School of Computing and Information Systems

PROGRAMME: BSC ICT, BSC APPLIED BUSINESS COMPUTING

ABC103 - INTRODUCTION TO PROGRAMMING USING C# Year 1 Semester 2

ASSIGNMENT

Hand Out Date: 22 March 2023 **Hand In Date : 22 May 2023**

Total Marks: 100

Instructions to candidates

1. Candidates must attempt ALL questions.
2. You are to make your submission on turn-it-in. You may consult your tutor/lecturer on how to do it.
3. Your Assignment submission must have a cover page with full student details. The cover page will be provided to students when the Assignment is issued out. On the cover page, you will find an acknowledgement statement which must be signed by the student as proof or admission or affirmation of one own's work being submitted.
4. Ensure that you have an account on turn-it-in by going to www.turnitin.com. Use the credentials provided for your account, for accessing this system. If you do not have your turn-it-in account credentials get hold of the module tutor/lecturer as soon as possible.
5. If there is program code to be submitted, ensure that your folder has been created by your lecturer on the submission Server i.e., Sechaba, and you are able to submit inside the folder.
6. Any work with a plagiarism level above 30 % will not be marked. It is your responsibility to make sure that the plagiarism level detected in your work is within this level. Monitor the plagiarism rating of your work on regular bases. If you share your solution with others, chances of the plagiarism rising above this level are high.
7. It is your responsibility to ensure that the C# module is in turn-it-in and that you are able to see it before the submission date, so you can submit your report on the module link/bin. Consult with your tutor/lecturer if this is not the case.
8. Save the file name using the following convention or format surname_firstname_cohort_assignment code.docx or .pdf e.g., charity_jones_2023_abc103.docx
9. Note that this assignment may be subject to change or amendment and that care shall be taken to ensure that any such amendment or change shall not prejudice or disadvantage you/the candidate/the student.

Appendix 1: Assignment submission cover sheet

ASSIGNMENT SUBMISSION COVER SHEET

Student Id:

Student names:

Student email:

Cohort:

Assignment title:

Submission Date:

Study Programme

Year of Study:

Intellectual property statement

By checking the box below, I certify that this assignment is my own work and is free from plagiarism. I understand that the assignment may be checked for plagiarism by electronic or other means and may be transferred and stored in a database for the purposes of data-matching to help detect plagiarism. The assignment has not previously been submitted for assessment in any other unit or to any other institution.

I ____

have read and understood the Botswana Accountancy College plagiarism guidelines policy.

☐ Agree

Signature……………………………………

Date…………………………………………

NOTES TO THE STUDENTS

This assignment is supposed to be done in stages. The stage submissions can given to the tutor at given periods in your tutorial sessions or on appointment basis. The tutor can see the work for certain components in the assignment to verify you are on the right track and even require you to change your solution if necessary. All work should be done to your best level so that you earn good grades.

The final submission that will be made up of **All** the corrected work that has been discussed with the tutor. This will be assessed and graded accordingly. This will be submitted on turn-it-in for plagiarism and marking. Your components should be labeled accordingly for you to earn marks. **Part A** contribute **50%** to overall Assignment mark, **Part B** contribute **50%** to overall Assignment mark.

SCENARIO: STUDENT ASSESSMENT GRADE BOOK (SAGB)

SAGB is a program for the school of computing for assessing students, determining grades and printing results. Suppose you have been approached by the **school of computing** as a Systems analyst and Designer. The school wants you to develop a system for them to use to assess students and print results. After a long interview with the representatives, they finally settled for the following features on the small system, that they want you to design and implement. The representatives agreed on C# programing language to be used and the system to be able to run on college computers that runs on Windows.

System Features

Feature 1. The system should allow the Admin to create their own account and other staff member accounts to enable them to use the system. They will provide staffid, email, password, firstname, surname, gender, address, cellno, position, dateregistered. These details should be saved as : *staffid#email**#**password**#**firstname**#**surname#gender#cellno#position#dateregistered* in a text file called **users.txt**.
Staff positions can be: Admin, Lecturer, Admin Assistant, Registrar

Feature 2. The system should allow the Registrar to register all students for a given module. The details are stored in a file called **students.txt** in the following format:
studentid#firstname#surname#gender#dob#cellno#program#level#module
This semester the students are doing Programming with C#(ABC103) only. The other modules are Web and Multimedia Development(CSE104), and Systems Development(ABC100).

Feature 3. The system should store the assessment model weights in a file called **assessmentmodel.txt** in the following format:

AssTest(%)#Assignment(%)#CourseWork(%)#FinalExam(%)

Table 1 - Assessment Model

ModuleMark(100%)		
CourseWork (40%)		Final Exam (60%)
AssessmentTest(40%)	Assignment(60%)	Final Exam (60%)

Feature 4. The system should store the Grade Computation criteria in a file called **settings.txt** in the following format:

Markfrom#markto#grade

Table 2 - Grade computation criteria

StudentGrade		
Mark From	Mark To	Grade
0	34	Fail
35	39	Supp
40	59	Pass
60	69	Credit
70	79	Merit
80	100	Distinction

Feature 5. The system should allow a lecturer to enter module marks for AssessmentTest, Assignment, and Final Exam. On saving the marks the ModuleMark and Grade should be computed automatically. Module Mark is computed using the assessment model described in Feature 3 above, and rounded to the nearest whole number.

Student Grade is evaluated using the Grade Computation criteria described in Feature 4 above.

Student Marks should be stored in a file called **marks.txt** in the following format:
studentid#module#test#assignment#finalexam#modulemark#grade#daterecorded#staffid

Feature 6. The system should allow the Lecturer, Registrar and Admin Assistant to view student results. Student Results may be presented in the format below.

Table 3 – Student Results Preferred Format

StudID	Title	Fullname	Module	Test	Assignment	Exam	ModMark	Grade

Feature 7. The system should allow the Lecturer, Registrar, and Admin Assistant to view module performance statistics in the format below.

Table 4 – Module Performance Statistics

Module Performance Statistics	
ModuleCode	
ModuleName	
TotalStudents	
TotalWritten	
TotalPassed	
TotalFailed	
PassRate(%)	
FailureRate(%)	

Part A: System Documentation Instructions (100 Marks)

Use the above mentioned features to attempt questions that follow. You are supposed to draw the flow charts and write the pseudocode using Microsoft word. All the answers must be clearly labeled.

Compile a system documentation based on the scenario above and focusing on the features described.

1) Write a brief introduction about the proposed solution to the scenario above. **[05 Marks]**
2) Describe your solution to the problem in terms of top-down approach and sub systems or modules that make up the whole system, **divide and conquer** Approach using a suitable hierarchy well labelled diagram. **[10 Marks]**

3) Write down the pseuducode that shows how you will implement **Feature 1**. Draw the flow chart for this feature. Elaborate on your solution. **[10 Marks]**

   Pseudocode:[*5]*

   1 mark for meaningful variable declaration

   1 mark for use of methods

   2 Marks for logic

   1 mark for clean code

   Flow chart*[5]*

   1 mark for start-stop

   1 mark for use prompts and input output

   2 mark for correct logic

   1 mark for clean flow chart

4) Write down the pseuducode that shows how you will implement **Feature 2**. Draw the flow chart for your answer. **[10 Marks]**

   Pseudocode:[*5]*

   1 mark for meaningful variable declaration

   1 mark for use of methods

   2 Marks for logic

   1 mark for clean code

   Flow chart*[5]*

   1 mark for start-stop

   1 mark for use prompts and input output

   2 mark for correct logic

   1 mark for clean flow chart

5) Write down the pseuducode that shows how you will implement **Feature 5.** Draw the flow chart for your answers. **[30 Marks]**

a) Module Mark Computation **[10 Marks]**
b) StudentGrade Evaluation **[10 Marks]**
c) Writing Marks to File **[10 Marks]**

For each part (a, b, c):

***Pseudocode**:[5]*
1 mark for meaningful variable declaration
1 mark for use of methods
2 Marks for logic
1 mark for clean code

***Flow chart**[5]*
1 mark for start-stop
1 mark for use prompts and input output
2 mark for correct logic
1 mark for clean flow chart

6) Write down the pseudocode that shows how you will implement **Feature 6**. Draw the flow chart for this feature. Elaborate on your solution. **[10 Marks]**

// Reading from file and linking files
***Pseudocode**:[5]*
1 mark for meaningful variable declaration
1 mark for use of methods
2 Marks for logic
1 mark for clean code

***Flow chart**[5]*
1 mark for start-stop
1 mark for use prompts and input ouput
2 mark for correct logic
1 mark for clean flow chart

7) Write down the pseudocode that shows how you will implement **Feature 6**. Draw the flow chart for this feature. Elaborate on your solution. **[15 Marks]**
// Reading files
***Pseudocode**:[5]*
1 mark for meaningful variable declaration
1 mark for use of methods
2 Marks for logic
1 mark for clean code

// computations for performance statistics

***Pseudocode**:[5]*

1 mark for meaningful variable declaration

1 mark for use of methods

2 Marks for logic

1 mark for clean code

***Flow chart**[5]*

1 mark for start-stop

1 mark for use prompts and input ouput

2 mark for correct logic

1 mark for clean flow chart

8) Good presentation of work. **[05 Marks]**

9) Well referenced work. **[05 Marks]**

Part B System Implementation [100 Marks]

GUI

Text highlighted in blue color is a suggestion for possible use of dropdowns, such information may also be stored in files.

a) Login Form. **[5 marks]**

- i. Use of appropriate control (1)
- ii. Password hide and reveal feature (2)
- iii. Informative (2)

b) Registration **[10 marks]**

- i. Use of appropriate control (3)
- ii. Causes validation events (3)
- iii. Look and Feel (2)
- iv. Informative (2)

c) Capture Marks **[10 marks]**

- i. Use of appropriate control (3)
- ii. Causes validation events (3)
- iii. Look and Feel (2)
- iv. Informative (2)

d) Module Performance Statistics Form. **[5 marks]**

- i. Use of appropriate control (1)
- ii. Look and Feel (2)
- iii. Informative (2)

[Total 30 Marks]

Code Logic

a) Feature 1 **[15 marks]**

- i. Use of a separate class from Form (5)
- ii. Use method correctly (3)
- iii. Consume class with object (3)
- iv. Exception handling & comments (4)

b) Feature 5 **[15 marks]**

- i. Use of a separate class from Form (5)
- ii. Use method correctly (3)
- iii. Consume class with object (3)
- iv. Exception handling & comments (4)

c) Feature 6 **[15 marks]**

i.	Use of a separate class from Form	(5)
ii.	Use method correctly	(3)
iii.	Consume class with object	(3)
iv.	Exception handling & comments	(4)

d) Feature 7 **[5 marks]**

i.	Code reuse	(2)
ii.	Use methods	(2)
iii.	Correct display of performance statistics	(1)

[Total 50 Marks]

Presentation [20 marks]

a)	General knowledge of work ownership	(5)
b)	Technical knowledge on the presented work	(5)
c)	Practical skills on fixing errors and debugging	(5)
d)	Presentation skills	(5)

[Total 20 Marks]

~ ~ ~ END OF ASSIGNMENT ~ ~ ~

Appendix : Data To Be Used For Testing

Table 5 - Staff (Users)

StaffID	Email	Password	Firstname	Surname	Gender	CellNo	Position	DateReg
100	admin@scis.bw	pass@123	System	Admin	M	71710000	Admin	1/1/2020
200	registrar@scis.bw	pass@123	Elias	Emmanuel	M	72720000	Registrar	1/2/2020
300	alice@scis.bw	pass@123	Alice	Johnson	F	74740000	Admin Assistant	1/3/2020
400	laone@scis.bw	pass@123	Laone	Malema	F	75750000	Lecturer	1/4/2020
500	kagiso@scis.bw	pass@123	Kagiso	Nonyane	M	76760000	Lecturer	1/5/2020
600	prosper@scis.bw	pass@123	Prosper	Smith	M	77770000	Lecturer	1/6/2020

Table 6 - Students.txt

```
abc22-012#Sidonie Simone#Karesaza#F#36898#26775183880#ABC#1#ABC103
abc22-013#Reneetswe#Letsoalo#F#36899#26772160858#ABC#1#ABC103
abc22-015#Sylvester#Sebobile#M#36900#26772581243#ABC#1#ABC103
abc22-018#Orefile Cassy#Legaswa#F#36901#26778080670#ABC#1#ABC103
abc21-016#Gaolese#Sefo#F#36902#26775219530#ABC#1#ABC103
abc21-025#Denzel#Lefaphane#M#36903#26776969046#ABC#1#ABC103
ict22-001#Katlo Chantel#Sefawe#F#36904#26774720010#ICT#1#ABC103
ict22-002#Taolo#Wetshootsile#M#36905#26774534094#ICT#1#ABC103
ict22-003#Ashley Aobakwe T#Lethugile#F#36906#26771712875#ICT#1#ABC103
ict22-004#Wilson Mafika#Mokgadi#M#36907#26777366620#ICT#1#ABC103
ict22-005#Refilwe#Molonda#F#36908#26777700768#ICT#1#ABC103
ict22-008#Holly#Molefhe - Mangadi#F#36909#26771842229#ICT#1#ABC103
ict22-010#Disemebala Onalerona#Olefile#F#36910#26777479200#ICT#1#ABC103
ict22-011#Kenneth Junior#Zibochwa#M#36911#26771726285#ICT#1#ABC103
ict22-013#Beatrice Chedza Tsitsi#Nshakazhogwe#F#36912#26776725816#ICT#1#ABC103
ict21-004#Gofiwa Will Tlotlo#Koosimile#F#36913#26776584503#ICT#1#ABC103
```

Table 7 - Marks

StudID	Module	Test	Assignment	FinalExam
abc22-003	ABC103	40	50	56
abc22-004	ABC103	40	40	35
abc22-005	ABC103	45	52	30
abc22-006	ABC103	75	55	89
abc22-007	ABC103	35	49	40
abc22-009	ABC103	60	35	45
abc22-012	ABC103	81	25	60
abc22-013	ABC103	15	50	85
abc22-015	ABC103	45	48	65
abc22-018	ABC103	58	68	75
abc21-016	ABC103	75	75	75
abc21-025	ABC103	82	90	82
ict22-001	ABC103	50	60	55
ict22-002	ABC103	40	48	48
ict22-003	ABC103	38	70	65
ict22-004	ABC103	35	34	34
ict22-005	ABC103	45	50	80
ict22-008	ABC103	38	40	58
ict22-010	ABC103	45	60	36
ict22-011	ABC103	60	80	52
ict22-013	ABC103	70	85	40
ict21-004	ABC103	30	35	35