O`zbekiston Aloqa va Axborotlashtirish Agentligi
Toshkent Axborot Texnologiyalari Universiteti
ATDT Kafedrasi

Kurs ishi

Mavzu:
Aqliy o`yin dasturini tuzish.

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Toshkent 2007

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Hozirda Axborot texnologiyalari jadal suratlar bilan rivojlanib bormoqda va hayotning barcha sohalariga tadbiq etilmoqda. Axborot texnologiyalaridan foydalanish foydalanuvchiga ko`pgina qulayliklar yaratib maqsaga tez va sifatli erishishga yordam beradi. Shu jumladan hozirda o`quv jarayoniga Axborot texnologiyalarini keng jalb etish yaxshi natijalarga olib kelishi isbotlangan faktdir. Shu o`rinda ko`pgina interfaol dasurlar, elektron o`quv qo`llanmalar, o`quvchi aqlini "charxlovchi" turli aqliy o`yinlardan foydalanish samaraliydir. Men ushbu kurs ishi mavzusi ya`ni "Aqliy o`yin yaratish" jarayonida "15" o`yinini tuzib chiqdim. To`g`ri, bu o`yin ko`p martalab har-hil variantlarda tuzilgan, lekin o`zbekcha interfeysda deyarli yaratilmagan va o`ziga hos qulayliklarga ega. Bu o`yin Delphi dasturlash tilida komplyatsiya qilindi va Windows muhitida ishlay oladi. Quyida bu o`yin haqida, dastur algoritmi, dastur kodi va protseduralarga izohlar berilgan.

2.1. "15" o`yini haqida

Bu o`yin 16 ta kvadrat katakka bo`lingan o`yin maydoni ichidagi 15 ta raqamlangan (donalar 1 dan 15 gacha bo`lgan sonlar bilan tasodifiy ravishda raqamlangan) donalarni to`gri ketma-ketlikda tartiblashdan iborat.

O`yin maydonchasida ixtiyoriy dona faqat qo`shni bo`sh (ya`ni raqamlanmagan) katakka yura oladi. (1-rasmda faqat 4, 5, 9-kataklar yura oladi, agar 4-yursa 6, 2 yoki 4 bo`sh katakka yura oladi va hakozo.) 1-15 gacha bo`lgan donalar tartiblanib borilgan sari o`yin qiyinlashib boradi. Donalar qancha tartiblangani sari yuriladigan yo`llar soni kamayadi. Lekin maqsad bitta donalarni tartib raqami bo`yicha tartiblash.

2.2. Dastur algoritmi

Algoritm quyidagicha tashkil qilinadi: 1-16 gacha bo`lgan raqamlar 1 o`lchovli massivga ketma-ket joylashtiriladi va ular tasodifiy ravishda o`rin almashtiriladi. Hosil bo`lgan tasodifiy ketma-ketlik 4X4 kataklardagi donalarga joylashtiriladi. 16-raqamli katak bo`sh xisoblanadi. Donalarni tartiblash jarayonida qaysi bir dona bo`sh katak bilan almashsa 1 o`lchovli massivda ham ular o`rni almashadi. Shu tariqa agar 4X4 katakdagi donalar tartiblansa 1 o`lchovli massiv elementlari ham o`sish tartibida saralangan bo`ladi. Har bir yurishda 1 o`lchovli massivni tartiblanganligini tekshirish kifoya. Bu dastur interfeysini Delphi dasturlash muhitida oson yaratish va algoritmni ishlab chiqish mumkin. Quyida dastur kodi to`liq berilgan.

2.3 Dastur kodi

1. Delphi proekt fayli (*.dpr)

```pascal
program Game;
uses
  Forms,
  Square15 in 'Square15.pas' {Form1};

{$R *.res}

begin
  Application.Initialize;
  Application.Title := '15 O`yin New!!!';
  Application.CreateForm(TForm1, Form1);
  Application.Run;
end.
```

2. Delphi asosiy dastur kodi (*.pas)

```pascal
unit Square15;
interface
uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, StdCtrls, Menus, ExtCtrls, Grids, ValEdit, ComCtrls;

type
  TForm1 = class(TForm)
    Button1: TButton;
    Button2: TButton;
    Button3: TButton;
    Button4: TButton;
    Button5: TButton;
    Button6: TButton;
    Button7: TButton;
    Button8: TButton;
    Button9: TButton;
    Button10: TButton;
    Button11: TButton;
    Button12: TButton;
    Button13: TButton;
    Button14: TButton;
    Button15: TButton;
    Button16: TButton;
    menu: TMainMenu;
```

```
    Oyin1: TMenuItem;
    Korinish1: TMenuItem;
    Malumot1: TMenuItem;
    Yangi1: TMenuItem;
    Saqlash1: TMenuItem;
    yuklash: TMenuItem;
    tamom: TMenuItem;
    Shrift1: TMenuItem;
    Rekordlar1: TMenuItem;
    Yordam1: TMenuItem;
    Oyinhaqida1: TMenuItem;
    Label1: TLabel;
    ListBox: TListBox;
    Timer1: TTimer;
    Label3: TLabel;
    time: TMenuItem;
    FontDialog: TFontDialog;
    SaveDialog: TSaveDialog;
    OpenDialog: TOpenDialog;
    Label2: TLabel;
    procedure FormCreate(Sender: TObject);
    procedure setnumber(sender:Tobject);
    procedure go(sender:Tobject);
    procedure Button1Click(Sender: TObject);
    procedure Button2Click(Sender: TObject);
    procedure Button3Click(Sender: TObject);
    procedure Button4Click(Sender: TObject);
    procedure Button5Click(Sender: TObject);
    procedure Button6Click(Sender: TObject);
    procedure Button7Click(Sender: TObject);
    procedure Button8Click(Sender: TObject);
    procedure Button9Click(Sender: TObject);
    procedure Button10Click(Sender: TObject);
    procedure Button11Click(Sender: TObject);
    procedure Button12Click(Sender: TObject);
    procedure Button13Click(Sender: TObject);
    procedure Button14Click(Sender: TObject);
    procedure Button15Click(Sender: TObject);
    procedure Button16Click(Sender: TObject);
    procedure Timer1Timer(Sender: TObject);
    procedure newgame(Sender: TObject);
    procedure Yangi1Click(Sender: TObject);
    procedure check(Sender: TObject);
    procedure Shrift1Click(Sender: TObject);
    procedure Rekordlar1Click(Sender: TObject);
```

```
    procedure Yordam1Click(Sender: TObject);
    procedure Oyinhaqida1Click(Sender: TObject);
    procedure Saqlash1Click(Sender: TObject);
    procedure tamomClick(Sender: TObject);
    procedure setrecord(sender:Tobject);
    procedure yuklashClick(Sender: TObject);

  private
    { Private declarations }
  public
    { Public declarations }
  end;

var
  Form1: TForm1;
  a:array[1..16]of byte;
  i,t,z,k,r,m,s,y:byte;
  yes:boolean;
  f:textfile;
  ball:integer;
  rec:array[1..15]of integer;
  nm:array[1..15]of string[20];
implementation

{$R *.dfm}

procedure swap();
begin
yes:=true;
t:=a[z];
a[z]:=a[k];
a[k]:=t;
end;

procedure tform1.check(Sender: TObject);
var
done:boolean;
ss:string;
begin
done:=true;
for i:=1 to 16 do
if a[i]<>i then done:=false;
if done then
begin
  timer1.Enabled:=false;
```

```
  Application.MessageBox(
     'Siz g`olibsiz!',
     ':)',
     MB_OK);
  ss:=inputbox('Ismingizni kiriting', '','' );
  nm[13]:=ss;
  rec[13]:=ball;
  setrecord(sender);
  newgame(sender);
end;
end;

procedure tform1.setnumber(sender:Tobject);
var
s:string;
begin
  for i:=1 to 16 do
  begin
   if a[i]=16 then s:='' else s:=inttostr(a[i]);
    case i of
     1:button1.Caption:=s;
     2:button2.Caption:=s;
     3:button3.Caption:=s;
     4:button4.Caption:=s;
     5:button5.Caption:=s;
     6:button6.Caption:=s;
     7:button7.Caption:=s;
     8:button8.Caption:=s;
     9:button9.Caption:=s;
     10:button10.Caption:=s;
     11:button11.Caption:=s;
     12:button12.Caption:=s;
     13:button13.Caption:=s;
     14:button14.Caption:=s;
     15:button15.Caption:=s;
     16:button16.Caption:=s;
    end;
  end;
label1.Caption:=inttostr(y)+' ta yurdingiz!';
y:=y+1;
ball:=ball-1;
check(sender);
end;

procedure tform1.go(sender:Tobject);
```

```
begin
 for i:=1 to 16 do if a[i]=16 then k:=i;
 yes:=false;
 case z of
  1: if (k=2) or (k=5) then swap();
  2: if (k=1) or (k=6) or (k=3) then swap();
  3: if (k=2) or (k=7) or (k=4) then swap();
  4: if (k=3) or (k=8) then swap();
  5: if (k=1) or (k=6) or (k=9) then swap();
  6: if (k=2) or (k=5) or (k=7) or (k=10) then swap();
  7: if (k=3) or (k=6) or (k=8) or (k=11) then swap();
  8: if (k=4) or (k=7) or (k=12) then swap();
  9: if (k=5) or (k=10) or (k=13) then swap();
  10: if (k=6) or (k=9) or (k=11) or (k=14) then swap();
  11: if (k=7) or (k=10) or (k=12) or (k=15) then swap();
  12: if (k=8) or (k=11) or (k=16) then swap();
  13: if (k=9) or (k=14) then swap();
  14: if (k=10) or (k=13) or (k=15) then swap();
  15: if (k=11) or (k=14) or (k=16) then swap();
  16: if (k=12) or (k=15) then swap();
 end;
 if yes then setnumber(sender);
end;

procedure tform1.setrecord(sender:Tobject);
var
ss:string;
j,t:integer;
begin
for i:=1 to 12 do
for j:=i+1 to 13 do
if rec[i]<=rec[j] then
begin
 t:=rec[i];
 rec[i]:=rec[j];
 rec[j]:=t;
 ss:=nm[i];
 nm[i]:=nm[j];
 nm[j]:=ss;
end;

listbox.Items.Clear;
for i:=1 to 12 do listbox.Items.Add(inttostr(rec[i])+' '+nm[i]);
listbox.Items.SavetoFile('c:\windows\system32\const.15r');
end;
```

```pascal
procedure tform1.newgame(sender:Tobject);
begin
 y:=0;
 m:=0;
 s:=0;
 ball:=1000;
 timer1.Enabled:=true;
 randomize();
 for i:=1 to 16 do a[i]:=i;
 for i:=1 to 16 do
 begin
  r:=random(15)+1;
  t:=a[i]; a[i]:=a[r]; a[r]:=t;
 end;
 setnumber(sender);
end;

procedure TForm1.FormCreate(Sender: TObject);

begin
 assignfile(f,'c:\windows\system32\const.15r');
 try
  reset(f);
 except
  on einouterror do
  begin
   rewrite(f);
   newgame(sender);
  end;
 end;
 i:=0;
 while not(eof(f)) do
 begin
  inc(i);
  read(f,rec[i]);
  read(f,nm[i]);
 end;
 closefile(f);
 newgame(sender);
 setrecord(sender);
end;

procedure TForm1.Button1Click(Sender: TObject);
begin
```

```pascal
z:=1; go(sender);
end;

procedure TForm1.Button2Click(Sender: TObject);
begin
z:=2; go(sender);
end;

procedure TForm1.Button3Click(Sender: TObject);
begin
z:=3; go(sender);
end;

procedure TForm1.Button4Click(Sender: TObject);
begin
z:=4; go(sender);
end;

procedure TForm1.Button5Click(Sender: TObject);
begin
z:=5; go(sender);
end;

procedure TForm1.Button6Click(Sender: TObject);
begin
z:=6; go(sender);
end;

procedure TForm1.Button7Click(Sender: TObject);
begin
z:=7; go(sender);
end;

procedure TForm1.Button8Click(Sender: TObject);
begin
z:=8; go(sender);
end;

procedure TForm1.Button9Click(Sender: TObject);
begin
z:=9; go(sender);
end;

procedure TForm1.Button10Click(Sender: TObject);
begin
```

```pascal
z:=10; go(sender);
end;

procedure TForm1.Button11Click(Sender: TObject);
begin
z:=11; go(sender);
end;

procedure TForm1.Button12Click(Sender: TObject);
begin
z:=12; go(sender);
end;

procedure TForm1.Button13Click(Sender: TObject);
begin
z:=13; go(sender);
end;

procedure TForm1.Button14Click(Sender: TObject);
begin
z:=14; go(sender);
end;

procedure TForm1.Button15Click(Sender: TObject);
begin
z:=15; go(sender);
end;

procedure TForm1.Button16Click(Sender: TObject);
begin
z:=16; go(sender);
end;

procedure TForm1.Timer1Timer(Sender: TObject);
begin
s:=s+1;
if s=60 then begin m:=m+1; ball:=ball-60; s:=0; end;
label2.Caption:=inttostr(ball);
menu.Items.Items[3].Caption:=inttostr(m)+' : ' +inttostr(s);
end;

procedure TForm1.Yangi1Click(Sender: TObject);
begin
 newgame(sender);
end;
```

```
procedure TForm1.Shrift1Click(Sender: TObject);
var
font:Tfont;
begin
if fontdialog.Execute then
begin
 font:=fontdialog.Font;
 button1.Font:=font;  button2.Font:=font;
 button3.Font:=font;  button4.Font:=font;
 button5.Font:=font;  button6.Font:=font;
 button7.Font:=font;  button8.Font:=font;
 button9.Font:=font;  button10.Font:=font;
 button11.Font:=font;  button12.Font:=font;
 button13.Font:=font;  button14.Font:=font;
 button15.Font:=font;  button16.Font:=font;
end;
end;


procedure TForm1.Rekordlar1Click(Sender: TObject);
begin
if form1.Height<400 then
  begin form1.Height:=form1.Constraints.MaxHeight;
  menu.Items.Items[1].Items[1].Checked:=true;
  end
 else
   begin form1.Height:=form1.Constraints.MinHeight;
   menu.Items.Items[1].Items[1].Checked:=false;
  end;
end;


procedure TForm1.Yordam1Click(Sender: TObject);
begin
 Showmessage('Yurmoqchi bo`lgan katakni bir marta bosing, agar bo`sh kata
k bilan qo`shni bo`lsa ular joy almashadi!');
end;


procedure TForm1.Oyinhaqida1Click(Sender: TObject);
begin
 Showmessage('Produced by Homidjonov Shavkat Copyright 2006. TATU 21
0-06 ITu');
end;
```

```
procedure TForm1.Saqlash1Click(Sender: TObject);
var
f:textfile;
ss,st:string;
begin
 if savedialog.Execute then
 begin
  ss:=savedialog.filename;
  st:=copy(ss,length(ss)-2,3);
  if st<>'.15' then ss:=ss+'.15';
  assignfile(f,ss);
  rewrite(f);
  for i:=1 to 16 do
  write(f,inttostr(a[i])+' ');
  writeln(f);
  writeln(f,inttostr(y)+' '+inttostr(m)+' '+inttostr(s));
  closefile(f);
 end;
end;

procedure TForm1.yuklashClick(Sender: TObject);
var f:textfile;
begin
if   opendialog.Execute then
begin
 assignfile(f,opendialog.FileName);
 reset(f);
 for i:=1 to 16 do read(f,a[i]);
 read(f,y);
 read(f,m);
 read(f,s);
 ball:=1000-y-(m+1)*s;
 setnumber(sender);
 closefile(f);
end;
end;

 procedure TForm1.tamomClick(Sender: TObject);
begin
if Application.MessageBox(
    'O`yindan chiqmoqchimisiz?',    ':(',
    MB_OKCANCEL) = IDOK then close();
end;
end.
```

2.4. Dasturdagi protseduralar mazmuni

procedure FormCreate(Sender: TObject);
Interfeysni (asosiy formani tashkil qilish);
procedure setnumber(sender:Tobject);
Katakdagi donalarni raqamlab chiqish
procedure go(sender:Tobject);
Bo`sh katakni qo`shni kataklar bilan almashtirish
procedure Button1Click(Sender: TObject);
1-donani yurish
procedure Button2Click(Sender: TObject);
2-donani yurish
procedure Button3Click(Sender: TObject);
3-donani yurish
procedure Button4Click(Sender: TObject);
4-donani yurish
procedure Button5Click(Sender: TObject);
5-donani yurish
procedure Button6Click(Sender: TObject);
6-donani yurish
procedure Button7Click(Sender: TObject);
7-donani yurish
procedure Button8Click(Sender: TObject);
8-donani yurish
procedure Button9Click(Sender: TObject);
9-donani yurish
procedure Button10Click(Sender: TObject);
10-donani yurish
procedure Button11Click(Sender: TObject);
11-donani yurish
procedure Button12Click(Sender: TObject);
12-donani yurish
procedure Button13Click(Sender: TObject);
13-donani yurish
procedure Button14Click(Sender: TObject);
14-donani yurish
procedure Button15Click(Sender: TObject);
15-donani yurish
procedure Button16Click(Sender: TObject);
Bo`sh-donani yurish
procedure Timer1Timer(Sender: TObject);
Vaqtni hisoblab borish
procedure newgame(Sender: TObject);

Yangi o`yin hosil qilish
   procedure Yangi1Click(Sender: TObject);
Yangi o`yin hosil qilish
   procedure check(Sender: TObject);
1 o`lchovli massiv elementlari tartiblanganligini tekshirish
   procedure Shrift1Click(Sender: TObject);
Donadagi raqamlar shriftini o`zgartirish
   procedure Rekordlar1Click(Sender: TObject);
Rekordlar oynasini chiqarish
   procedure Yordam1Click(Sender: TObject);
Yordamoynasini chiqarish
   procedure Oyinhaqida1Click(Sender: TObject);
Dastur haqida ma`lumot berish
   procedure Saqlash1Click(Sender: TObject);
O`yin jarayonini faylga saqlash
   procedure tamomClick(Sender: TObject);
Dasturdan chiqish
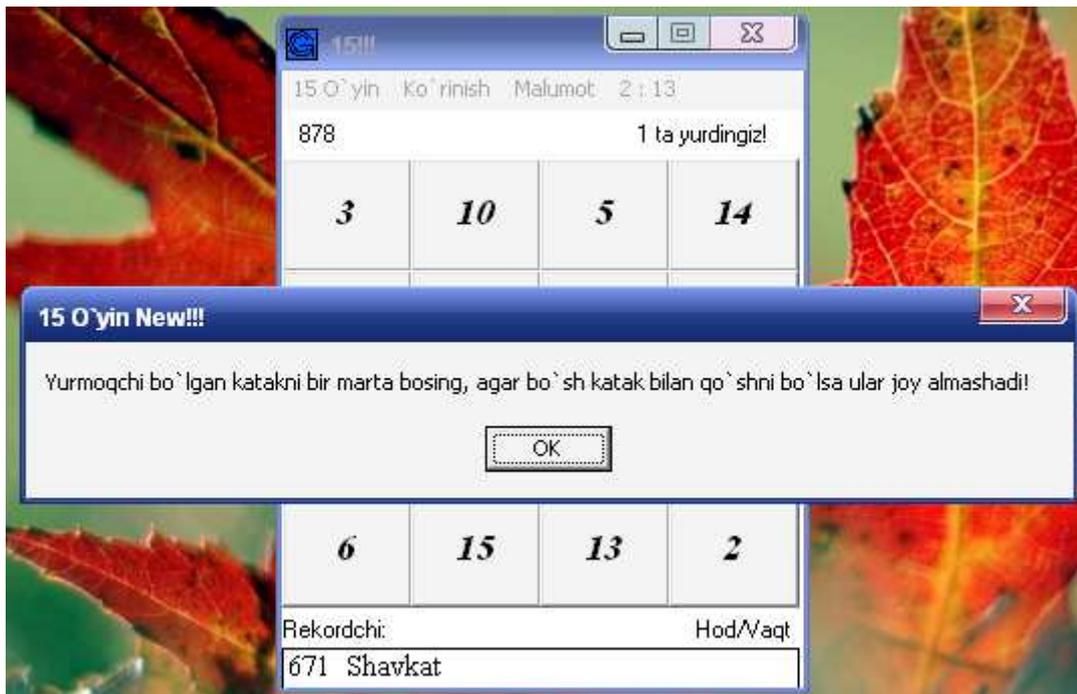   **procedure** setrecord(sender:Tobject);
Eng yuqori natijali foydalanuvchini rekordga kiritish
   procedure yuklashClick(Sender: TObject);
Faylga saqlangan o`yinni yuklash va davom ettirish

2.5. Natijalar

Mavzuga xulosa

Men kurs ishini bajarish davomida shunga amin bo`ldimki, zaminaviy axborot texnoligiyalari yildan yiga rivojlanib bormoqda. Ularni o`rganish va ishlab chiqarishga tadbiq etish uchun tinmay o`qib izlanish kerak. Dasturlash davr talabi. Har qanday zamonaviy axborot texnologiyalarinig asosi dasturlashdan iborat. Shunday ekan avvalambor zamonaviy dasturlash tillari (Visual Studio, Delphi, JAVA, PHP) ni o`rganish va talabalik davridanoq ushbu dasturlash tillarida turli hil dasturlar (o`yin dasturlar, o`quv dasturlar, amaliy dasturlar…) yaratish bilim va malakamizni yanada oshishga hizmat qiladi. Men yuqorida berilgan topshiriqni bajarish va uni nazariy jihatdan o`ganish jarayonida Borland Delphi 7.0 dasturlash muhitida ishlash ko`nikmamni yanada oshirdim. Shu sohada taxsil olar ekanman, bundan keyin ham o`z bilimlarimni mustahkamlash va oshirish men uchun foydadan holi bo`lmaydi.   .

Foydalanilgan adabiyotlar:

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