basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIORSERTIFIKAAT-EKSAMEN/
NASIONALE SENIORSERTIFIKAAT-EKSAMEN

INLIGTINGSTEGNOLOGIE V1

MEI/JUNIE 2024

NASIENRIGLYNE

PUNTE: 150

Hierdie nasienriglyne bestaan uit 29 bladsye.

Goedgekeur:

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Interne Moderator (MJ Zeeman)
Datum: 2024-05-14

ALGEMENE INLIGTING:

- Hierdie nasienriglyne moet as die basis vir die nasiensessie gebruik word. Dit is voorberei om deur nasieners gebruik te word. Daar word na alle nasieners verwag om 'n deeglike standaardiseringsvergadering by te woon om seker te maak dat die riglyne konsekwent geïnterpreteer en tydens die nasien van die leerders se werk toegepas word.

- Let op dat leerders wat 'n alternatiewe korrekte oplossing as wat as voorbeeld van 'n oplossing in die nasienriglyne gegee word verskaf, volle krediet vir die relevante oplossing moet kry tensy die spesifieke instruksies in die vraestel nie gevolg is nie of die vereistes van die vraag nie nagekom is nie.

- **Bylae A, B, C** en **D** (bladsy 3 tot 11) sluit die nasienriglyne vir elke vraag in.

- **Bylae E, F, G** en **H** (bladsy 12 tot 29) bevat voorbeelde van oplossings vir Vrae 1 tot 4 in programmeringskode.

- Kopieë van **Bylae A, B, C, D** en **die opsomming van die leerder se punte** (bladsy 3 tot 11) moet vir elke leerder gemaak word en tydens die nasiensessie voltooi word.

BYLAE A

VRAAG 1: NASIENRUBRIEK – ALGEMENE PROGRAMMERINGSVAARDIGHEDE

SENTRUMNOMMER:	EKSAMENNOMMER:		
VRAAG	**BESKRYWING**	**MAKS. PUNTE**	**LEERDER-PUNT**
1.1	**Knoppie [1.1 - Gender]** Stel die opskrif ('caption') op "Gender" ✓ Voeg die "Male"-opsie by ✓ Stel die 'Columns'-eienskap op 2 ✓	**3**	

1.2	**Knoppie [1.2 - Random day]**
	
	Verklaar 'n heelgetal veranderlike vir die ewekansige getal ✓
	Genereer ewekansige getal in korrekte reeks (1 – 7) ✓
	Vertoon "Day:" ✓ en die ewekansige getal omgeskakel na string ✓ in die opskrif lblQ1_2 ✓
	Stel die lysblokkie ('list box') item indeks ✓ op die ewekansige getal ✓
	Toets (if) ✓(ewekansige getal = 1) ✓of (ewekansige getal = 7) ✓
	  Vertoon 'Weekend' in edtQ1_2 ✓
	Anders ✓
	  Vertoon 'Weekday' ✓
	
	Alternatief:
	case lstQ1_2.ItemIndex of (2)
	  1,7 : edtQ1_2.Text := 'Weekend'; (2)
	  2..6 : edtQ1_2.Text := 'Weekday'; (2)
	end;
		13	

1.3	**Knoppie [1.3 - Calculate]** Verklaar 'n geskikte veranderlike/s ✓ Verkry jare uit die spin edit ✓ *Bereken bonus:* `rBonus := Power (P,iJare)` ✓ `  * SQRT` ✓ `(SQR(P)` ✓ `/ 7 * 20`✓`)` Toets of manager-kontroleblokkie ('checkbox') afgemerk is ✓ `  rBonus:= rBonus *` ✓ `1.1` ✓ OF `rBonus:= rBonus + rBonus * 0.1` Vertoon bonus in 'n dialoogblokkie ✓ geformateer as 'currency' tot 2 desimale plekke ✓	**11**	

1.4	**Knoppie [1.4 – Title case]** ***Oplossing 1: Gebruik die for.. lus*** Voeg 'n spasie by aan die einde van die sin ✓ Inisialiseer woord-string ✓ Lus ✓ van 1 tot lengte van sSentence ✓ Toets of die letter in sSentence ✓is <> aan 'n spasie is nie✓ Voeg letter van sSentance ✓by die woord string ✓ anders Skakel die eerste letter ✓ van die word om na hoofletter ✓ Vertoon die woord in redQ1_4 ✓ Maak woord-string ✓ skoon ✓ ***Alternatiewe:*** ***Oplossing 2: Gebruik die while.. lus*** ***Opossing 3: Gebruik die repeat..until lus*** ***Sien voorbeelde in die kode-afdeling*** **Konsepte:** Meganisme om die laaste woord in te sluit (1) Inialiseer woord/ teller/ tydelike (1) Lus (1) met korrekte begin, einde limiet/toestand (1) Skei elke woord in twee moontlike metodes (4 punte): *Metode 1 (voeg karakters bymekaar):* Toets as karakter (1) <> spasie (1) Kopieer karakter (1) tot by woord (1) *Metode 2 (Kopieer van sin):* Toets of karakter (1) = spasie (1) Kopieer woord (1) van indeks 1 tot spasie (1) Skakel die eerste karakter (1) van die woord na 'n hoofletter (1) Vertoon elke woord in redQ4_1 (1) Verwyder woord (1) van indeks 1 tot spasie (1) OF maak woord (1) skoon (1)	**13**	
	TOTAAL AFDELING A:	**40**	

BYLAE B

VRAAG 2: NASIENRUBRIEK – DATABASISPROGRAMMERING

SENTRUMNOMMER:		EKSAMENNOMMER:	
VRAAG	**BESKRYWING**	**MAKS. PUNTE**	**LEERDER-PUNT**
2.1	**SQL-stellings**		

2.1.1	**Knoppie [2.1.1 – Free videos]**
	`SELECT Title, Duration, UploadDate, CreatorID ✓`
	`FROM tblVideos ✓`
	`WHERE FreeVideo = True ✓`
	
	AANVAAR ook:
	`WHERE FreeVideo`
	`WHERE FreeVideo = Yes`
	`WHERE FreeVideo = -1`
		3	

2.1.2	**Knoppie [2.1.2 – Check domain]**
	`SELECT CreatorName, Email, Country`
	`FROM tblCreators ✓`
	`WHERE NOT Email ✓ LIKE "%@gmail%" ✓ AND ✓`
	`Country = "South Africa" ✓`
	
	AANVAAR ook:
	`WHERE email NOT LIKE "%@gmail.com"`
		5	

2.1.3	**Knoppie [2.1.3 – Latest videos]**
	`SELECT Top 3 ✓ UploadDate, VideoID, Title`
	`FROM tblVideos ✓`
	`ORDER BY UploadDate ✓ DESC ✓`
		4	

2.1.4	**Knoppie [2.1.4 – Videos per creator]**
	`SELECT CreatorID, ✓`
	`Count(*) ✓ AS NumberUploaded ✓`
	`FROM tblVideos ✓`
	`GROUP BY ✓ CreatorID ✓`
	`HAVING ✓ Count(*) > 5 ✓`
	
	AANVAAR ook:
	`Count(veld naam)`
		8	

2.1.5	**Knoppie [2.1.5 – Add new creator]**
	`INSERT INTO ✓ tblCreators ✓`
	`VALUES ✓ ("C011", "TRISHKALOM",`
	`"trish@rsmarketing.co.za", "South Africa") ✓`
		4	

	Subtotaal:	**24**	

VRAAG 2: NASIENRUBRIEK – VERVOLG

2.2	**Databasismanipulasie**		
2.2.1	**Knoppie [2.2.1 – Remove creator]** Gaan na die eerste rekord in tblCreators ✓ Stap met lus ('loop') deur tblCreators ✓ Toets of tblCreators['CreatorName'] = sCreatorName ✓ Gaan na die eerste rekord in tblVideos ✓ Stap met lus ('loop') deur tblVideos ✓ Toets of (tblCreators ['CreatorID']] = ✓ tblVideos ['CreatorID']) ✓ tblVideos.Delete ✓ anders ✓ tblVideos.Next ✓ Eindig lus (tblVideos) tblCreators.Delete ✓ //eindig toets (if) tblCreators.Next ✓ Eindig lus (tblCreators) **NOTE:** Lusse hoef nie genes te wees nie. Kan eers die CreatorID kry/vind en die CreatorID gebruik om die rekords van die video's uit die tblVideos te verwyder en dan die skepper uit tblCreators verwyder.	**12**	
2.2.2	**Knoppie [2.2.2 – Change upload date]** tblVideos.Edit; ✓ tblVideos ['UploadDate'] ✓ := Date ✓ tblVideos.Post; ✓ **AANVAAR ook:** DateToStr(Date) DateToStr(DateOf(Now)) FormatDateTime('yyyy/mm/dd', Now())	**4**	
	Subtotaal:	**16**	
	TOTAAL AFDELING B:	**40**	

BYLAE C

VRAAG 3: NASIENRUBRIEK – OBJEK-GEÖRIENTEERDE PROGRAMMERING

SENTRUMNOMMER:		EKSAMENNOMMER:	
VRAAG	**BESKRYWING**	**MAKS. PUNTE**	**LEERDER-PUNT**
3.1.1	**Konstruktor-metode:** Opskrif met twee parameterwaardes van tipe string ✓ Ken die regte parameterwaardes toe aan fAlbumTitle en fArtist ✓ Ken FALSE toe aan fHighRanking ✓ Ken 0 toe aan fPoints ✓	**5**	
3.1.2	**getPoints-funksie:** Funksie opskrif met heelgetalwaarde as terugstuurtipe ✓ fPoints toegeken aan result✓	**2**	
3.1.3	**updatePoints-prosedure:** opskrif van prosedure ✓ met drie heelgetalparameters✓ fPoints = ✓ albumverkope * 100 ✓ + afgelaaideLiedjies * 10 ✓ + gestroomdeLiedjies ✓	**6**	
3.1.4	**setRanking-prosedure:** Opskrif van prosedure met heelgetalparameter ✓ As iNumWeeks > 4 ✓ Stel fHighRanking op true ✓	**3**	
3.1.5	**determineStatus-funksie:** Toets of fHighRanking = true ✓ Toets of fPoints >= 5000 AND ✓ fPoints < 10000 ✓ Ken Gold toe aan status ✓ Toets of (fPoints >= 10000) ✓ Ken Platinum toe aan status ✓ Result = status ✓	**7**	
	Subtotaal: Objekklas	**23**	

VRAAG 3: NASIENRUBRIEK (VERVOLG)

VRAAG	BESKRYWING	MAKS. PUNTE	LEERDER - PUNT
3.2.1	**Knoppie [3.2.1 – Instantiate album object]** Verkry titel van album uit combo box ✓ Verkry naam van kunstenaar uit edit box ✓ *Instansieer die album-objek:* objAlbum:= ✓ TAlbum.Create✓ Gebruik twee string-argumente in die regte volgorde ✓	5	
3.2.2	**Knoppie [3.2.2 – Calculate points]** Roep updatePoints-metode ✓ Gebruik die regte drie heelgetalargumente ✓ in regte volgorde ✓ Vertoon punte in opskrif ✓ deur getPoints te roep en die waarde om te skakel na string ✓	5	
3.2.3	**Knoppie [3.2.3 – Set ranking]** Verkry die getal weke uit die input dialogue box ✓ en skakel om na heelgetal ✓ Roep die setRanking-metode ✓ met die aantal weke as argument ✓	4	
3.2.4	**Knoppie [3.2.4 – Display album details]** Vertoon die inligting in die rich edit component ✓ deur die toString-metode ✓ en die determineStatus-metode ✓ te gebruik	3	
	Subtotaal: Vormklas:	**17**	
	TOTAAL AFDELING C:	**40**	

BYLAE D

VRAAG 4: NASIENRUBRIEK – PROBLEEMOPLOSSING

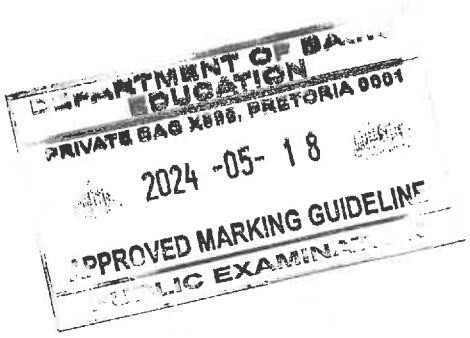
SENTRUMNOMMER:		EKSAMENNOMMER:	
VRAAG	**BESKRYWING**	**MAKS. PUNTE**	**LEERDER-PUNT**

4.1	**Knoppie [4.1 – Sort]**
	
	Lus ✓ I van 1 tot length(arrPosition) ✓
	Reg genes ✓
	Lus J van 1 tot length(arrPosition) – 1 ✓
	Toets of arrPosition[J] > ✓
	arrPosition[J + 1] ✓
	iTemp := arrPosition[J]; ✓
	arrPosition[J] := arrPosition[J + 1]; ✓
	arrPosition[J + 1] := iTemp; ✓
	
	ruil arrSongs ✓ by die regte indeks ✓
	
	Eindig J lus
	Eindig I lus
	
	Alternatief:
	for A := 1 to length(arrPosition) - 1 do (2)
	for B := A+1 to length(arrPosition) do (2)
	if (arrPosition[A] > arrPosition[B]) then (2)
	begin
	iTemp := arrPosition[A]; (1)
	arrPosition[A] := arrPosition[B]; (1)
	arrPosition[B] := iTemp; (1)
	
	sTemp := arrSongs[A];
	arrSongs[A] := arrSongs[B]; } (2)
	arrSongs[B] := sTemp;
	end;
	
	AANVAAR ook:
	In plaas van Length(arrPosition) gebruik 20
	In plaas van Length(arrPosition) - 1 gebruik 19
		11	

4.2	**Knoppie [4.2 – New chart]** Vertoon opskrifte (Song, Position en Movement) in redQ4 ✓ **Lêerhantering:** AssignFile(tFile, 'Top20.txt') ✓ Reset(tFile) ✓ Lus deur die lêer / Lus `I` van 1 tot 20 ✓ Lees liedjie uit die teklêer ✓ **Skuif-veranderinge**: Inisialiseer counter `J` as 0 ✓ Inisialiseer flag as false ✓ Lus while `J` < 20 and Flag = false ✓ Inkrementeer `J` ✓ as liedjie uit tekslêer = arrSongs[J] ✓ stel flag op true ✓ as `J > I` ✓ sMovement = intToStr(`J - I`) + ' UP' ✓ anders as `J < I` ✓ sMovement = intToStr(`I - J`) + ' DOWN' ✓ anders sMovement = 'SAME POSITION' ✓ as liedjie nie in die tekslêer gevind is nie / flag = false ✓ sMovement = 'NEW' ✓ Vertoon leidjie uit tekslêer, posisie en sMovement in redQ4 ✓ **Konsepte:** **Vertoon** Vertoon opskrifte in redQ4 (1) Vertoon liedjie, posisie en skuif in redQ4 (1) **Lêerhantering** AssignFile (1) Reset (1) Lus deur lêer (1) Lees uit lêer (1) **Skuif** *Gebruik tellers/indekse om liedjie se posisie te bepaal: (4 punte):* Inisiaiseer tellers (1) Lus (1) Inkrement J (1) Toets of liedjie in teks lêer = liedjie in arrSongs (1) Bepaal skuif - up (2) Bepaal skuif - down (2) Bepaal skuif – dieselfde posisie (1) Gebruik 'n vlag (2) om nuwe liedjie te bepaal (2)	**19**	
	TOTAAL AFDELING D:	**30**	

OPSOMMING VAN LEERDER SE PUNTE:

SENTRUMNOMMER:		LEERDER SE EKSAMENNOMMER:			
	AFDELING A	AFDELING B	AFDELING C	AFDELING D	
	VRAAG 1	VRAAG 2	VRAAG 3	VRAAG 4	GROOT-TOTAAL
MAKS. PUNTE	40	40	40	30	150
LEERDER SE PUNTE					



BYLAE E: OPLOSSING VIR VRAAG 1

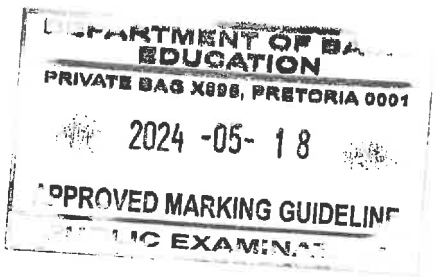
```
//=============================================================================
// 1.1 - Gender                                                        3 punte
//=============================================================================

procedure TfrmQuestion1.btn1_1Click(Sender: TObject);
begin
rgpQ1_1.Caption:='Gender';
rgpQ1_1.Items.Add('Male');
rgpQ1_1.Columns:=2;
end;

//=============================================================================
// 1.2 - Random day                                                   13 punte
// ============================================================================

procedure TfrmQuestion1.btnQ1_2Click(Sender: TObject);
var
  iRand: integer;
begin
  iRand := RandomRange(1,8);
  lstQ1_2.ItemIndex:= iRand;
  lblQ1_2.Caption := 'Day: '+IntToStr(iRand);
  if iRand  IN [1, 7] then
    begin
      edtQ1_2.Text:= 'Weekend';
    end
  else
    begin
      edtQ1_2.Text:= 'Weekday';
    end;
end;

//=============================================================================
// 1.3 - Calculate                                                    11 punte
// ============================================================================

procedure TfrmQuestion1.btnQ1_3Click(Sender: TObject);
const
  P = 8;
var
  rBonus:Real;
  iYears:Integer;
begin
  iYears := spnQ1_3.Value;
  rBonus := Power(P,iYears) * SQRT(SQR(P) / 7 * 20);
  if chkQ1_3.Checked then
  begin
   rBonus:= rBonus *1.1;
  end;
    ShowMessage(FloatToStrF(rBonus,ffCurrency,10,2));
end;
```

```
//=============================================================================
// 1.4 - Title case                                                  13 punte
// ============================================================================

procedure TfrmQuestion1.btnQ1_4Click(Sender: TObject);
var K : integer ;
    sSentence, sWord, sTitleCase : String;
begin
// Provided code
  redQ1_4.Clear;
  sSentence := InputBox('','Enter sentence','Unlock the power of
technology and ignite innovation');
  // sSentence := InputBox('','Enter sentence','Let innovation be your
guiding star as you navigate the realms of cyberspace');

// 1.4 - Title case
  // for lus - Oplossing 1
   sSentence := sSentence+' ';
  sWord := '';
  for K := 1 to Length(sSentence) do
    begin
      if sSentence[K] <> ' ' then
        sWord := sWord + sSentence[K]
      else
        begin
           sWord[1]:= Upcase(sWord[1]);
           redQ1_4.Lines.Add(sWord);
           sWord := '';
        end;
    end;
end;


  { while lus - Oplossing 2
  while sSentence <> '' do
    begin
        iPosWord:= Pos(' ',sSentence);
        if iPosWord > 0 then
          begin
             sWord:= Copy(sSentence,1,iPosWord-1);
             sWord:= UPPERCASE(sWord[1]) +
                                Copy(sWord,2,Length(sWord));
             sSentence:= Copy(sSentence,iPosWord+1,
                                Length(sSentence)-iPosWord);
          end
        else
        if iPosWord = 0 then
          begin
             sWord:= UPPERCASE(sSentence[1]) +
                                Copy(sSentence,2,Length(sSentence));
             sSentence:= '';
          end;
       redQ1_4.Lines.Add(sWord);
    end;}
```

```
{ repeat..until loop - Oplossing 3

   i := 0;
   repeat
    inc(i);
      if sSentence[i] = ' ' then
    begin
      sTemp := Copy(sSentence, 1, i);
      Delete(sSentence, 1, i);
      sTemp := UpperCase(sTemp[1]) + Copy(sTemp,2,length(sTemp));
      redQ1_4.Lines.Add(sTemp);
      i := 0;
    end;
   until sSentence = '';}

end.
```

BYLAE F: OPLOSSING VIR VRAAG 2

```
//
// ============================================================================
// 2.1 - Afdeling: SQL-stellings
// ============================================================================

// ============================================================================
//  2.1.1 - Free videos                                              3 punte
// ============================================================================

  sSQL1 := 'SELECT Title, Duration, UploadDate, CreatorID ' +
           'FROM tblVideos ' +
           'WHERE FreeVideo = True';

// ============================================================================
//  2.1.2 - Check domain                                             5 punte
// ============================================================================

  sSQL2 := 'SELECT CreatorName, Email, Country ' +
           'FROM tblCreators ' +
           'WHERE Email NOT LIKE "%@gmail.com" AND ' +
           'Country = "South Africa"';

// ============================================================================
//  2.1.3 - Latest videos                                            4 punte
// ============================================================================

  sSQL3 := 'SELECT Top 3 UploadDate, VideoID, Title ' +
           'FROM tblVideos ' +
           'ORDER BY UploadDate DESC';

// ============================================================================
//  2.1.4 - Videos per creator                                       8 punte
// ============================================================================

  sSQL4 := 'SELECT CreatorID, ' +
           'Count(*) AS NumberUploaded ' +
           'FROM tblVideos ' +
           'GROUP BY CreatorID ' +
           'HAVING Count(*)  > 5';

// ============================================================================
//  2.1.5 - Add new creator                                          4 punte
// ============================================================================

  sSQL5 := 'INSERT INTO tblCreators (CreatorID, CreatorName,
           Email, Country) '+
          'VALUES ("C011", "TRISHKALOM", "trish@rsmarketing.co.za",
                   "South Africa")';
```



```
// ============================================================================
// 2.2 - Afdeling: Delphi-kode
// ============================================================================

// ============================================================================
// 2.2.1 - Remove creator                                          12 punte
// ============================================================================

procedure TfrmQuestion2.btnQ2_2_1Click(Sender: TObject);
var
  sCreatorName : String;
begin
// 2.2.1 - Remove creator
  sCreatorName := cmbQ2_2_1.Text;
  tblCreators.First;
  while NOT tblCreators.Eof do
    begin
      if tblCreators['CreatorName'] = sCreatorName then
        begin
          tblVideos.First;
          while NOT tblVideos.Eof do
            begin
              if tblCreators['CreatorID'] = tblVideos['CreatorID'] then
                tblVideos.Delete
              else
                tblVideos.Next;
            end;
        tblCreators.Delete;
        end;
    tblCreators.Next;
    end;

// Provided code
  ShowMessage('Records deleted successfully');
end;

// ============================================================================
// 2.2.2 - Change upload date                                       4 punte
// ============================================================================

procedure TfrmQuestion2.btnQ2_2_2Click(Sender: TObject);
begin
  tblVideos.Edit;
  tblVideos['UploadDate'] := Date;
  tblVideos.Post;
end;
```

```
// ============================================================================
// {$ENDREGION}
// ============================================================================
// {$REGION 'Provided code: Setup DB connections - DO NOT CHANGE!'}
// ============================================================================

procedure TfrmQuestion2.FormClose(Sender: TObject; var Action:
TCloseAction);
begin
// Disconnects from database and closes all open connections
  dbCONN.dbDisconnect;
end;

procedure TfrmQuestion2.FormShow(Sender: TObject);
begin
// Sets up the connection to database and opens the tables.
  dbCONN := TConnection.Create;
  dbCONN.dbConnect;
  tblManufacturers := dbCONN.tblOne;
  tblProducts := dbCONN.tblMany;
  dbCONN.setupGrids(dbgManufacturers, dbgProducts, dbgrdSQL);
  pgcDBAdmin.ActivePageIndex := 0;
end;

// ============================================================================
// {$ENDREGION}
// ============================================================================

end.
```

BYLAE G: OPLOSSING VIR VRAAG 3

Objekklas:

```
unit Album_U;

interface

uses
  SysUtils, StdCtrls, Dialogs, Math;

type
  TAlbum = class(TObject)
  private
    fAlbumTitle: String;
    fArtist: String;
    fHighRanking: Boolean;
    fPoints: Integer;

  public
// Provided code
    function toString: String;
    function determineStatus: String;
    //
=============================================================================

    constructor Create(sAlbumTitle, sArtist: String);
    procedure updatePoints(iAlbumSales, iSongsDownload, iSongsStream:
                                    Integer);
    procedure setRanking(iNumWeeks: Integer);
    function getPoints: Integer;
end;

implementation

// ============================================================================
// Provided code
// ============================================================================
function TAlbum.toString: String;
begin

  Result := 'Title: ' + fAlbumTitle + #13 + 'Artist: ' + fArtist + #13 +
'High ranking: ' +
    BoolToStr(fHighRanking, true) + #13 + 'Number of points: ' +
IntToStr
    (fPoints);
end;
// ============================================================================
```

```
// ============================================================================
// 3.1.1 Constructor Create                                          5 punte
// ============================================================================

constructor TAlbum.Create(sAlbumTitle, sArtist: String);
begin
  fAlbumTitle := sAlbumTitle;
  fArtist := sArtist;
  fHighRanking := false;
  fPoints := 0;
end;

// ============================================================================
// 3.1.2 Function getPoints                                          2 punte
// ============================================================================

function TAlbum.getPoints: integer;
begin
  Result := fPoints;
end;

// ============================================================================
// 3.1.3 Procedure updatePoints                                      6 punte
// ============================================================================

procedure TAlbum.updatePoints(iAlbumSales, iSongsDownload,
  iSongsStream: Integer);
begin
  fPoints := iAlbumSales * 100 + iSongsDownload * 10 + iSongsStream;
end;
// ============================================================================
// 3.1.4 Procedure setRanking                                        4 punte
//
// ============================================================================

procedure TAlbum.setRanking(iNumWeeks: integer);
begin
  if iNumweeks > 4 then
    fHighRanking := true;
end;
```

```
// ============================================================================
// 3.1.5 Function determineStatus                                    7 punte
// ============================================================================
function TAlbum.determineStatus: String;
var
  sStatus: String;
begin
  // Provided code
  sStatus := 'None';

  // 3.1.5
  if (fHighRanking) then
    if (fPoints >= 5000) AND (fPoints < 10000) then
      sStatus := 'Gold';
    if (fPoints >= 10000) then
      sStatus := 'Platinum';
  Result := sStatus;
end;

end.
```

Hoofvormeenheid

```
unit Question3_U;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls,
Forms,
  Dialogs, StdCtrls, CheckLst, ExtCtrls, Buttons, Spin, ComCtrls, jpeg;

type
  TfrmQuestion3 = class(TForm)
    gbxQ3_2_1: TGroupBox;
    gbxQ3_2_3: TGroupBox;
    redQ3: TRichEdit;
    btnQ3_2_1: TButton;
    gbxQ3_2_2: TGroupBox;
    btnQ3_2_2: TButton;
    Panel1: TPanel;
    Panel2: TPanel;
    btnQ3_2_3: TButton;
    Image1: TImage;
    Label6: TLabel;
    edtQ3_2_1: TEdit;
    Label2: TLabel;
    spnQ3_2_1: TSpinEdit;
    chbQ3_2_1: TCheckBox;
    Label1: TLabel;c
    sedQ3_2_2: TSpinEdit;
    procedure btnQ3_2_1Click(Sender: TObject);
    procedure btnQ3_2_2Click(Sender: TObject);
    procedure btnQ3_2_3Click(Sender: TObject);
  private
    const
    arrArtist: array [1 .. 3] of string = ('SZA', 'Morgan Wallen',
                                           'People');
  public

  end;

var
  frmQuestion3: TfrmQuestion3;
  objAlbum: TAlbum;
  iSold, iDownloaded, iStreamed : integer;
implementation

{$R *.dfm}
```

```
// ============================================================================
// 3.2.1 Instantiate album object                                    5 punte
// ============================================================================

procedure TForm1.btnQ3_2_1Click(Sender: TObject);
var
  sAlbum, sArtist: String;
begin
  sAlbum := cmbQ3_2_1.Text;
  sArtist := edtQ3_2_1.Text;
  objAlbum := TAlbum.Create(sAlbum, sArtist);

  // Provided code
  ShowMessage('Album object has been instantiated successfully.');
end;

// ============================================================================
// 3.2.2 Calculate points                                            5 punte
// ============================================================================

procedure TfrmQuestion3.btnQ3_2_2Click(Sender: TObject);
begin
  objAlbum.updatePoints(iSold, iDownloaded, iStreamed);
  lblQ3_2_2.Caption := IntToStr(objAlbum.getPoints);
end;

// ============================================================================
// 3.2.3 Set ranking                                                 4 punte
// ============================================================================

procedure TfrmQuestion3.btnQ3_2_3Click(Sender: TObject);
var
  iNumWeeks : integer;
begin
  iNumWeeks := StrToInt(InputBox('Number of weeks ranked 1', 'Enter
number of weeks', ''));
  objAlbum.setRanking(iNumWeeks);
end;

// ============================================================================
// 3.2.4 Display album details                                       3 punte
// ============================================================================

procedure TForm1.btnQ3_2_4Click(Sender: TObject);
begin
 redQ3.Clear;
 redQ3.Lines.Add(objAlbum.toString);
 redQ3.Lines.Add('Status of album: ' +
 objAlbum.determineStatus);end;
```

```
// Provided code - do not change
// ================================================================

procedure TfrmQuestion3.cmbQ3_2_1Change(Sender: TObject);
begin
  edtQ3_2_1.Text := arrArtist[cmbQ3_2_1.ItemIndex + 1];
  iSold := Random(100);
  iDownloaded := Random(500);
  iStreamed := Random(500);

  edtSold.Text := IntToStr(iSold);
  edtDownloaded.Text := IntToStr(iDownloaded);
  edtStreamed.Text := IntToStr(iStreamed);end;
// ================================================================

end.
```

BYLAE H: OPLOSSING VIR VRAAG 4

```
unit Question4_U;

interface
uses
  Windows, Messages, SysUtils, Variants,
  Classes, Graphics,
  Controls, Forms, Dialogs, StdCtrls, ComCtrls,
  ExtCtrls, jpeg, math;
type
  TfrmQuestion4 = class(TForm)
    Panel1: TPanel;
    Panel2: TPanel;
    btnQ4_2: TButton;
    redQ4: TRichEdit;
    btnDisplay: TButton;
    GroupBox1: TGroupBox;
    btnQ4_1: TButton;
    Image1: TImage;
    GroupBox2: TGroupBox;
    GroupBox3: TGroupBox;
    procedure btnQ4_2Click(Sender: TObject);
    procedure btnDisplayClick(Sender: TObject);
    procedure btnQ4_1Click(Sender: TObject);
    procedure FormShow(Sender: TObject);
  private
    procedure DisplayArrays;
    { Private declarations }
  public
    { Public declarations }
  end;
var
  frmQuestion4: TfrmQuestion4;

  arrSongs: array [1 .. 20] of String = (
    'Castle of Hope', 'Deep Green Hills', 'Backseat Kiss', 'Earning
Nocturno', 'Edges of Dawing', 'Free Future', 'Heart Hymn', 'Heroic
Flavor', 'Me and You', 'New York Dirt', 'Not Night', 'Adagio', 'Running
Study', 'So Hard Spring', 'Sound of Illusion', 'The Celebration',
'Unexpected Skies', 'Wait for Friends', 'Warm Heart', 'Winter Friends');

  arrPosition: array [1 .. 20] of integer = (
    4, 6, 11, 20, 2, 12, 19, 5, 1, 10, 14, 13, 17, 9, 3, 18, 16, 7, 8,
15);

implementation

{$R *.dfm}
```

```
// ============================================================================
// 4.1 - Sort                                                      11 punte
// ============================================================================

procedure TfrmQuestion4.btnQ4_1Click(Sender: TObject);
var
  I, iTemp: integer;
  J: integer;
  sTemp: String;
begin
// Provided code
  redQ4.Clear;

// Question 4.1

  for I := 1 to length(arrPosition) do
  begin

    for J := 1 to length(arrPosition) - 1 do
    begin

      if arrPosition[J] > arrPosition[J + 1] then
      begin

        iTemp := arrPosition[J];
        arrPosition[J] := arrPosition[J + 1];
        arrPosition[J + 1] := iTemp;

        sTemp := arrSongs[J];
        arrSongs[J] := arrSongs[J + 1];
        arrSongs[J + 1] := sTemp;

      end;

    end;

  end;

  DisplayArrays;

end;
```

```
// ============================================================================
// 4.2 New chart                                                    19 punte
// ============================================================================

procedure TfrmQuestion4.btnQ4_2Click(Sender: TObject);
var
  tFile: TextFile;
  J, iNew: integer;
  bFound: boolean;
  sNewSong, sMsg: String;

// Variables for Alternative 2 and 3
//  tFile: TextFile;
//  arrNewSongs: array [1 .. 20] of String;
//  I: integer;
//  J, iDiff, iPos: integer;
//  bFlag, bFound: boolean;
//  sLine, sOutput: String;
begin
  // Question 4.2

  redQ4.Clear;
  AssignFile(tFile, 'Top20.txt');
  Reset(tFile);

  redQ4.lines.add('Song' + #9 + 'Position' + #9 + 'Movement');

  for iNew := 1 to 20 do
  begin
    readln(tFile, sNewSong);
    J := 0;
    bFound := false;
    while (J < 20) AND (NOT bFound) do
    begin
      inc(J);
      if sNewSong = arrSongs[J] then
      begin
        bFound := true;
        if J > iNew then
          sMsg := IntToStr(J - iNew) + ' UP'
        else if iNew > J  then
          sMsg := IntToStr(iNew - J) + ' DOWN'
        else
          sMsg := 'SAME POSITION';
        end;
      end;
      if NOT bFound then
        sMsg := 'NEW';

      redQ4.lines.add(sNewSong + #9 + IntToStr(iNew) + #9 + sMsg);

  end;
end;
```

```
{ //Alternative 2
redQ4.Clear;

  AssignFile(tFile, 'Top20.txt');

  try
    reset(tFile);

    for I := 1 to 20 do
    begin

      readln(tFile, arrNewSongs[I]);

    end;
    redQ4.lines.add('Song' + #9 + 'Position' + #9 + 'Movement');

    for I := 1 to length(arrNewSongs) do
    begin

      J := 0;
      bFlag := true;
      while (J < 20) AND (bFlag) do
      begin
        inc(J);
        if arrNewSongs[I] = arrSongs[J] then
        begin
          if J - I > 0 then
          begin
            sLine := arrNewSongs[I] + #9 + intTostr(I) + #9 + '(' +
                     intTostr(abs(J - I)) + ' UP)';
          end
          else if J - I < 0 then
          Begin
            sLine := arrNewSongs[I] + #9 + intTostr(I) + #9
                     + '(' + intTostr(abs(J - I)) + ' DOWN)';
          End
          else
          begin
            sLine := arrNewSongs[I] + #9 + intTostr(I) + #9
                     + '(SAME POSITION)';
          end;
          bFlag := false;
        end
        else
        begin
          sLine := arrNewSongs[I] + #9 + intTostr(I) + #9 + '(NEW)';
        end;
      end;
      redQ4.lines.add(sLine);
    end;
  except
    ShowMessage('File not found');
    Application.Terminate;
  end;
}
```

```
{ //Alternative 3
AssignFile(tFile,'Top20.txt');
 Reset(tFile);
 j:=0;
 while not eof(tFile) do
 Begin
  Readln(tFile,sLine);
  bFlag:= False;
  Inc(j);
  i:=0;
  sOutput:= sLine+#9+IntToStr(j);
   while(bFlag = false) AND (i<20) do
  begin
     Inc(i);
     if arrSongs[i] = sLine then
     begin
        bFlag := True;

    iDiff :=  i - j;
    if iDiff < 0 then
    begin
      sOutput := sOutput+ #9+'('+IntToStr(ABS(iDiff))+' DOWN)';
    end
    else  if  iDiff > 0 then
    begin
      sOutput := sOutput+ #9+'('+IntToStr(iDiff)+' UP)';
    end
    else   if  iDiff = 0 then
    begin
       sOutput := sOutput+ #9+'SAME POSITION';
    end ;

  end; //if bflag - true
  end; //while for array

 if bFlag = False then
  begin
     sOutput:= sOutput+#9+'NEW';
  end;

  redQ4.Lines.Add(sOutput);
 End;//while  for file
 CloseFile(tFile);
end; }
```

```
// ============================================================================
// Provided code
// ============================================================================
procedure TfrmQuestion4.FormShow(Sender: TObject);
begin
  redQ4.Paragraph.TabCount := 3;
  redQ4.Paragraph.Tab[0] := 0;
  redQ4.Paragraph.Tab[1] := 120;
  redQ4.Paragraph.Tab[2] := 180;
end;

procedure TfrmQuestion4.DisplayArrays;
var
  I: Integer;
begin
  // Provided code
  redQ4.lines.add('TOP CHARTS');
  redQ4.lines.add(format('%-20s%-15s%-5s', ['Songs', 'Artist',
'Position']));
  for I := 1 to length(arrSongs) do
    redQ4.lines.add(format('%-20s%-15s%-5d', [arrSongs[I],
arrArtists[I], arrPosition[I]]));
end;

end.
//============================================================================
  End of provided code
//============================================================================
```