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| ***Инв. № Подп. и дата Взам. инв. № Инв. № дубл. Подп. и дата*** |

**ПРАВИТЕЛЬСТВО РОССИЙСКОЙ ФЕДЕРАЦИИ НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ «ВЫСШАЯ ШКОЛА ЭКОНОМИКИ»**

Факультет компьютерных наук

Департамент программной инженерии

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| «\_\_\_» \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2020 г. | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ В.В. Шилов |
|  | «\_\_\_» \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2020 г. |

**WEB ПРИЛОЖЕНИЕ ДЛЯ ВИЗУАЛИЗАЦИИ АЛГОРИТМА АХО-КОРАСИК**

**Текст программы**

**ЛИСТ УТВЕРЖДЕНИЯ**

**RU.17701729.04.13-01 01-1-ЛУ**

Исполнитель

студент группы БПИ183

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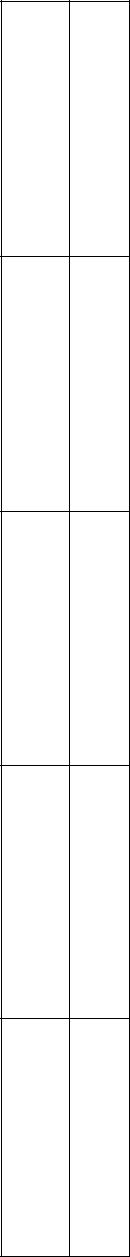
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**Москва 2020**

УТВЕРЖДЕН

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**WEB ПРИЛОЖЕНИЕ ДЛЯ ВИЗУАЛИЗАЦИИ АЛГОРИТМА АХО-КОРАСИК**

**Текст программы**

**RU.17701729.04.13-01 01-1-ЛУ**

**Листов 32**

**Москва 2020**

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# **Аннотация**

В данном программном документе представлен текст программы «Web Приложение для визуализации алгоритма Ахо-Корасик». В разделе ”Текст программы” находится текст про-

граммы, распределенный по файлам.

Оформление данного документа произведено по требованиям ЕСПД (ГОСТ 19.102-

771, ГОСТ 19.103-772, ГОСТ 19.104-783, ГОСТ 19.105-784, ГОСТ 19.106-785, ГОСТ 19.401-786

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1. **СОДЕРЖАНИЕ**

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* 1. **index.html**

|  |
| --- |
| <!DOCTYPE html> |
|  | <html lang="en"> |
|  | <head> |
|  | <!--<base href="content/"> --> |
|  | <meta charset="UTF-8"> |
|  | <title>Aho-Korasik</title> |
|  | <link rel="stylesheet" type="text/css" href="styles.css"/> |
|  | <script type="text/javascript" src="scripts.js" ></script> |
|  | </head> |
|  |  |
|  | <body> |
|  |  |
|  | <table style="min-width: 1200px; width: 100%; height: 100%; padding-left: 15px; padding-right: 15px; border-collapse: collapse; table-layout: fixed;"> <!-- border-spacing: 25px 10px; --> |
|  | <tr> |
|  | <th colspan="3"> |
|  | <h1>Aho-Korasik algo</h1> |
|  | </th> |
|  | </tr> |
|  | <tr> |
|  | <td style="width: 30%; vertical-align: top;"> |
|  | <h2>Искомые подстроки</h3> |
|  | </td> |
|  | <td colspan="2"> |
|  | <h2>Строка для поиска</h3> |
|  | </td> |
|  | </tr> |
|  | <tr> |
|  | <td style="width: 30%; vertical-align: bottom;"> |
|  | <div id="substrings" class="scrolbars" style="font-size: 2.5em; border-width: 1px; border-style: solid;"> |
|  | <!-- <div>aba</div> |
|  | <div>cab</div> |
|  | <div>bac</div> |
|  | <div>abacab</div> --> |
|  | </div> |
|  | </td> |
|  | <td colspan="2" style="vertical-align: bottom;"> |
|  | <div id="string" class="scrolbars" style="font-size: 2.5em; border-width: 1px; border-style: solid;"> |
|  | <!-- abacabadaba --> |
|  | </div> |
|  | </td> |
|  | </tr> |
|  | <!-- </table> |
|  | 6  RU.17701729. 04.13-01 01-1    <hr style="width:100%;text-align:left;margin-left:0"> |
|  | <table style="width: 100%; height: 100%; padding-left: 15px; padding-right: 15px; border-collapse: separate; border-spacing: 25px 10px; table-layout: fixed;"> --> |
|  | <tr id="inputs" style="display: ;"> |
|  | <td colspan="3" id="ressubstrtd" style="display: ; width: 35%;" > |
|  | <h3> |
|  | Введите искомые подстроки, каждую на новой строке |
|  | </h3> |
|  | <textarea name="ressubstr" id="ressubstr" value="" style="width: 100%"></textarea> |
|  | <br/> |
|  | <button onclick="fillACB()">Хороший случай</button> |
|  | <button onclick="fillACM()">Средний случай</button> |
|  | <button onclick="fillACW()">Плохой случай</button> |
|  | <br/> |
|  | <button onclick="fillAC()">Следующий шаг</button> |
|  | </td> |
|  | <td colspan="3" id="resstrtd" style="display: none; width: 35%;"> |
|  | <h3> |
|  | Введите строку для поиска подстрок |
|  | </h3> |
|  | <textarea name="resstr" id="resstr" value="" style="width: 100%"></textarea> |
|  | <br/> |
|  | <button onclick="fillSB()">Хороший случай</button> |
|  | <button onclick="fillSM()">Средний случай</button> |
|  | <button onclick="fillSW()">Плохой случай</button> |
|  | <br/> |
|  | <button onclick="changeSS()">Предыдущий шаг</button> |
|  | <button onclick="startVis()">Перейти к визуализации</button> |
|  | </td> |
|  | </tr> |
|  | <tr id="controls\_and\_tree" style="display: none"> |
|  | <td style="width: 30%; border-right-style: solid; border-top-style: solid;border-bottom-style: solid;"> |
|  | <div class="scrolbars"> |
|  | 7  RU.17701729. 04.13-01 01-1    <table id="tree" align="center" style="width: 80%; border-spacing: 10px; border-width: 1px;"> |
|  |  |
|  | </table> |
|  | </div> |
|  | </td> |
|  | <td id="algoFind" style="width: 35%; vertical-align: top; border-left-style: solid; |
|  | border-top-style: solid; border-bottom-style: solid;font-size: x-large;"> |
|  | <div>Aho\_Korasik(substr,str):</div> |
|  | <div>BuildTreeFromStrings(substr)</div> |
|  | <br/> |
|  | <div>v = 0</div> |
|  | <div>for (i in str):</div> |
|  | <div>&nbsp&nbsp v = go(v, nextSymb)</div> |
|  | <div>&nbsp&nbsp pv = v</div> |
|  | <div>&nbsp&nbsp while(pv != root):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp if(checkIsList(pv)):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp&nbsp&nbsp addRes(pv)</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp pv = getLink(pv)</div> |
|  | </td> |
|  | <td id="algoFunc" style="vertical-align: top; border-top-style: solid;border-bottom-style: solid;font-size: x-large;"> |
|  | <div>go(v,c):</div> |
|  | <div>&nbsp&nbsp if(v.next[c] != NULL):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp return v.next[c]</div> |
|  | <div>&nbsp&nbsp if(v == root):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp return root</div> |
|  | <div>&nbsp&nbsp return go(getLink(v),c)</div> |
|  | <br/> |
|  | <div>getLink(v):</div> |
|  | <div>&nbsp&nbsp if(v.link == NULL):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp if(v == root):</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp&nbsp&nbsp v.link = root</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp else:</div> |
|  | <div>&nbsp&nbsp&nbsp&nbsp&nbsp&nbsp v.link = go(getLink(v.parent),v.symb)</div> |
|  | <div>&nbsp&nbsp return v.link</div> |
|  | <br/> |
|  | </td> |
|  | 8  RU.17701729. 04.13-01 01-1    </tr> |
|  | <tr id="visualizing" style="display: none"> |
|  | <td style="vertical-align: top; border-collapse: 15px;"> |
|  | <div id="progressbar"> |
|  | <div></div> |
|  | </div> |
|  | <div id="progress" style="text-align: center;"></div> |
|  | <br/> |
|  | <div style="display: table; align-items: center; width: 100%;"> |
|  | <button style="display: table-cell; width: 50%;" onclick="previousState()">Предыдущее действие</button> |
|  | <button style="display: table-cell; width: 50%;" onclick="nextState()">Следующее действие</button> |
|  | </div> |
|  | <div style="display: table; align-items: center; width: 100%;"> |
|  | <button style="display: table-cell; width: 50%;" onclick="changeS(); changeSS()">Изменить искомые подстроки</button> |
|  | <button style="display: table-cell; width: 50%;" onclick="changeS()">Изменить строку для поиска</button> |
|  | </div> |
|  | </td> |
|  | <td colspan="2" style="vertical-align: top; font-size: x-large;"> |
|  | <h3> |
|  | Текущая операция |
|  | </h3> |
|  | <div id="operation"> |
|  |  |
|  | </div> |
|  | </td> |
|  | </tr> |
|  |  |
|  | </table> |
|  |  |
|  |  |
|  | </body> |

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**1.2 styles.css**

|  |
| --- |
| body{ |
|  | border-style: solid; |
|  | margin: 0 0 0 0; |
|  | border-width: 26px; |
|  | background-color: #eee; |
|  | } |
|  |  |
|  | td{ |
|  | padding: 10px; |
|  | } |
|  |  |
|  | #progressbar { |
|  | background-color: black; |
|  | border-radius: 13px; |
|  | /\* (height of inner div) / 2 + padding \*/ |
|  | padding: 3px; |
|  | } |
|  |  |
|  | #progressbar>div { |
|  | background-color: orange; |
|  | /\* Adjust with JavaScript \*/ |
|  | border-radius: 8px; |
|  | height: 20px; |
|  | width: 0%; |
|  | } |
|  |  |
|  | /\*div > ul:hover{ |
|  | overflow-y: auto; |
|  | overflow-x: hidden; |
|  | -webkit-overflow-scrolling: touch; |
|  | -moz-overflow-scrolling: touch; |
|  | -ms-overflow-scrolling: touch; |
|  | -o-overflow-scrolling: touch; |
|  | overflow-scrolling: touch; |
|  | } |
|  | div > ul::-webkit-scrollbar { |
|  | -webkit-appearance: none; |
|  | width: 7px; |
|  | } |
|  | div > ul::-webkit-scrollbar-thumb { |
|  | border-radius: 2px; |
|  | background-color: rgba(0,0,0,0.5); |
|  | -webkit-box-shadow: 0 0 1px rgba(255,255,255,0.5); |
|  | }\*/ |
|  |  |
|  | .scrolbars{ |
|  | overflow-x: auto; |
|  | -webkit-overflow-scrolling: touch; |
|  | -moz-overflow-scrolling: touch; |
|  | -ms-overflow-scrolling: touch; |
|  | -o-overflow-scrolling: touch; |
|  | 10  RU.17701729. 04.13-01 01-1  overflow-scrolling: touch; |
|  | } |
|  |  |
|  | button{ |
|  | padding: 10px 35px 10px 35px; |
|  | font-size: 1.2em; |
|  | border-style: solid; |
|  | border-width: 1px; |
|  | border-radius: 5px; |
|  | border-color: #14af21; |
|  | background-color: #068a11; |
|  | color: #fff; |
|  | cursor: pointer; |
|  | } |
|  |  |
|  | button:hover{ |
|  | background-color: #05800d; |
|  | } |
|  |  |
|  | button:active{ |
|  | box-shadow: 0 3px rgb(33,147,90) inset; |
|  | } |
|  |  |
|  | textarea{ |
|  | height: 100px; |
|  | background-color: #ffffff4d; |
|  | } |

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**1.2 scripts.js**

|  |
| --- |
| class AhoCorasik |
|  | { |
|  | constructor(which, nmax = 1000) // (IEnumerable which, int nmax = 1000) |
|  | { |
|  | this.t = [] |
|  | this.sz = 0; |
|  | this.stringlen = 0; |
|  | this.init(nmax); |
|  | for(let i = 0; i < which.length; ++i) |
|  | { |
|  | this.add\_string(which[i]); |
|  | this.stringlen++; |
|  | } |
|  | this.substrings = which; |
|  | this.statusarr = []; |
|  | this.string = ""; |
|  | this.result = []; |
|  | this.vert = [] |
|  | } |
|  |  |
|  | findMaxMoveStr(){ |
|  | this.statusarr[this.statusarr.length - 1]["notmovestr"] = 1 |
|  | for (var i = this.statusarr.length - 1; i >= 0; i--) { |
|  | if(this.statusarr[i]["try\_to\_go\_next"]){ |
|  | this.statusarr[this.statusarr.length - 1]["try\_to\_go\_next"] = this.statusarr[i]["try\_to\_go\_next"] |
|  | return ["try\_to\_go\_next",this.statusarr[i]["try\_to\_go\_next"]] |
|  | } |
|  | if(this.statusarr[i]["result"]){ |
|  | this.statusarr[this.statusarr.length - 1]["result"] = this.statusarr[i]["result"] |
|  | this.statusarr[this.statusarr.length - 1]["pos"] = this.statusarr[i]["pos"] |
|  | return ["result",this.statusarr[i]["result"],"pos",this.statusarr[i]["pos"]] |
|  | 12  RU.17701729. 04.13-01 01-1  } |
|  | if(this.statusarr[i]["id"]){ |
|  | this.statusarr[this.statusarr.length - 1]["id"] = this.statusarr[i]["id"] |
|  | return ["id",this.statusarr[i]["id"]] |
|  | } |
|  | } |
|  | } |
|  |  |
|  | // get t(){ |
|  | // return t; |
|  | // } |
|  | // set t(val){ |
|  | // t = val; |
|  | // } |
|  |  |
|  | // get sz(){ |
|  | // return sz; |
|  | // } |
|  | // set sz(val){ |
|  | // sz = val; |
|  | // } |
|  |  |
|  | // findInString(s, w) // (string s, string[] w) |
|  | // { |
|  | // let i = 0; |
|  | // for (i = 0; i < w.length; i++) |
|  | // { |
|  | // if (s == w[i]) return i; |
|  | // } |
|  | // return i; |
|  | // } |
|  |  |
|  | /// <summary> |
|  | /// Find substring in string |
|  | /// </summary> |
|  | /// <param name="where"></param> |
|  | /// <returns></returns> public vector<pair<vector<int>,string>> |
|  | find(where) // (string where) |
|  | { |
|  | this.statusarr = []; |
|  | this.string = where; |
|  | this.result = []; |
|  | let v = 0; |
|  | let n = [] //new vector<pair<vector<int>, string>>(); |
|  | 13  RU.17701729. 04.13-01 01-1    for(let i = 0; i < where.length; i++) |
|  | { |
|  | // this.get\_link(v) |
|  | // console.log(i, where[i],this.t[v].stringid, this.t[v].stringelid) |
|  | // console.log(this.statusarr) |
|  | // console.log(" ",this.t[v].link,this.t[this.t[v].link].stringid,this.t[this.t[v].link].stringelid) |
|  | // for(let ii = 0; ii < 256; ++ii){ |
|  | // if(this.t[v].go[String.fromCharCode(ii)] != -1){ |
|  | // console.log("\t",String.fromCharCode(ii),this.t[this.t[v].go[String.fromCharCode(ii)]].stringid,this.t[this.t[v].go[String.fromCharCode(ii)]].stringelid) |
|  | // } |
|  | // } |
|  | // console.log(this.t[v].go) |
|  | // console.log(v, where[i]) |
|  | v = this.go(v, where[i]); |
|  | this.statusarr.push({"vertex":this.t[v],"id":i}) |
|  | // console.log(v) |
|  | let pv = v; |
|  | while(pv != 0) { |
|  | this.statusarr.push({"check\_vertex":this.t[v]}) |
|  | this.findMaxMoveStr() |
|  | if (this.t[pv].leaf && this.t[pv].leafs.length>0) |
|  | { |
|  | this.statusarr.push({"result":this.t[pv].leafs,"pos":i - this.t[pv].leafs.length + 1}) |
|  | let j = 0; // int |
|  | let flag = true; // bool |
|  | for(j = 0; j < n.length; ++j) |
|  | { |
|  | if(n[j]["second"] == this.t[pv].leafs) |
|  | { |
|  | n[j]["first"].push(i - this.t[pv].leafs.length + 1); |
|  | flag = false; |
|  | break; |
|  | 14  RU.17701729. 04.13-01 01-1  } |
|  | } |
|  | if (flag) { |
|  | n.push({"first":[], "second":""}); |
|  | j = n.length - 1; |
|  | //n[j] = new pair<vector<int>, string>(); |
|  | n[j]["second"] = this.t[pv].leafs; |
|  | //n[j].setsecond(t[pv].leafs); |
|  | //vector<int> \_ = new vector<int>(); |
|  | n[j]["first"] = [];//\_; |
|  | //n[j].setfirst(\_); |
|  | n[j]["first"].push(i - this.t[pv].leafs.length + 1); |
|  | } |
|  | } |
|  | pv = this.get\_link(pv) |
|  | } |
|  | } |
|  | this.result = n |
|  | return n; |
|  | } |
|  |  |
|  | // /// <summary> |
|  | // /// Find substring in collection string |
|  | // /// </summary> |
|  | // /// <param name="ii">String</param> |
|  | // /// <param name="isienumerable">Fictive parameter</param> |
|  | // /// <returns></returns> |
|  | // find(ii, isarr) // public IEnumerable<vector<pair<vector<int>, string>>> (IEnumerable ii, bool isienumerable) |
|  | // { |
|  | // int v = 0; |
|  | // int iin = -1; |
|  | // vector<pair<vector<int>, string>> n = new vector<pair<vector<int>, string>>(); |
|  | // foreach (string where in ii) |
|  | // { |
|  |  |
|  | // ++iin; |
|  | // for (let i = 0; i < where.Length; i++) |
|  | // { |
|  | // v = go(v, where[i]); |
|  | // if (t[v].leaf) |
|  | // { |
|  | 15  RU.17701729. 04.13-01 01-1    // int j = 0; |
|  | // bool flag = true; |
|  | // for (j = 0; j < n.size(); ++j) |
|  | // { |
|  | // if (n[j].second == t[v].leafs) |
|  | // { |
|  | // n[j].first.append(i - t[v].leafs.Length + 1); |
|  | // } |
|  | // } |
|  | // if (flag) |
|  | // { |
|  | // n.append(new pair<vector<int>, string>()); |
|  | // j = n.size() - 1; |
|  | // //n[j] = new pair<vector<int>, string>(); |
|  | // n[j].second=t[v].leafs; |
|  | // n[j].first = new vector<int>(); |
|  | // n[j].first.append(i - t[v].leafs.Length + 1); |
|  | // } |
|  | // } |
|  | // } |
|  | // yield return n; |
|  | // } |
|  | // } |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | build(nmax = 1000) // (int nmax = 1000) |
|  | { |
|  | this.t = []; |
|  | for(let i = 0; i < nmax + 1; i++) |
|  | { |
|  | this.t.push(new vertex()); |
|  | } |
|  | } |
|  | // vertex[] t; |
|  | // int sz; |
|  |  |
|  | memset() // (out int[] p, int \_, int[] \_\_) |
|  | { |
|  | let p = []; |
|  | for (let i = 0; i < 256; ++i) |
|  | { |
|  | p[String.fromCharCode(i)] = -1; |
|  | 16  RU.17701729. 04.13-01 01-1    } |
|  | return p; |
|  | } |
|  |  |
|  | init(nmax = 1000) // (int nmax = 1000) |
|  | { |
|  | this.build(nmax); |
|  | this.t[0].p = -1; |
|  | this.t[0].link = -1; |
|  | //t[0].myadress = 0; |
|  | this.t[0].next = this.memset(); |
|  | this.t[0].go = this.memset(); |
|  | this.sz = 1; |
|  | } |
|  |  |
|  | add\_string(s) { // (string s) |
|  | console.log("add string " + s) |
|  | let v = 0; |
|  | for (let i = 0; i < s.length; ++i) { |
|  | let c = s[i]; // char |
|  | if (this.t[v].next[c] == -1) { |
|  | this.t[this.sz].next = this.memset(); //ERROR |
|  | this.t[this.sz].go = this.memset(); |
|  | this.t[this.sz].link = -1; |
|  | this.t[this.sz].p = v; |
|  | this.t[this.sz].pch = c; |
|  | this.t[this.sz].stringid = this.stringlen; |
|  | this.t[this.sz].stringelid = i; |
|  | this.t[this.sz].id = this.sz; |
|  | this.t[v].next[c] = this.sz++; |
|  | } |
|  | v = this.t[v].next[c]; |
|  | } |
|  | this.t[v].leaf = true; |
|  | this.t[v].leafs = s; |
|  | } |
|  |  |
|  | //int go(int v, char c); |
|  |  |
|  | get\_link(v) // (int v) |
|  | { |
|  | this.statusarr.push({"get\_link":this.t[v]}) |
|  | this.findMaxMoveStr() |
|  | if (this.t[v].link == -1) |
|  | 17  RU.17701729. 04.13-01 01-1    if (v == 0 || this.t[v].p == 0){ |
|  | this.t[v].link = 0; |
|  | this.t[v].linkFixStep = this.statusarr.length - 1 |
|  | } |
|  | else{ |
|  | this.statusarr.push({"update\_link\_from\_parent":this.t[v]}) |
|  | this.findMaxMoveStr() |
|  | this.t[v].link = this.go(this.get\_link(this.t[v].p), this.t[v].pch); |
|  | this.t[v].linkFixStep = this.statusarr.length - 1 |
|  | } |
|  | this.statusarr.push({"return\_link":this.t[v]}) |
|  | this.findMaxMoveStr() |
|  | return this.t[v].link; |
|  | } |
|  |  |
|  | go(v, c) // (int v, char c) |
|  | { |
|  | this.statusarr.push({"try\_to\_go\_next":this.t[v],"symb":c}) |
|  | if (this.t[v].go[c] == -1) |
|  | if (this.t[v].next[c] != -1) |
|  | this.t[v].go[c] = this.t[v].next[c]; |
|  | else{ |
|  | this.statusarr.push({"go\_by\_link":this.t[v]}) |
|  | this.findMaxMoveStr() |
|  | this.t[v].go[c] = v == 0 ? 0 : this.go(this.get\_link(v), c); |
|  | } |
|  | return this.t[v].go[c]; |
|  | } |
|  |  |
|  |  |
|  | countpos(v = 0,p = 0,h = 0){ |
|  | if(v == -1) return 0 |
|  | this.vert.push(v) |
|  | // console.log(h,v,this.t[v].pch) |
|  | this.t[v].depth = h |
|  | this.t[v].startpos = p |
|  | this.t[v].width = 0 |
|  | for (var i = 0; i < 256; i++) { |
|  | console.log(v,".width now = ",this.t[v].width) |
|  | this.t[v].width += this.countpos(this.t[v].next[String.fromCharCode(i)],p+this.t[v].width,h+1) |
|  | } |
|  | 18  RU.17701729. 04.13-01 01-1    this.t[v].width = this.t[v].width == 0?1:this.t[v].width |
|  | return this.t[v].width |
|  | } |
|  |  |
|  | } |
|  |  |
|  | class vertex |
|  | { |
|  | constructor() |
|  | { |
|  | this.next = []; |
|  | this.leaf = true; |
|  | this.leafs = ""; |
|  | this.p = 0; |
|  | this.pch = ''; |
|  | this.link = 0; |
|  | this.go = []; |
|  | this.stringid = -1; |
|  | this.stringelid = -1; |
|  |  |
|  | this.width = -1; |
|  | this.depth = -1; |
|  | this.startpos = -1; |
|  | this.shift = -1; |
|  | this.id = 0; |
|  | this.linkFixStep = -1; |
|  | } |
|  | // public int[] next; //adress |
|  | // public bool leaf; |
|  | // public string leafs; |
|  | // public int p; |
|  | // public char pch; |
|  | // public int link; |
|  | // public int[] go; //adress |
|  | // //public int myadress; |
|  | } |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  | function test(strok = "abacabadabacab", strarr = ["aba","cab","bac","abacab"]){ |
|  | // let ac = new AhoCorasik(strarr) |
|  | // // console.log(ac.t) |
|  | // console.log(ac.find(strok)) |
|  |  |
|  |  |
|  | } |
|  |  |
|  |  |
|  | let ahoCorasik  18  RU.17701729. 04.13-01 01-1 |
|  | let state = 0 |
|  | let ressubstr = [] |
|  | let resstr = "" |
|  | // let markedSubStr = [] |
|  | let nowindex = 0 |
|  |  |
|  | function setProgress(v){ |
|  | document.getElementById("progressbar").getElementsByTagName("div")[0].style.width=`${v}%` |
|  | document.getElementById("progress").innerHTML = `${state} / ${ahoCorasik.statusarr.length}` |
|  | } |
|  |  |
|  | function selectSymbolStr(k,color,n = 1, color2 = ""){ |
|  | if(color2.length == 0) color2 = color |
|  | let src = resstr |
|  | let res = "<div>" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i<k || i >= k+n) res += src[i] == " "?"&nbsp":src[i] |
|  | else if(i!=k+n-1) res += `<span style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | else res += `<span style="background-color: ${color2}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | } |
|  | res+="</div>" |
|  | document.getElementById("string").innerHTML = res |
|  | } |
|  |  |
|  | let oldv = [] |
|  |  |
|  | function fixtree(){ |
|  | makeTable() |
|  | for (var i = 0; i < oldv.length; i++) { |
|  | document.getElementById("tree").getElementsByTagName("tr")[oldv[i].depth].getElementsByTagName("td")[oldv[i].shift].style.backgroundColor = "" |
|  | } |
|  | oldv = [] |
|  |  |
|  | for (var j = 0; j < ressubstr.length; j++) { |
|  | let src = ressubstr[j] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | res += (src[i] == " "?"&nbsp":src[i]) |
|  | 19  RU.17701729. 04.13-01 01-1    } |
|  | // console.log(j,res) |
|  | document.getElementById("substrings").getElementsByTagName("div")[j].innerHTML = res |
|  | } |
|  | } |
|  |  |
|  | function selectSymbolSubStr(v,color){ |
|  | fixtree() |
|  | let n = v.stringid |
|  | let k = v.stringelid |
|  | console.log(n,k,v.depth, v.shift) |
|  | k = k+1 |
|  | // console.log(n,k) |
|  | if(n === -1){ |
|  | for (var j = 0; j < ressubstr.length; j++) { |
|  | let src = ressubstr[j] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else res += `<spam style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</spam>` |
|  | } |
|  | // console.log(j,res) |
|  | document.getElementById("substrings").getElementsByTagName("div")[j].innerHTML = res |
|  | } |
|  | } |
|  | else{ |
|  | let src = ressubstr[n] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else res += `<spam style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</spam>` |
|  | } |
|  | document.getElementById("substrings").getElementsByTagName("div")[n].innerHTML = res  20  RU.17701729. 04.13-01 01-1 |
|  | } |
|  | document.getElementById("tree").getElementsByTagName("tr")[v.depth].getElementsByTagName("td")[v.shift].style.backgroundColor = "rgba(230, 19, 19, 0.64)" |
|  | oldv.push(v) |
|  | } |
|  |  |
|  | function selectSymbolSubStrP(v,v2,color, color2){ |
|  | fixtree() |
|  | let n = v.stringid |
|  | let k = v.stringelid |
|  | let n2 = v2.stringid |
|  | let k2 = v2.stringelid |
|  | k = k+1 |
|  | k2 = k2+1 |
|  | if(n == n2){ |
|  | if(n == -1){ |
|  | for (var j = 0; j < ressubstr.length; j++) { |
|  | let src = ressubstr[j] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else res += `<span style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | } |
|  | document.getElementById("substrings").getElementsByTagName("div")[j].innerHTML = res |
|  | } |
|  | } |
|  | else{ |
|  | let src = ressubstr[n] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k && i!=k2) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else if(i==k) res += `<span style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | else res += `<span style="background-color: ${color2}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | }  21  RU.17701729. 04.13-01 01-1 |
|  | document.getElementById("substrings").getElementsByTagName("div")[n].innerHTML = res |
|  | } |
|  | } |
|  | else{ |
|  | if(n == -1 || n2 == -1){ |
|  | for (var j = 0; j < ressubstr.length; j++) { |
|  | let src = ressubstr[j] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if((i!=k && n==-1) || (i!=k2 && n2==-1)) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else if(n == -1 && i==k) res += `<span style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | else if(n2 == -1 && i==k2) res += `<span style="background-color: ${color2}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | } |
|  | document.getElementById("substrings").getElementsByTagName("div")[j].innerHTML = res |
|  | } |
|  | } |
|  | if(n != -1){ |
|  | let src = ressubstr[n] |
|  | let res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k) res += (src[i] == " "?"&nbsp":src[i]) |
|  | else res += `<span style="background-color: ${color}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | } |
|  | document.getElementById("substrings").getElementsByTagName("div")[n].innerHTML = res |
|  | } |
|  | if(n2 != -1){ |
|  | src = ressubstr[n2] |
|  | res = "" |
|  | for (var i = 0; i < src.length; i++) { |
|  | if(i!=k2) res += (src[i] == " "?"&nbsp":src[i])  22  RU.17701729. 04.13-01 01-1 |
|  | else res += `<span style="background-color: ${color2}">${src[i] == " "?"&nbsp":src[i]}</span>` |
|  | } |
|  | document.getElementById("substrings").getElementsByTagName("div")[n2].innerHTML = res |
|  | } |
|  | } |
|  | document.getElementById("tree").getElementsByTagName("tr")[v.depth].getElementsByTagName("td")[v.shift].style.backgroundColor = color |
|  | oldv.push(v) |
|  | if(v2.id!=v.id){ |
|  | document.getElementById("tree").getElementsByTagName("tr")[v2.depth].getElementsByTagName("td")[v2.shift].style.backgroundColor = color2 |
|  | oldv.push(v2) |
|  | } |
|  | } |
|  |  |
|  | const makeResSubStr = (arr)=>{ |
|  | res = "" |
|  | for (var i = 0; i < arr.length; i++) { |
|  | res += `<div>${arr[i]}</div>\n` |
|  | } |
|  | return res |
|  | } |
|  |  |
|  | function changeSS(){ |
|  | document.getElementById("ressubstrtd").style.display = "" |
|  | document.getElementById("resstrtd").style.display = "none" |
|  | } |
|  |  |
|  | let table = [] |
|  | let tablerows = [] |
|  |  |
|  | function makeTable(){ |
|  | table = [] |
|  | tablerows = [] |
|  | let maxn = 0 |
|  | for (var j = 0; j < ahoCorasik.vert.length; j++) { |
|  | let i = ahoCorasik.vert[j] |
|  | if(!table[ahoCorasik.t[i].depth]){ |
|  | console.log("Add row by  23  RU.17701729. 04.13-01 01-1  ",i,ahoCorasik.t[i].pch,ahoCorasik.t[i].depth) |
|  | if(ahoCorasik.t[i].depth > maxn) |
|  | maxn = ahoCorasik.t[i].depth |
|  | table[ahoCorasik.t[i].depth] = 0 |
|  | tablerows[ahoCorasik.t[i].depth] = "" |
|  | } |
|  | if(ahoCorasik.t[i].startpos > table[ahoCorasik.t[i].depth]){ |
|  | // console.log("AAA",ahoCorasik.t[i].id,ahoCorasik.t[i].pch) |
|  | tablerows[ahoCorasik.t[i].depth] += `<td colspan="${ahoCorasik.t[i].startpos - table[ahoCorasik.t[i].depth]}" style="border-width: 0px; border-style: none; "></td>` |
|  | table[ahoCorasik.t[i].depth] += ahoCorasik.t[i].startpos - table[ahoCorasik.t[i].depth] |
|  | } |
|  | ahoCorasik.t[i].shift = table[ahoCorasik.t[i].depth] |
|  | table[ahoCorasik.t[i].depth] += ahoCorasik.t[i].width |
|  | tablerows[ahoCorasik.t[i].depth] += `<td colspan="${ahoCorasik.t[i].width}" style="border-width: 1px;border-style: solid; ">${i}:'${ahoCorasik.t[i].pch}'<br/>l:${(ahoCorasik.t[i].link==-1 || ahoCorasik.t[i].linkFixStep > state)?(i==0?0:"N"):ahoCorasik.t[i].link}</td>` |
|  | } |
|  |  |
|  | let res = "" |
|  | for (var i = 0; i < maxn+1; i++) { |
|  | res += `<tr align="center">${tablerows[i]}</tr>` |
|  | } |
|  | document.getElementById("tree").innerHTML = res |
|  |  |
|  | } |
|  |  |
|  | function fillACB(){ |
|  | document.getElementById("ressubstr").value = "aba" |
|  | } |
|  |  |
|  | function fillACM(){ |
|  | document.getElementById("ressubstr").value = "aba\ncaba" |
|  | } |
|  |  |
|  | function fillACW(){ |
|  | document.getElementById("ressubstr").value = `c |
|  | cc |
|  | ccc |
|  | cccc |
|  | ccccc |
|  | Cccccc  24  RU.17701729. 04.13-01 01-1 |
|  | ccccccc |
|  | cccccccc` |
|  | } |
|  |  |
|  | function fillSB(){ |
|  | document.getElementById("resstr").value = "aba" |
|  | } |
|  |  |
|  | function fillSM(){ |
|  | document.getElementById("resstr").value = "abacabadaba" |
|  | } |
|  |  |
|  | function fillSW(){ |
|  | document.getElementById("resstr").value = "cccccccc" |
|  | } |
|  |  |
|  | function fillAC(){ |
|  | ressubstr = document.getElementById("ressubstr").value.split('\n') |
|  | console.log(ressubstr) |
|  | ahoCorasik = new AhoCorasik(ressubstr); |
|  | ahoCorasik.countpos() |
|  | makeTable() |
|  | for (var i = 0; i < ressubstr.length; i++) { |
|  | ressubstr[i] = " " + ressubstr[i] |
|  | } |
|  | document.getElementById("ressubstrtd").style.display = "none" |
|  | document.getElementById("resstrtd").style.display = "" |
|  | document.getElementById("substrings").innerHTML = makeResSubStr(ressubstr) |
|  | } |
|  |  |
|  | function changeS(){ |
|  | document.getElementById("inputs").style.display = "" |
|  | document.getElementById("controls\_and\_tree").style.display = "none" |
|  | document.getElementById("visualizing").style.display = "none" |
|  | } |
|  |  |
|  | function startVis(){ |
|  | // ressubstr = [] |
|  | nowindex = 0 |
|  | resstr = " " + document.getElementById("resstr").value |
|  | document.getElementById("string").innerHTML = `<div>${resstr}</div>` |
|  | console.log(ahoCorasik.find(resstr)) |
|  | state = 0 |
|  | showState() |
|  | document.getElementById("inputs").style.display = "none"  25  RU.17701729. 04.13-01 01-1 |
|  | document.getElementById("controls\_and\_tree").style.display = "" |
|  | document.getElementById("visualizing").style.display = "" |
|  | } |
|  |  |
|  | function nextState(){ |
|  | state += 1 |
|  | if(state > ahoCorasik.statusarr.length) |
|  | state = ahoCorasik.statusarr.length |
|  | else showState() |
|  | } |
|  |  |
|  | function previousState(){ |
|  | state -= 1 |
|  | if(state < 0) |
|  | state = 0 |
|  | else showState() |
|  | } |
|  |  |
|  | const makeRes = ()=>{ |
|  | res = `<p>Вычисление завершено, результат:<br/>` |
|  | for(let i = 0; i < ahoCorasik.result.length; ++i){ |
|  | if(ahoCorasik.result[i]["second"].length == 0) continue |
|  | res += `&nbsp&nbspПодстрока "${ahoCorasik.result[i]["second"]}" входит ${ahoCorasik.result[i]["first"].length} раз` |
|  | if(ahoCorasik.result[i]["first"].length > 0) |
|  | res += ` начиная с позиции:<br/>` |
|  | else res += `;<br/>` |
|  | for (let j = 0; j < ahoCorasik.result[i]["first"].length; j++) { |
|  | res += `&nbsp&nbsp&nbsp&nbsp${ahoCorasik.result[i]["first"][j]};<br/>` |
|  | } |
|  | } |
|  | res += `</p>` |
|  | return res |
|  | } |
|  |  |
|  | function selectAlgo(state, color="#ff0"){ |
|  | if(state<-1 || state >= ahoCorasik.statusarr.length) return -1 |
|  | console.log(ahoCorasik.statusarr[state],color) |
|  | if(state == -1){ |
|  | document.getElementById("algoFind").getElementsByTagName("div")[1].style.backgroundColor = color |
|  | return 0  26  RU.17701729. 04.13-01 01-1 |
|  | } |
|  | if(ahoCorasik.statusarr[state]["try\_to\_go\_next"] && !ahoCorasik.statusarr[state]["notmovestr"]){ |
|  | document.getElementById("algoFunc").getElementsByTagName("div")[0].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["result"] && !ahoCorasik.statusarr[state]["notmovestr"]){ |
|  | document.getElementById("algoFind").getElementsByTagName("div")[8].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["vertex"]){ |
|  | document.getElementById("algoFind").getElementsByTagName("div")[4].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["check\_vertex"]){ |
|  | document.getElementById("algoFind").getElementsByTagName("div")[7].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["get\_link"]){ |
|  | document.getElementById("algoFunc").getElementsByTagName("div")[6].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["update\_link\_from\_parent"]){ |
|  | document.getElementById("algoFunc").getElementsByTagName("div")[11].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["return\_link"]){ |
|  | document.getElementById("algoFunc").getElementsByTagName("div")[12].style.backgroundColor = color |
|  | } |
|  | if(ahoCorasik.statusarr[state]["go\_by\_link"]){ |
|  | 27  RU.17701729. 04.13-01 01-1  document.getElementById("algoFunc").getElementsByTagName("div")[5].style.backgroundColor = color |
|  | } |
|  | return 0 |
|  | } |
|  |  |
|  | function showState(){ |
|  | setProgress(100.\*state/ahoCorasik.statusarr.length) |
|  | console.log(state, ahoCorasik.statusarr[state]) |
|  | selectAlgo(state-2,"") |
|  | selectAlgo(state+1,"") |
|  | selectAlgo(state-1,"rgb(156, 128, 234)") |
|  | selectAlgo(state,"#ff0") |
|  | if(state === ahoCorasik.statusarr.length) |
|  | document.getElementById("operation").innerHTML = makeRes() |
|  | else { |
|  | if(ahoCorasik.statusarr[state]["id"] && !ahoCorasik.statusarr[state]["notmovestr"]){ |
|  | console.log("id") |
|  | selectSymbolStr(ahoCorasik.statusarr[state]["id"],"#ff0") |
|  | nowindex = ahoCorasik.statusarr[state]["id"] |
|  | } |
|  | if(ahoCorasik.statusarr[state]["try\_to\_go\_next"] && !ahoCorasik.statusarr[state]["notmovestr"]){ |
|  | console.log("try\_to\_go\_next") |
|  | document.getElementById("operation").innerHTML = `v = go(v,c) <br/> |
|  | Пытаемся перейти из текущей найденой подстроки в наидлиннейший префикс искомых подстрок, содержащий максимальный суффикс текущей подстроки с добавлением к нему символа "${ahoCorasik.statusarr[state]["symb"]}" в конец.` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | // console.log(ahoCorasik.statusarr[state]["try\_to\_go\_next"],ahoCorasik.statusarr[state]["symb"]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["try\_to\_go\_next"],"rgba(230, 19, 19, 0.64)") |
|  | selectSymbolStr(nowindex,"#f00",2,"#ff0") |
|  | } |
|  | if(ahoCorasik.statusarr[state]["result"] &&  28  RU.17701729. 04.13-01 01-1  !ahoCorasik.statusarr[state]["notmovestr"]){ |
|  | console.log("result") |
|  | document.getElementById("operation").innerHTML = `addRes(pv) <br/> |
|  | Символ pv является концом подстроки ${ahoCorasik.statusarr[state]["result"]}, начиная с позиции ${ahoCorasik.statusarr[state]["pos"]}.` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolStr(ahoCorasik.statusarr[state]["pos"],"#00ff28",ahoCorasik.statusarr[state]["result"].length) |
|  | } |
|  | if(ahoCorasik.statusarr[state]["vertex"]){ |
|  | console.log("vertex") |
|  | document.getElementById("operation").innerHTML = `v = go(v, nextSymb) <br/> |
|  | Перешли на текущий символ, далее будет произведена проверка на наличие подстрок, оканчивающимся в данном символе строки. ` |
|  | // markedSubStr = [] |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["vertex"].stringid,ahoCorasik.statusarr[state]["vertex"].stringelid]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["vertex"],"#ff0") |
|  | } |
|  | if(ahoCorasik.statusarr[state]["check\_vertex"]){ |
|  | console.log("check\_vertex") |
|  | document.getElementById("operation").innerHTML = `if(checkIsList(pv)): <br/>&nbsp&nbsp addRes(pv) <br/>&nbsp&nbsp pv = getLink(pv) <br/> |
|  | Проверяем что символ pv не является концом одной из подстрок, после чего переходим по ссылке данного символа для того, чтобы сравнить суффиксы данной подстроки с её же префиксами из искомых подстрок. ` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["check\_vertex"],"rgba(230, 19, 19, 0.64)") |
|  | } |
|  | if(ahoCorasik.statusarr[state]["get\_link"]){  29  RU.17701729. 04.13-01 01-1 |
|  | console.log("get\_link") |
|  | document.getElementById("operation").innerHTML = `v = getLink(v) <br/> |
|  | Пытаемся получить ссылку на наидлиннейший префикс из всех искомых подстрок, являющийся наидлиннейшим суффиксом данной строки.` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["get\_link"],"rgba(230, 19, 19, 0.64)") |
|  | } |
|  | if(ahoCorasik.statusarr[state]["update\_link\_from\_parent"]){ |
|  | console.log("update\_link\_from\_parent") |
|  | document.getElementById("operation").innerHTML = `v.link = go(getLink(t[v].parent), t[v].symb) <br/> |
|  | Пытаемся построить ссылку на наидлиннейший префикс из всех искомых подстрок, являющийся наидлиннейшим суффиксом данной строки, для текущего символа как наидлиннейший суффикс подстроки (get\_link), оканчивающейся в его предке (t[v].p), из которого делаем переход (go) на символ, хранимый в текущей вершине (t[v].pch).` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolSubStrP(ahoCorasik.statusarr[state]["update\_link\_from\_parent"], |
|  | ahoCorasik.t[ahoCorasik.statusarr[state]["update\_link\_from\_parent"].p], "#ff0","rgba(230, 19, 19, 0.64)") |
|  | } |
|  | if(ahoCorasik.statusarr[state]["return\_link"]){ |
|  | console.log("return\_link") |
|  | document.getElementById("operation").innerHTML = `return v.link <br/> |
|  | Возвращаем ссылку на наидлиннейший префикс из всех искомых подстрок, являющийся наидлиннейшим суффиксом данной строки.` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["return\_link"],"rgba(230, 19, 19, 0.64)")  30  RU.17701729. 04.13-01 01-1 |
|  | } |
|  | if(ahoCorasik.statusarr[state]["go\_by\_link"]){ |
|  | console.log("go\_by\_link") |
|  | document.getElementById("operation").innerHTML = `return v == 0 ? 0 : go(getLink(v), c) <br/> |
|  | Если переход ещё не построен, и мы находимся в нулевой вершине, то тогда не существует искомой подстроки, начинающейся с данного символа и мы должны остаться в нулевой вершине, <br/> |
|  | Иначе переходим по ссылке на наидлиннейший суффикс данной подстроки и пытаемся перейти на следующий символ уже из неё.` |
|  | // markedSubStr.push([ahoCorasik.statusarr[state]["check\_vertex"].stringid,ahoCorasik.statusarr[state]["check\_vertex"].stringelid]) |
|  | selectSymbolSubStr(ahoCorasik.statusarr[state]["go\_by\_link"],"rgba(230, 19, 19, 0.64)") |
|  | } |
|  | if(state == 0){ |
|  | selectSymbolStr(0,"#ff0") |
|  | } |
|  | } |
|  | } |

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**ЛИСТ РЕГИСТРАЦИИ ИЗМЕНЕНИЙ**

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| Изм. | Номера листов (страниц) | | | | Всего листов | № документа | Входящий № | Подпись | Дата |
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