

# Distributed Systems & Co-op Computing

## Assignment 1 - Java RMI based Assessment System

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This report describes all the functionality of the exam center application. Upon creation of the Exam engine, predefined assessment, student and question objects are created.

### Login

This takes in the Client's student ID and their password. The Server reads the Client's student ID and cycles through the list of saved students, attaining the password associated with the student ID that was inserted.

If this password matches the password entered by the Client, the Server creates a session. If a session already exists, the Server gives the Client the existing auth token. If it is a new session, a new auth token is given using hashCode function.

If the password given by the Client does not match the Server's existing password, an Unauthorized Access error is thrown and the Client is denied access.

Once the Client is given access, they are met with a menu of options. This includes All (views all available Assignments), Get (which downloads an available Assignment), Edit (which allows the Assignment to be Edited), Submit (which submits the Assignment), Check (which checks when each Assignment deadline is), Help (which displays all of the previous commands) and End (which ends the Session).

```
----- Welcome to Exam Center! -----
```

```
Lets Login
```

```
Please enter your Student ID: 1
```

```
Please enter your password: mypass
```

```
You are Logged in
```

```
----- Welcome to Exam Center! -----
```

```
Lets Login
```

```
Please enter your Student ID: 7
```

```
Please enter your password: mypass
```

```
User does not exist!
```

```
----- Welcome to Exam Center! -----
```

```
Lets Login
```

```
Please enter your Student ID: 1
```

```
Please enter your password: wrongpass
```

```
Incorrect Password!
```

## Help – list of commands

Help displays the list of commands that are available to the user. This menu can be retrieved at any time by using the help command.

```
Please input a command: help

---- Available commands ----
To get all available Assessments = all
To download an Assessment = get
To edit an Assessment = edit
To submit an Assessment = submit
To print out commands = help
To end the session = end
-----
```

## View all available Assessments

To view all of the available Assessments, the Client must use the All command. The Server takes in Auth Token and the Client's student ID.

The Server gathers the assessments related to this student ID and returns the course code, the closing date and the number of questions related to the assessment.

If the Server can not find the Client's student ID related to any assessment, it throws a No Matching Assessment error.

```
Please input a command: all

[
  ----- Course code: CT414
  Closing Date: 2020-02-17
  Number of Questions: 3,
  ----- Course code: CT413
  Closing Date: 2020-01-17
  Number of Questions: 3]
```

# Download Assessment

## Download Assessment

To download an available Assessment, the Client must use the Get command. The Server takes in Auth Token and the Client's student ID and course code. The Server checks if the session is still valid using the Auth token.

The Server cycles through the Assessments, checking the student ID and course code of the Client against the course codes of the available assessments. The Server then checks if the closing date of the Assessment. If the current date is past the closing date of the Assessment, an Unauthorized Access error is thrown. If the current date is before the closing date of the Assessment, the Assessment is given to the Client.

If the Server can not find the Client's student ID related to any assessment, it throws a No Matching Assessment error.

```
Please input a command: get
Please enter Course Code: CT414
Downloading Assessment.....
Assessment Downloaded!
Please input a command:
```

```
Please input a command: get
Please enter Course Code: CT413
Downloading Assessment.....
Unable to get Assessment!
Error: Assessment is closed
```

```
Please input a command: get
Please enter Course Code: CT567
Downloading Assessment.....
errors.NoMatchingAssessment: Could not find matching assessment
```

# Edit Download Assessment

To Edit the downloaded Assessment, the Client must use the Edit command. The Client will be presented with a menu of options: View, View One, Select, Check and Exit.

```
Please input a command: edit

You are now in edit mode
---- Edit mode Commands ----
View list of all questions and answers options = view
Return one question only with answer options = viewone
To select an answer = select
To view a selected answer = check
To exit edit mode = exit
-----
Please input a command to edit assessment:
```

The Client must have downloaded the Assessment using the Get command previously before trying to Edit the Assessment. This throws an error. This makes the Server leave the Edit mode until the Assessment is downloaded.

```
Exiting edit mode as you have not downloaded an Assignment yet!
```

To Exit the Edit Assessment window, the Client must use the Exit command. This command shows the details of the Assessment that the Client was working on once again. The Client is then returned to the start menu commands where they can then submit their Assessment.

```
Please input a command to edit assessment: exit

Course code: CT414
Closing Date: 2020-02-17
Number of Questions: 3
Finished editing
```

## View assessment questions and options

The View command allows the Client to view all of the questions of the Assessment and all of the answers related to the questions.

```
-----  
Please input a command to edit assessment: view  
  
Course code: CT414  
Closing Date: 2020-02-17  
Number of Questions: 3  
Question 1: Who won the Premier League in 2019  
The Options are: [1. Liverpool, 2. Manchester City, 3. Chelsea]  
Question 2: Who won the Superbowl in 2020  
The Options are: [1. Oakland Raiders, 2. Dallas Cowboys, 3. Kansas City Chiefs]  
Question 3: Who won the NBA Finals in 2019  
The Options are: [1. Miami Heat, 2. Toronto Raptors, 3. Houston Rockets]  
Please input a command to edit assessment:
```

## View one question and options

The View One command allows the Client to select a specific question in which they would like to view and the answers related to this question.

```
Please input a command to edit assessment: viewone  
  
Course code: CT414  
Closing Date: 2020-02-17  
Number of Questions: 3  
  
Please select a question number: 2  
  
Question 2: Who won the Superbowl in 2020  
The Options are: [1. Oakland Raiders, 2. Dallas Cowboys, 3. Kansas City Chiefs]
```

## Select an answer

The Select command allows the Client to select a specific question and view the answers associated with this question. The Client can then choose which answer they believe to be correct.

```
Please input a command to edit assessment: select

Course code: CT414
Closing Date: 2020-02-17
Number of Questions: 3

What question do you want to answer? 3

Question 3: Who won the NBA Finals in 2019
The Options are: [1. Miami Heat, 2. Toronto Raptors, 3. Houston Rockets]
Select an option: 2
```

## Check an answer

The Check command allows the Client to select a specific question and view the answers associated with this question. The Client can then view which answer they chose for the question previously.

```
Please input a command to edit assessment: check

Course code: CT414
Closing Date: 2020-02-17
Number of Questions: 3

What answer do you want to check? 3

Question 3: Who won the NBA Finals in 2019
The Options are: [1. Miami Heat, 2. Toronto Raptors, 3. Houston Rockets]
You Selected option: 2
```

## Submit Assessment

After downloading and editing an assessment the user can submit the assessment to the server to be corrected. Before accepting submission the server checks the session is valid and that the assessment closing date has not passed.

The user can continue editing and submit the assignment as many times as they want , if an existing assessment is found for the student it will be replaced on the server with the newer version. Functionality remains correct when two students are submitting assessments.

Before submission a user must confirm by inputting Y.

If the user attempts to submit an assessment but has not downloaded an assessment yet, they will be given the error below.

```
Please input a command: submit
Are you sure you want to submit your assessment(Y/N)? Y
You have not completed an assessment yet
```

```
Please input a command: submit
Are you sure you want to submit your assessment(Y/N)? N
Please input a command: submit
Are you sure you want to submit your assessment(Y/N)? Y
Assessment Submitted!
```



## Check closing date

When creating an assessment a closing date is specified using a `LocalDate` object. when a user tries to download or submit an assessment, the closing date for the assessment will be checked. This ensures that the closing date is in the future. If the closing date has passed, The user will not be able to download or submit that assignment. A `UnauthorisedAccess` error is thrown and they will be presented with the error shown below.

```
Please input a command: get  
  
Please enter Course Code: CT413  
  
Downloading Assessment.....  
Unable to get Assessment!  
Error: Assessment is closed
```

## Session

when a user logs in initially a session is created. This session object has the `studentID`, authentication token and expiration time. When a session is created the auth token is set using `hashCode` of the student id, the expiry time is set using `LocalTime` library. The expiry time is set to be 30 minutes after the first login. If a user logs in a second time the existing session object will be used however the expiry time will be refreshed.

Each time the client makes a request to the server the server checks that the session is valid. This includes a check to ensure the auth token matches the student id. It also checks that the session has not expired. If the session is not valid an `UnauthorizedAccess` error is thrown and the error is displayed to the client.

```
Please enter Course Code: CT413  
  
Downloading Assessment.....  
Unable to get Assessment!  
Error: Session has expired
```

## Errors

If at any stage the user attempts to use an invalid command they will be presented with an error.

```
Please input a command: avcfy  
  
Invalid Command!
```



## Logout

To logout the user can run the end command. This will close the client process. Any changes to assessments that have not been submitted will be lost.

```
Please input a command: end
```

```
Goodbye
```