

ANNEXURE F: SOLUTION FOR QUESTION 3

```

unit Question3_U;

interface

uses
  Windows, Messages, SysUtils, Variants, Classes, Graphics, Controls, Forms,
  Dialogs, ExtCtrls, StdCtrls, ComCtrls, pngimage;

type
  TfrmQ3 = class(TForm)
    redOutput: TRichEdit;
    GroupBox1: TGroupBox;
    btnQ3_1: TButton;
    GroupBox2: TGroupBox;
    cmbStaff: TComboBox;
    Panel1: TPanel;
    Image1: TImage;
    procedure btnQ3_1Click(Sender: TObject);
    procedure Display;
    procedure cmbStaffChange(Sender: TObject);
  private
    { Private declarations }
  public
    { Public declarations }
  end;

// =====
// Provided code: Declarations
// =====
const
  iMaxRow = 3;
  iMaxCol = 6;

var
  frmQ3: TfrmQ3;
  arrStaff: array [1 .. 6] of String = (
    'Trevor',
    'Nkosi',
    'Tamzin',
    'Anette',
    'Bongi',
    'Simon'
  );

  arrPlacements: array [1 .. 3, 1 .. 6] of String =
    (('Nkosi', 'Simon', 'Anette', 'Bongi', 'Tamzin', 'Trevor'),
    ('Anette', 'Tamzin', 'Simon', 'Trevor', 'Bongi', 'Nkosi'),
    ('Bongi', 'XXXXX', 'Trevor', 'Nkosi', 'Nkosi', 'Tamzin'));

implementation

{$R *.dfm}

```

```
// =====  
// Provided code: Procedure Display  
// =====  
procedure TfrmQ3.Display;  
Var  
    sLine: String;  
    iCnt, iR, iC: integer;  
begin  
    redOutput.Clear;  
    sLine := '' + #9#9;  
    for iCnt := 1 to iMaxCol do  
        begin  
            sLine := sLine + 'Day ' + IntToStr(iCnt) + #9#9;  
        end;  
        redOutput.Lines.Add(sLine);  
  
        for iR := 1 to iMaxRow do  
            begin  
                sLine := 'Library ' + IntToStr(iR) + #9;  
                for iC := 1 to iMaxCol do  
                    begin  
                        sLine := sLine + arrPlacements[iR, iC] + #9#9;  
                    end;  
                    redOutput.Lines.Add(sLine);  
                end;  
            end;  
        end;  
end;  
  
// =====  
// Provided code: FormActivate  
// =====  
  
procedure TfrmQ3.FormActivate(Sender: TObject);  
Begin  
    Display;  
end;  
  
// =====  
// Question 3.1  
// =====  
procedure TfrmQ3.cmbStaffChange(Sender: TObject);  
Var  
    iRow, iColumn: Integer;  
    sName: String;  
begin  
  
    sName := cmbStaff.Text;  
    redOutput.Lines.Add(#13 + sName + ''s ' + 'Schedule');  
    for iColumn := 1 to iMaxCol do  
        begin  
            for iRow := 1 to iMaxRow do  
                begin  
                    if arrPlacements[iRow, iColumn] = sName then  
                        redOutput.Lines.Add('Day ' + IntToStr(iColumn) + '-Library#' + IntToStr  
                            (iRow));  
                end;  
            end;  
        end;  
    end;  
end;
```

```
// =====  
// Question 3.2  
// =====  
procedure TfrmQ3.btnQ3_2Click(Sender: TObject);  
Var  
    iRow, iColumn, iNum, iDayClosed: Integer;  
begin  
    iDayClosed := StrToInt(InputBox('Library 3 closed',  
        'Enter the day number when library 3 is closed', '1'));  
    for iRow := 1 to iMaxRow do  
        begin  
            for iColumn := 1 to iMaxCol do  
                begin  
  
                    case iRow of  
                        1:  
                            arrPlacements[iRow, iColumn] := arrStaff[iColumn];  
                        2:  
                            arrPlacements[iRow, iColumn] := arrStaff[7 - iColumn];  
                        3:  
                            if iColumn = iDayClosed then  
                                begin  
                                    arrPlacements[iRow, iColumn] := 'XXXXX';  
                                end  
                            else  
                                begin  
                                    repeat  
                                        iNum := Random(6) + 1;  
                                        until ((arrPlacements[1, iColumn] <> arrStaff[iNum])) AND  
                                            ((arrPlacements[2, iColumn] <> arrStaff[iNum]));  
                                    arrPlacements[iRow, iColumn] := arrStaff[iNum];  
                                end;  
                            // case  
                        end; // else  
                    end; // iColumn  
                end; // iRow  
  
                // Code provided  
                Display;  
  
            end;  
  
        end.  
    end.
```