

O'ZBEKISTON RESPUBLIKASI ALOQA,
AXBOROTLASHTIRISH VA TELEKOMUNIKATSIYA
TEKNOLOGIYALARI DAVLAT QO'MITASI
TOSHKENT AXBOROT TEKNOLOGIYALARI
UNIVERSITETI

Ma'lumotlar tuzilmasi fani bo'yicha

Mustaqil ishi

Mavzu: Tezkor saralash algoritmini vizuallashtirish

Guruh: 213-13 KIF

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Reja:

1. Testlar saralash algoritmi.
2. Embarcadero RAD Studio XE2 da interfeysni hosil qilish
3. Dastur kodi
4. Foydalanilgan adabiyotlar

Tezkor saralashda o'q element tanlanadi va o'q elementdan kichik elementlar bir tomonda, kattalari esa ikkinchi tomonda saralanadi. Quyida ushbu algoritmining qanday ishlashi ko'rsatilgan.

```

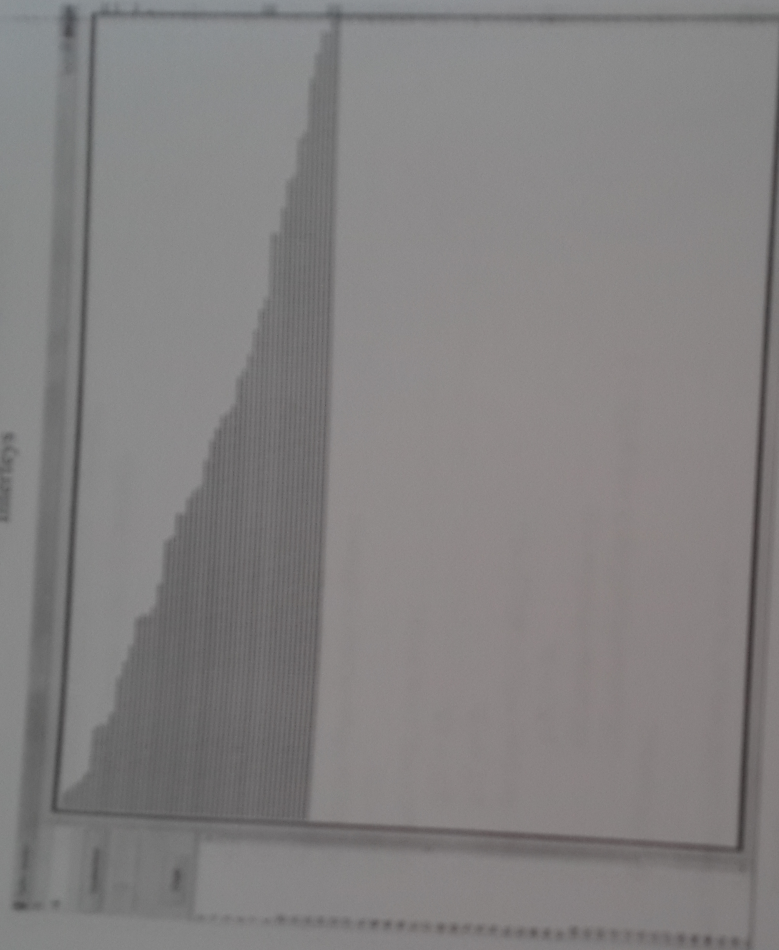
graph TD
    Root["l=0, r=7  
s=4"]
    N1["l=0, r=3  
s=1"]
    N2["l=2, r=3  
s=2"]
    N3["l=5, r=5  
s=6"]
    N4["l=0, r=0"]
    N5["l=2, r=1"]
    N6["l=2, r=1  
s=2"]
    N7["l=3, r=3"]
    N8["l=5, r=5"]
    N9["l=7, r=7"]

    Root --- N1
    Root --- N2
    Root --- N3
    N1 --- N4
    N1 --- N5
    N2 --- N6
    N2 --- N7
    N3 --- N8
    N3 --- N9
  
```

9 9 9 7 7
6 6 6 8 8
4 4 4 7 7

Yenikar algoritmini vizuallashtirishda Formaga quyidagi komponentlarni kerakli tartib bilan joylashtirdik: Panel, ListBox, Button, Label, Label2, TrackBar.

Interfeys



Dastur kod

```
include <vccl.h>
#pragma once
#include "Unit1.h"

//
#pragma pack(push, 1)
#pragma resource "resources"
TFrm1 *Form1;
int n = 0;
int *a, int count = 0;
```

```

// -----
__fastcall TForm1::TForm1(TComponent* Owner) : TForm(Owner) {
}

void TForm1::graph() {
    HDC GHandle = GetDC(Panel2->Handle);
    TCanvas *GCanvas = new TCanvas();
    TPoint p;

    GCanvas->Handle = GHandle;
    GCanvas->Pen->Width = 5;
    GCanvas->Pen->Color = clRed;
    GCanvas->Rectangle(15, 15, Panel2->Width - 15, Panel2->Height - 15);
    GCanvas->Pen->Width = 2;
    GCanvas->Pen->Color = clNavy;
    p.X = 15;
    for (int i = 0; i < n; i++) {
        p.X = 15;
        p.Y += 5;
        for (int j = 0; j < a[i]; j++) {
            p.X += 6;
            GCanvas->PenPos = p;
            GCanvas->LineTo(p.X + 4, p.Y); }
        free(GCanvas);
    }

    void TForm1::quickSort(int* a, int n) {
        long i = 0, j = n;
        int temp, p;
        p = a[n >> 1];
        do {
            while (a[i] < p)
                i++;
            while (a[j] > p)
                j--;
            if (i <= j) {
                temp = a[i];
                a[i] = a[j];
                a[j] = temp;
                graph();
                Sleep(100);
            }
        } while (i < j);
    }
}

```

```

if (n > i)
    quickSort(a + i, n - i); }

//-----
void __fastcall TForm1::LabeledEdit1Change(TObject *Sender) {
    n = StrToIntDef(LabeledEdit1->Text, 0);
    srand(time(NULL));
    ListBox1->Clear();
    a = new int[n];
    for (int i = 0; i < n; i++) {
        ListBox1->Items->Add(IntToStr(rand() % (Panel2->Width / 6)));
        a[i] = StrToIntDef(ListBox1->Items->Strings[i], 0);
    }
    graph();
    ListBox1->Clear();
    for (int i = 0; i < n; i++)
        ListBox1->Items->Add(IntToStr(a[i]));
}

//-----
void __fastcall TForm1::Button1Click(TObject *Sender) {
    quickSort(a, n);
    ListBox1->Clear();
    for (int i = 0; i < n; i++)
        ListBox1->Items->Add(IntToStr(a[i]));
}

//-----
void __fastcall TForm1::TrackBar1Change(TObject *Sender) {
    tout = TrackBar1->Position;
}

//-----
void __fastcall TForm1::Button2Click(TObject *Sender)
{
    Close(); }
//-----

```