Form 6 ICT SBA – Case Study 1
Mark Checking System

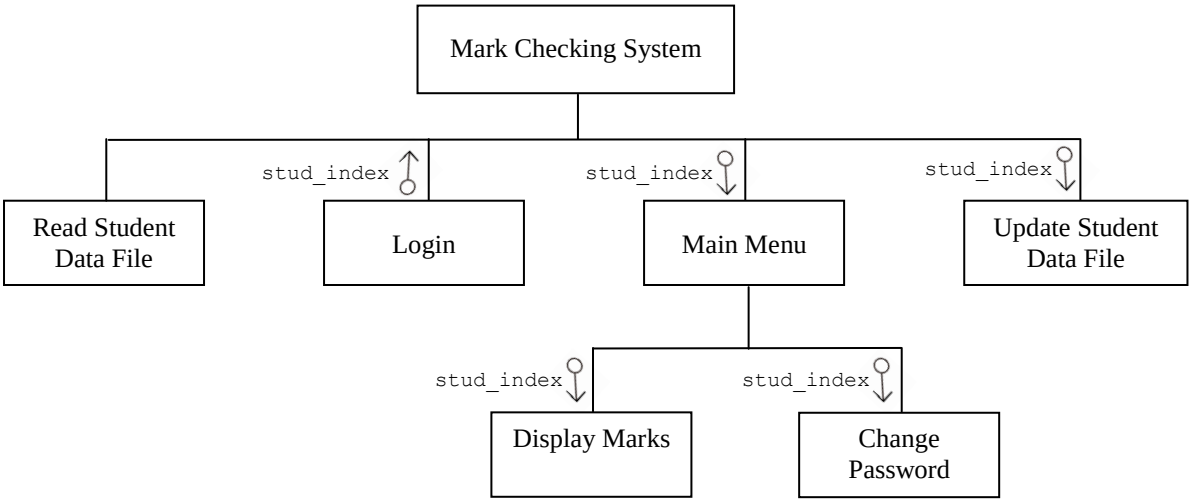
Form 6 _____ Name _____ No. _____ Date_____

Mr. C wants to design a Mark Checking System for his students to check their marks. The system should provide the following functions:

1. Login function to authenticate and identify students (users).
2. Allow students to change their passwords.
3. Allow students to check their marks after login.

System Design

- The system consists of the following modules:



- There is one data file '`students.txt`' storing the information of students.
  Structure of data file:

Field	Data type	Example
Student ID	string	`s001`
Password	string	`1234`
Name	string	`Au Sham Ki`
Chi Mark	integer	`81`
Eng Mark	integer	`42`
Mat Mark	integer	`59`

Sample file:

```
s001
1234
Au Sham Ki, Bobby
81
42
59
s002
1234
Au Yue, Joanne
63
78
76
.........
```

- Run the program '`MarkSystem.exe`' to see the sample output.

Complete the Pascal program below.

```
program MarkSystem;

uses crt;

const
  max_stud = 100;

var
  studid : array[1..max_stud] of string;
  studpw : array[1..max_stud] of string;
  studname : array[1..max_stud] of string;
  mark_chi : array[1..max_stud] of integer;
  mark_eng : array[1..max_stud] of integer;
  mark_mat : array[1..max_stud] of integer;
  num_stud : integer;
  stud_index : integer;
```

Arrays for storing students' info

For storing total number of student records

For locating the student after login

```
procedure read_students;  { Reading data from students.txt file }
var
  i : integer;
  f : text;
begin
  assign(f, 'students.txt');
  reset(f);
  i := 0;
  while not eof(f) do
    begin
      i := i + 1;
      readln(f, studid[i]);
      [                                   ]
    end;
  num_stud := [                           ] ;
  close(f)
end;


procedure store_students;   { Storing data to students.txt file }
var  i : integer;
     f : text;
begin
  [                                       ]
 for i := 1 to num_stud do
    begin
      [                                   ]
      writeln(f, mark_chi[i]);
      writeln(f, mark_eng[i]);
      writeln(f, mark_mat[i])
    end;
    [                                     ]
end;
```

```
procedure change_password(stud_index : integer);
var
  newpass : [                ] ;
begin
  clrscr;
  writeln;
  write('        Please enter your new password       : ');
  readln(newpass);
  studpw[stud_index] := [                          ] ;
  store_students;
  writeln;
  writeln('        Password changed.');
  writeln;
  write('        Press <Enter> to return. ');
  readln
end;

procedure display_marks(stud_index : integer);
begin
  clrscr;
  writeln;
  writeln('        Your Examination Results: ');
  writeln;
  writeln('        ------------------------------------ ');
  writeln;
  writeln('          Student ID  : ', [                                ] );
  writeln;
  writeln('          Name        : ', [                                ] );
  writeln;
  writeln('          Your Marks : ');
  writeln;
  writeln('                        Chinese     : ', [                                ] );
  writeln;
  writeln('                        English     : ', [                                ] );
  writeln;
  writeln('                        Mathematics : ', [                                ] );
  writeln;
  writeln;
  writeln;
  write('         <<< Press <Enter> to return. >>>');
  readln
end;

procedure main_menu(stud_index : integer);
var
  choice : integer;
begin
  repeat
    clrscr;
    writeln;
    writeln('                        Marks Checking System ');
    writeln('                              Main Menu');
    writeln;
    writeln('               ------------------------------------');
    writeln('                     1. Display marks');
    writeln('                     2. Change password');
    writeln('                     3. Quit');
    writeln('               ------------------------------------');
    writeln;
    write('                Enter choice: ');
    readln(Choice);
    writeln;
    case choice of
      1 : [                                ] ;
      2 : [                                ] ;
    end;
  until [                    ] ;
end;
```

```
procedure login(var stud_index : integer);
var
  userid, password : string;
  found : boolean;
  i : integer;
begin
  clrscr;
  writeln;
  writeln;
  writeln('                          Marks Checking System                ');
  writeln;
  writeln('                  * * * * * * * * * * * * * * * * * * * * *      ');
  writeln('                  *                                       *      ');
  writeln('                  *                 LOGIN                 *      ');
  writeln('                  *                                       *      ');
  writeln('                  * * * * * * * * * * * * * * * * * * * * *      ');
  writeln;
  write('                        UserID : ');
  readln(userid);
  writeln;
  write('                      Password : ');
  readln(password);
  writeln;
  writeln;
  found := false;
  i := 0;
  while (i < num_stud) and [                          ] do
    begin
      i := i + 1;
      if ( [                ] = studid[i]) and (password = [                ] ) then
        begin
          found := [                          ] ;
          stud_index := i
        end
    end;
  if not found then
    begin
      stud_index := 0;
      writeln(''':20,'> > > Invalid UserID or Password!');
      write(''':20,'> > > Press <Enter> to refresh.');
      readln
    end;
end;


begin  (* main body *)
  read_students;
  repeat
    login(stud_index);
    if stud_index <> 0 then
     main_menu(stud_index)
  until false;
  readln
end.
```

- **Bonus:**
  1. Find out how to hide the password, i.e. displayed as '*' during input. (*Hint: Use Google.*)
  2. Perform verification check (input password twice) when changing password.