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;

// ============================================================================
// 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;
```

```
// ============================================================================
// 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.
```