//

// frmMain

//

this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);

this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;

this.ClientSize = new System.Drawing.Size(766, 479);

this.Controls.Add(this.splitContainer1);

this.Name = "frmMain";

this.Text = "Оптимизация на достъпа до дискова памет - стратегия SSTF";

this.FormClosing += new System.Windows.Forms.FormClosingEventHandler(this.frmMain\_FormClosing);

this.splitContainer1.Panel1.ResumeLayout(false);

this.splitContainer1.Panel2.ResumeLayout(false);

((System.ComponentModel.ISupportInitialize)(this.splitContainer1)).EndInit();

this.splitContainer1.ResumeLayout(false);

((System.ComponentModel.ISupportInitialize)(this.dataGridView1)).EndInit();

this.tableLayoutPanel1.ResumeLayout(false);

this.tableLayoutPanel4.ResumeLayout(false);

this.tableLayoutPanel4.PerformLayout();

this.tableLayoutPanel2.ResumeLayout(false);

this.tableLayoutPanel2.PerformLayout();

this.tableLayoutPanel3.ResumeLayout(false);

((System.ComponentModel.ISupportInitialize)(this.numericUpDown1)).EndInit();

this.ResumeLayout(false);

}

#endregion

private System.Windows.Forms.SplitContainer splitContainer1;

private System.Windows.Forms.DataGridView dataGridView1;

private System.Windows.Forms.TableLayoutPanel tableLayoutPanel1;

private System.Windows.Forms.TableLayoutPanel tableLayoutPanel2;

private System.Windows.Forms.TableLayoutPanel tableLayoutPanel3;

private System.Windows.Forms.TableLayoutPanel tableLayoutPanel4;

private System.Windows.Forms.Label label4;

private System.Windows.Forms.Label label3;

private System.Windows.Forms.Label label1;

private System.Windows.Forms.Button button1;

private System.Windows.Forms.Button button2;

public System.Windows.Forms.NumericUpDown numericUpDown1;

}

}

## frmInput.cs

using System;

using System.Windows.Forms;

namespace OS\_SSTF

{

public partial class frmInput : Form

{

public frmInput()

{

InitializeComponent();

}

private void button1\_Click(object sender, EventArgs e)

{

Global.NumberOfCylinders = numericUpDown1.Value;

Global.HeaderPosition = numericUpDown2.Value;

this.Hide();

frmMain frm = new frmMain();

frm.numericUpDown1.Maximum = Global.NumberOfCylinders - 1;

frm.Show();

}

}

}

## frmInput.Designer.cs

namespace OS\_SSTF

{

partial class frmInput

{

/// <summary>

/// Required designer variable.

/// </summary>

private System.ComponentModel.IContainer components = null;

/// <summary>

/// Clean up any resources being used.

/// </summary>

/// <param name="disposing">true if managed resources should be disposed; otherwise, false.</param>

protected override void Dispose(bool disposing)

{

if (disposing && (components != null))

{

components.Dispose();

}

base.Dispose(disposing);

}

#region Windows Form Designer generated code

/// <summary>

/// Required method for Designer support - do not modify

/// the contents of this method with the code editor.

/// </summary>

private void InitializeComponent()

{

this.numericUpDown1 = new System.Windows.Forms.NumericUpDown();

this.numericUpDown2 = new System.Windows.Forms.NumericUpDown();

this.label1 = new System.Windows.Forms.Label();

this.label2 = new System.Windows.Forms.Label();

this.button1 = new System.Windows.Forms.Button();

((System.ComponentModel.ISupportInitialize)(this.numericUpDown1)).BeginInit();

((System.ComponentModel.ISupportInitialize)(this.numericUpDown2)).BeginInit();

this.SuspendLayout();

//

// numericUpDown1

//

this.numericUpDown1.Location = new System.Drawing.Point(220, 12);

this.numericUpDown1.Maximum = new decimal(new int[] {

1000000,

0,

0,

0});

this.numericUpDown1.Minimum = new decimal(new int[] {

1,

0,

0,

0});

this.numericUpDown1.Name = "numericUpDown1";

this.numericUpDown1.Size = new System.Drawing.Size(120, 20);

this.numericUpDown1.TabIndex = 0;

this.numericUpDown1.Value = new decimal(new int[] {

100,

0,

0,

0});

//

// numericUpDown2

//

this.numericUpDown2.Location = new System.Drawing.Point(220, 38);

this.numericUpDown2.Maximum = new decimal(new int[] {

999999,

0,

0,

0});

this.numericUpDown2.Name = "numericUpDown2";

this.numericUpDown2.Size = new System.Drawing.Size(120, 20);

this.numericUpDown2.TabIndex = 1;

//

// label1

//

this.label1.AutoSize = true;

this.label1.Location = new System.Drawing.Point(97, 19);

this.label1.Name = "label1";

this.label1.Size = new System.Drawing.Size(86, 13);

this.label1.TabIndex = 2;

this.label1.Text = "Брой цилиндри:";

//

// label2

//

this.label2.AutoSize = true;

this.label2.Location = new System.Drawing.Point(75, 45);

this.label2.Name = "label2";

this.label2.Size = new System.Drawing.Size(108, 13);

this.label2.TabIndex = 3;

this.label2.Text = "Позиция на хедъра:";

//

// button1

//

this.button1.Location = new System.Drawing.Point(174, 84);

this.button1.Name = "button1";

this.button1.Size = new System.Drawing.Size(75, 23);

this.button1.TabIndex = 4;

this.button1.Text = "ОК";

this.button1.UseVisualStyleBackColor = true;

this.button1.Click += new System.EventHandler(this.button1\_Click);

//

// frmInput

//

this.AutoScaleDimensions = new System.Drawing.SizeF(6F, 13F);

this.AutoScaleMode = System.Windows.Forms.AutoScaleMode.Font;

this.ClientSize = new System.Drawing.Size(424, 122);

this.Controls.Add(this.button1);

this.Controls.Add(this.label2);

this.Controls.Add(this.label1);

this.Controls.Add(this.numericUpDown2);

this.Controls.Add(this.numericUpDown1);

this.MaximizeBox = false;

this.MaximumSize = new System.Drawing.Size(440, 160);

this.MinimizeBox = false;

this.MinimumSize = new System.Drawing.Size(440, 160);

this.Name = "frmInput";

this.ShowInTaskbar = false;

this.StartPosition = System.Windows.Forms.FormStartPosition.CenterScreen;

this.Text = "Оптимизация на достъпа до дискова памет - стратегия SSTF";

((System.ComponentModel.ISupportInitialize)(this.numericUpDown1)).EndInit();

((System.ComponentModel.ISupportInitialize)(this.numericUpDown2)).EndInit();

this.ResumeLayout(false);

this.PerformLayout();

}

#endregion

private System.Windows.Forms.NumericUpDown numericUpDown1;

private System.Windows.Forms.NumericUpDown numericUpDown2;

private System.Windows.Forms.Label label1;

private System.Windows.Forms.Label label2;

private System.Windows.Forms.Button button1;

}

}

## Global.cs

namespace OS\_SSTF

{

public class Global

{

private static decimal numberOfCylinders;

private static decimal headerPosition;

public static decimal NumberOfCylinders

{

get

{

return numberOfCylinders; }

set

{

numberOfCylinders = value;

}

}

public static decimal HeaderPosition

{

get

{

return headerPosition;

}

set

{

if (value >= numberOfCylinders)

{

headerPosition = numberOfCylinders - 1;

}

else

{

headerPosition = value;

}

}

}

}

}

# Демо







