Ministerul Educaţiei şi Tineretului al Republicii Moldova

**Universitatea Tehnică a Moldovei**

Facultatea „Calculatoare, Informatică şi Microelectronică”

Specialitatea „Tehnologii Informaţionale”

*referat*

**La lucrarea de laborator**

**№1**

**Tema: Pastrarea grafului în memoria calculatorului**

A efectuat studentul gr. AI-151: Brăduleac Vadim

A verificat : Dohotaru Leonid

**Scopul lucrării:**

1. Studierea metodelor de definire a unui graf : matricea de incidență, matricea de adiacență, liste.
2. Elaborarea unor proceduri de introducere , extragere si transformare a diferitelor forme de reprezentare internă a grafurilor cu scoaterea rezultatelor la display si imprimantă.

**Sarcina de bază:**

1. De elaborat procedura de introducere a unui graf în memoria calculatorului în formă de matrice de incidență, de matrice de adiacență și listă de adiacență cu posibilități de analiză a certitudinii.
2. De elaborat proceduri de transformare dintr-o formă de reprezentare în alta.
3. Folosind procedurile enumerate ,de elaborat programul care va permite:

>> introducerea grafului reprezentat sub oricare formă din cele trei forme cu posibilități de corecție a datelor.

>> păstrarea grafului în memoria externă în formă de lista de adiacență.

>> extragerea informației într-una dintre cele trei forme la imprimantă și display.

**Concluzie:**

În urma efectuării acestei lucrări de laborator eu am învățat sa păstrez în memoria calculatorului matricea cu elemente și să o afișez în toate dintre cele 3 forme cu posibilitatea de modificare și ștergere a datelor.

**Imaginea și listingul aplicatiei**

**style.css**

html {-webkit-user-select: none;}

/\* -Laborator- \*/

#main-container input {

border: none;

width: 30px;

height: 25px;

font-size: 14px;

padding: 2px;

text-align: center;

}

#main-container #save, #main-container #input, #main-container #table {

position: relative;

top: 350px;

color: #FFF;

font-family: Verdana, Geneva, sans-serif;

font-size: 16px;

/\*margin-left: -18px;\*/

}

#main-container input:hover {

background-color: #090;

}

#main-container input:focus {

background-color: #ABC;

outline: none;

}

#main-container input:not(:focus) {

text-align: center;

}

#main-container .list input:not(:focus), #main-container .list input{

text-align: left;

}

#main-container table {

border-collapse: collapse;

}

#main-container td {

border: 1px solid #999;

padding: 0;

}

#main-container tr:first-child td, #main-container td:first-child {

background-color: #ccc;

padding: 1px 3px;

font-weight: bold;

font-size: 14px;

text-align: center;

}

#content {

background-color: #000000;

padding: 0 0 0 0;

margin: 0 0 0 40px;

overflow: auto;

}

#tab-container {

position: relative;

left: 1px;

float: left;

margin: 0 0 0 0;

width: 100px;

}

#tab-container ul {

list-style: none;

text-align: center;

}

#tab-container ul li {

border-top: 1px solid #000;

border-right: 1px solid #000;

border-bottom: 1px solid #000;

border-left: 8px solid #000;

background-color: #ddd;

margin: 8px 0;

}

#tab-container ul li a,

#tab-container ul li a:visited {

text-decoration: none;

color: #666;

display: block;

padding: 15px 5px;

}

#tab-container ul li:hover {

border-left: 8px solid #333;

}

#tab-container ul li a:hover {

color: #000;

}

#tab-container ul li.selected {

border-right: none;

background-color: #fff;

border-left: 8px solid #006699;

}

#main-container {

position: absolute;

top: 0px;

left: 0%;

height: 650px;

width: 100%;

background-color: #f00;

overflow: inherit;

}

/\* -Menu- \*/

ul.menu {

list-style: none;

text-align: center;

padding: 0;

list-style-type: none;

margin: 0;

}

ul.menu li {

position: relative;

width: 30%;

height: 80px;

margin-left: 5px;

background-color: #090;

float: left;

cursor: pointer;

transition: all linear 0.3s;

-webkit-transition: all linear 0.3s;

font-family: Verdana, Geneva, sans-serif;

font-size: 20px;

color: #FFF;

line-height: 30px;

}

ul.menu li a,

ul.menu li a:visited {

text-decoration: none;

color: #DFFFFF;

display: block;

padding: 0px 10px;

}

ul.menu li:hover {

border-left: 15px solid #030;

}

ul.menu li a:hover {

color: #FFF333;

}

ul.menu li.selected {

border-left: 15px solid #0F0;

}

/\*Changes\*/

#MD\_title {

position: relative;

top: 20px;

text-align: center;

font-family: Verdana, Geneva, sans-serif;

font-size: 30px;

color: #00FF00;

z-index: 3;

}

#first\_menu {

position: absolute;

left: -130%;

z-index: 10;

transition: all linear 0.5s;

-webkit-transition: all linear 0.5s;

}

#second\_menu {

position: absolute;

left: -130%;

z-index: 10;

transition: all linear 0.5s;

-webkit-transition: all linear 0.5s;

}

#menu\_cont1 {

position: absolute;

top: 80px;

left: 18%;

width: 40%;

height: 80px;

overflow: hidden;

z-index: 20;

}

#menu\_cont2 {

position: absolute;

top: 180px;

left: 18%;

width: 40%;

height: 80px;

overflow: hidden;

z-index: 20;

}

/\*Dropdown Menu 1\*/

#dropdown\_menu1 {

position: absolute;

top: 80px;

left: 3%;

width: 15%;

height: 80px;

background-color: #0015FF;

border-radius: 5px;

z-index: 1;

cursor: pointer;

}

#dropdown\_menu2 {

position: absolute;

top: 180px;

left: 3%;

width: 15%;

height: 80px;

background-color: #0015FF;

border-radius: 5px;

z-index: 1;

cursor: pointer;

}

#dropdown\_menu1, #dropdown\_menu2 {

transition: all linear 0.5s;

-webkit-transition: all linear 0.5s;

}

#dropdown\_menu1:hover, #dropdown\_menu2:hover {

background-color: #060;

}

#data {

position: relative;

top: 22px;

font-family: Verdana, Geneva, sans-serif;

font-size: 22px;

color: #FFF;

text-align: center;

line-height: 20px;

}

#myname {

position: absolute;

top: 300px;

left: 70%;

font-family: Georgia, "Times New Roman", Times, serif;

font-size: 40px;

color: #FFF;

transform: rotate(90deg);

-webkit-transform: rotate(90deg);

white-space: nowrap;

}

#utm {

position: absolute;

top: 20px;

left: 76%;

width: 150px;

height: 60px;

}

**script.js**

**function MD() {**

**this.table = null;**

**this.object = null;**

**}**

**/\* -Form pentru date- \*/**

**MD.prototype.CreazaMatriceaDeIncidenta = function(m, n) {**

**this.table = document.createElement("table");**

**for(var i=0;i<=m;i++)for(var row=this.table.insertRow(-1),j=0;j<=n;j++)row.insertCell(-1).innerHTML=i&&j?"<input onfocus=\"this.select()\" id='"+i+":"+j+"' value=\"0\"/>":i?"u<sub>"+i+"</sub>":j?"x<sub>"+j+"</sub>":" ";**

**};**

**MD.prototype.CreazaMatriceaDeAdiacenta = function(n) {**

**this.table = document.createElement("table");**

**for(var i=0;i<=n;i++)for(var row=this.table.insertRow(-1),j=0;j<=n;j++)row.insertCell(-1).innerHTML=i&&j?"<input onfocus=\"this.select()\" id='"+i+":"+j+"' value=\"0\"/>":i?"x<sub>"+i+"</sub>":j?"x<sub>"+j+"</sub>":" ";**

**};**

**MD.prototype.CreazaListaDeAdiacenta = function() {**

**var table = this.table = document.createElement("table");**

**this.table.insertRow(-1).innerHTML = "<tr><td style=\"width: 20px\"></td><td></td></tr>";**

**this.table.insertRow(-1).innerHTML = "<tr><td>1</td><td><input onfocus=\"this.select()\" style=\"border: none; width: 600px\"></td></tr>";**

**this.table.onkeyup = function(evt) {**

**if (evt.target.tagName == "INPUT") {**

**var p = evt.target.parentElement.parentElement.previousSibling;**

**var n = evt.target.parentElement.parentElement.nextSibling;**

**if ((evt = evt || window.event).keyCode == 13) {**

**if (!n) {**

**var row = table.insertRow(-1);**

**var ID = parseInt(row.previousSibling.children[0].innerHTML);**

**row.insertCell(-1).innerHTML = '<input onfocus=\"this.select()\" id="'+(ID+1)+'" style="border: none; width: 600px">';**

**row.insertCell(0).innerHTML = (ID+1);**

**row.children[1].children[0].select();**

**row.children[1].children[0].scrollIntoView();**

**} else {**

**n.children[1].children[0].select();**

**n.children[1].children[0].scrollIntoView();**

**}**

**}**

**if (evt.keyCode == 8) {**

**if (!evt.target.value) {**

**if (p.children[1].children[0]) {**

**var v = parseInt(evt.target.parentElement.parentElement.children[0].innerHTML), e, l = table.getElementsByTagName("input");**

**for (var i = 0; i < l.length; i++) {**

**e = l[i].value.trim().replace(/ +/g,' ').split(' ');**

**for (var j = 0; j < e.length; j++) {**

**if (parseInt(e[j]) > v){**

**e[j] = parseInt(e[j])-1**

**} else if (parseInt(e[j]) == v) {**

**e[j] = " ";**

**}}**

**l[i].value = e.join(" ").replace(/ +/g,' ').trim()**

**}**

**(p.children[1].children[0]||{}).select()**

**evt.target.parentElement.parentElement.remove()**

**do {**

**n.children[0].innerHTML = parseInt(n.children[0].innerHTML)-1**

**} while (n = n.nextSibling);**

**} }}}}};**

**/\* -Citirea Datelor- \*/**

**MD.prototype.CitesteMatriceaDeAdiacenta = function(){**

**this.object = new Object();**

**var e, l = this.table.getElementsByTagName("tr");**

**for (var i = 1; i < l.length; i++) {**

**this.object[i] = new Array();**

**e = l[i].getElementsByTagName("input");**

**for (var j = 0; j < e.length; j++) {**

**if (e[j].value == 1) {**

**this.object[i].push(j+1)**

**} } }}**

**MD.prototype.CitesteMatriceaDeIncidenta = function(){**

**this.object = new Object();**

**var s, f, e, l = this.table.getElementsByTagName("tr");**

**for (var i = 1; i < this.table.rows[0].cells.length; i++) this.object[i] = new Array();**

**for (var i = 1; i < l.length; i++) {**

**s=null; f=null; e = l[i].getElementsByTagName("input");**

**for (var j = 0; j < e.length; j++) {**

**if (e[j].value == -1) s = j+1;**

**if (e[j].value == 1) f = j+1;**

**if (e[j].value == 2) { this.object[j+1].push(j+1); break }**

**if (s && f) { this.object[s].push(f); break }**

**} }}**

**MD.prototype.CitesteListaDeAdiacenta = function(){**

**this.object = new Object();**

**var e, l = this.table.getElementsByTagName("input");**

**for (var i = 1; i < this.table.rows.length; i++) this.object[i] = new Array();**

**for (var i = 0; i < l.length; i++) {**

**e = l[i].value.trim().replace(/ +/g,' ').split(' ');**

**for (var j = 0; j < e.length; j++) {**

**if (parseInt(e[j]) && this.object[e[j]]) {**

**if (e[j]==0) {**

**break;**

**} else {**

**this.object[i+1].push(parseInt(e[j]))**

**} } } }}**

**/\* -Afisarea Datelor- \*/**

**MD.prototype.AfiseazaMatriceaDeAdiacenta = function(){**

**this.CreazaMatriceaDeAdiacenta(Object.keys(this.object).length)**

**for (var i in this.object) {**

**for (var j = 0; j < this.object[i].length; j++) {**

**this.table.rows[i].cells[this.object[i][j]].children[0].value = 1;**

**} } }**

**MD.prototype.AfiseazaMatriceaDeIncidenta = function(){**

**var c=1,m=0;**

**for (var i in this.object) { m+=this.object[i].length }**

**this.CreazaMatriceaDeIncidenta(m,Object.keys(this.object).length)**

**for (var i in this.object) {**

**for (var j = 0; j < this.object[i].length; j++) {**

**if (this.object[i][j] == i) {**

**this.table.rows[c].cells[this.object[i][j]].children[0].value = 2;**

**} else {**

**this.table.rows[c].cells[i].children[0].value = -1;**

**this.table.rows[c].cells[this.object[i][j]].children[0].value = 1;**

**}**

**c++; } } }**

**MD.prototype.AfiseazaListaDeAdiacenta = function(){**

**this.CreazaListaDeAdiacenta()**

**for (var i in this.object) {**

**if (!this.table.rows[i]) {**

**var row = this.table.insertRow(-1);**

**row.insertCell(-1).innerHTML = '<input onfocus=\"this.select()\" style="border: none; width: 600px">';**

**row.insertCell(0).innerHTML = i;**

**}**

**this.table.rows[i].cells[1].children[0].value = (this.object[i].join(" ") + " 0").trim();**

**}}**

**/\*Dropdown Menu 1 and 2\*/**

**$(document).ready(function() {**

**$("#dropdown\_menu1").click(function() {**

**var menu1 = document.getElementById('first\_menu');**

**$("#first\_menu").css({"left": (menu1.style.left < 0+"%") ? "0%" : "-150%"});**

**$("#second\_menu").css({"left": "-150%"});**

**});**

**$("#dropdown\_menu2").click(function() {**

**var menu2 = document.getElementById('second\_menu');**

**$("#second\_menu").css({"left": (menu2.style.left < 0+"%") ? "0%" : "-150%"});**

**$("#first\_menu").css({"left": "-150%"}); });});**

**index.html**

**<html>**

**<head>**

**<meta charset="utf-8">**

**<title>Brăduleac Vadim - Matematica Discretă LAB. 1</title>**

**<link rel="stylesheet" type="text/css" href="res/style.css">**

**<script type="text/javascript" src="jquery-1.11.1.min.js"></script>**

**<script type="text/javascript" src="res/script.js"></script>**

**</head>**

**<body>**

**<div id="content">**

**<div id="main-container">**

**<div id="MD\_title">Păstrarea Grafului în Memoria Calculatorului</div>**

**<div id="menu\_cont1">**

**<ul id="first\_menu" class="menu m1">**

**<li><a href="#">Matricea de incidență</a></li>**

**<li><a href="#">Matricea de adiacență</a></li>**

**<li><a href="#">Lista de adiacență</a></li>**

**</ul>**

**</div>**

**<div id="menu\_cont2">**

**<ul id="second\_menu" class="menu m2">**

**<li><a href="#">Matricea de incidență</a></li>**

**<li><a href="#">Matricea de adiacență</a></li>**

**<li><a href="#">Lista de adiacență</a></li>**

**</ul>**

**</div>**

**<div id="menu\_cont3">**

**</div>**

**<center>**

**<div id="dropdown\_menu1">**

**<span id="data">Introducerea Datelor</span>**

**</div>**

**<div id="dropdown\_menu2">**

**<span id="data">Vizualizarea Datelor</span>**

**</div>**

**<br>**

**<div id="Input"></div>**

**<div id="table"></div>**

**<br>**

**<input id="Save" style="width:200px; cursor: pointer; color: #333;border: 1px solid #ccc; font-family: Verdana, Geneva, sans-serif font-weight: bold; display: none" type="Button" value="Salveaza"/>**

**</center>**

**</div>**

**</div>**

**<div id="myname">UTM - Brăduleac Vadim AI-151</div>**

**<img src="res/utm.gif" id="utm">**

**</body>**

**</html>**

**<script type="text/javascript">**

**document.body.ondragstart = function(){return false};**

**obj = new MD();**

**item = document.querySelectorAll(".menu.m1 a")**

**item[0].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none"; table.innerHTML = ""**

**Input.innerHTML = 'm:<input class="box1" onfocus="this.select()">n:<input id="RMIn" class="box2" onfocus="this.select()"> - <button style="margin-bottom: 15px; cursor: pointer">Genereaza Datele </button>'**

**Input.getElementsByTagName("button")[0].onclick = function() {**

**table.innerHTML = ""**

**var e = Input.getElementsByTagName("input")**

**obj.CreazaMatriceaDeIncidenta(parseInt(e[0].value),parseInt(e[1].value))**

**table.appendChild(obj.table)**

**}**

**Save.onclick = function(){ obj.CitesteMatriceaDeIncidenta() }**

**Save.value = "Salvează Datele"**

**Save.style.display=""**

**}**

**item[1].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none"; table.innerHTML = ""**

**Input.innerHTML = 'n:<input id="RMAn" onfocus="this.select()"> - <button style="margin-bottom: 15px">Genereaza Datele</button>'**

**Input.getElementsByTagName("button")[0].onclick = function() {**

**table.innerHTML = ""**

**var e = Input.getElementsByTagName("input")**

**obj.CreazaMatriceaDeAdiacenta(parseInt(e[0].value))**

**table.appendChild(obj.table)**

**}**

**Save.onclick = function(){ obj.CitesteMatriceaDeAdiacenta() }**

**Save.value = "Salvează Datele"**

**Save.style.display=""**

**}**

**item[2].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none"; table.innerHTML = ""; Input.innerHTML = ''**

**obj.CreazaListaDeAdiacenta()**

**table.appendChild(obj.table)**

**obj.table.className = "list"**

**Save.onclick = function(){ obj.CitesteListaDeAdiacenta() }**

**Save.value = "Salvează Datele"**

**Save.style.display=""**

**}**

**/\* -Afisarea- \*/**

**item = document.querySelectorAll(".menu.m2 a")**

**item[0].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none";**

**Input.innerHTML = table.innerHTML = ""**

**obj.AfiseazaMatriceaDeIncidenta()**

**table.appendChild(obj.table)**

**Save.onclick = function(){ obj.CitesteMatriceaDeIncidenta() }**

**Save.value = "Modifică Datele"**

**Save.style.display=""**

**}**

**item[1].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none";**

**Input.innerHTML = table.innerHTML = ""**

**obj.AfiseazaMatriceaDeAdiacenta()**

**table.appendChild(obj.table)**

**Save.onclick = function(){ obj.CitesteMatriceaDeAdiacenta() }**

**Save.value = "Modifică Datele"**

**Save.style.display=""**

**}**

**item[2].onclick = function(e){**

**menuselect(e.target.parentElement)**

**Save.style.display="none";**

**Input.innerHTML = table.innerHTML = ""**

**obj.AfiseazaListaDeAdiacenta()**

**obj.table.className = "list"**

**table.appendChild(obj.table)**

**Save.onclick = function(){ obj.CitesteListaDeAdiacenta() }**

**Save.value = "Modifică Datele"**

**Save.style.display=""**

**}**

**function menuselect(e){var c=document.querySelector(".menu li.selected");c&&(c.className=""),e.className="selected"}**

**</script>**



**Concluzie** : Elaborînd această lucrare am însușit procedura introducerii unui graf în memoria calculatorului în formă de matrice de incidenţă, matrice de adiacenţă şi listă de adiacenţă cu posibilităţi de analiză a corectitudinii.Am elaborat proceduri de transformare dintr-o formă de reprezentare în alta.Și cu ajutorul acestor proceduri am efectuat programul care permite: introducerea grafului reprezentat sub oricare din cele trei forme cu posibilităţi de corecţie a datelor.