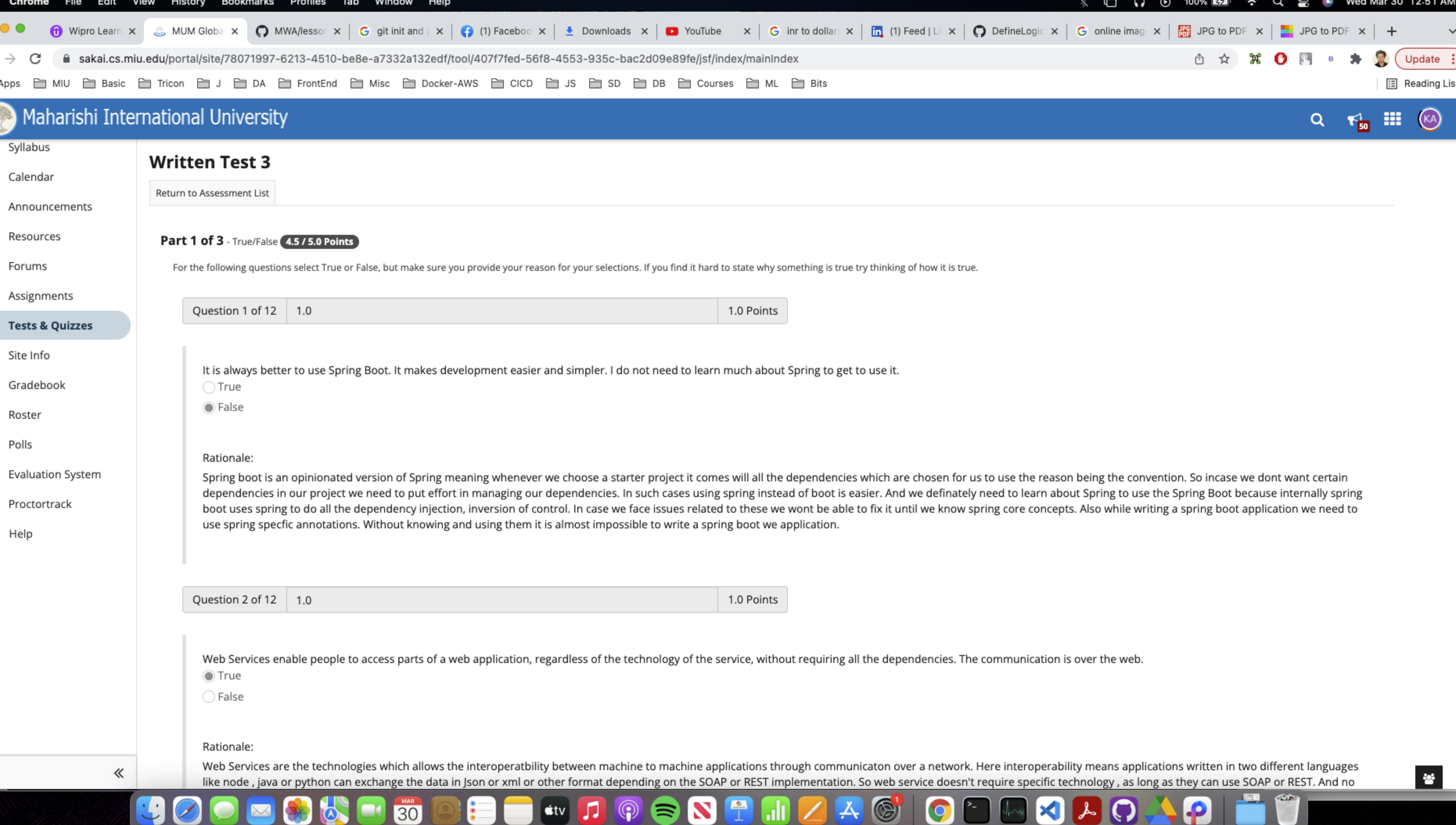


Written Test 3

Return to Assessment List

Part 1 of 3 - True/False **4.5 / 5.0 Points**

For the following questions select True or False, but make sure you provide your reason for your selections. If you find it hard to state why something is true try thinking of how it is true.

Question 1 of 12	1.0	1.0 Points

It is always better to use Spring Boot. It makes development easier and simpler. I do not need to learn much about Spring to get to use it.

○ True

● False

Rationale:

Spring boot is an opinionated version of Spring meaning whenever we choose a starter project it comes will all the dependencies which are chosen for us to use the reason being the convention. So incase we dont want certain dependencies in our project we need to put effort in managing our dependencies. In such cases using spring instead of boot is easier. And we definately need to learn about Spring to use the Spring Boot because internally spring boot uses spring to do all the dependency injection, inversion of control. In case we face issues related to these we wont be able to fix it until we know spring core concepts. Also while writing a spring boot application we need to use spring specfic annotations. Without knowing and using them it is almost impossible to write a spring boot we application.

Question 2 of 12	1.0	1.0 Points

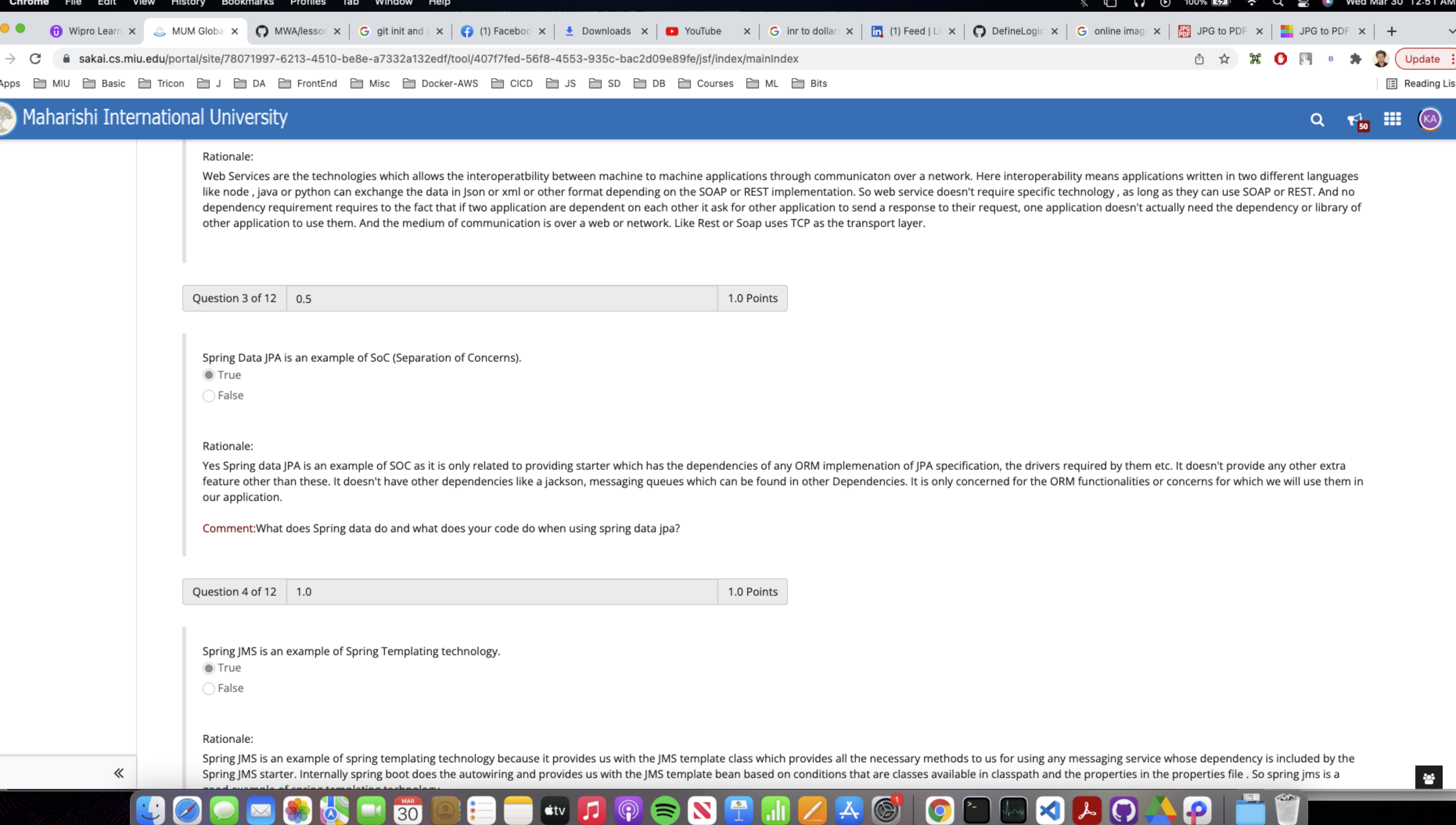
Web Services enable people to access parts of a web application, regardless of the technology of the service, without requiring all the dependencies. The communication is over the web.

● True

○ False

Rationale:

Web Services are the technologies which allows the interoperatbility between machine to machine applications through communicaton over a network. Here interoperability means applications written in two different languages like node , java or python can exchange the data in Json or xml or other format depending on the SOAP or REST implementation. So web service doesn't require specific technology , as long as they can use SOAP or REST. And no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Web Services are the technologies which allows the interoperatbility between machine to machine applications through communicaton over a network. Here interoperability means applications written in two different languages like node , java or python can exchange the data in Json or xml or other format depending on the SOAP or REST implementation. So web service doesn't require specific technology , as long as they can use SOAP or REST. And no dependency requirement requires to the fact that if two application are dependent on each other it ask for other application to send a response to their request, one application doesn't actually need the dependency or library of other application to use them. And the medium of communication is over a web or network. Like Rest or Soap uses TCP as the transport layer.

Question 3 of 12	0.5	1.0 Points

Spring Data JPA is an example of SoC (Separation of Concerns).

● True

○ False

Rationale:

Yes Spring data JPA is an example of SOC as it is only related to providing starter which has the dependencies of any ORM implemenation of JPA specification, the drivers required by them etc. It doesn't provide any other extra feature other than these. It doesn't have other dependencies like a jackson, messaging queues which can be found in other Dependencies. It is only concerned for the ORM functionalities or concerns for which we will use them in our application.

Comment:What does Spring data do and what does your code do when using spring data jpa?

Question 4 of 12	1.0	1.0 Points

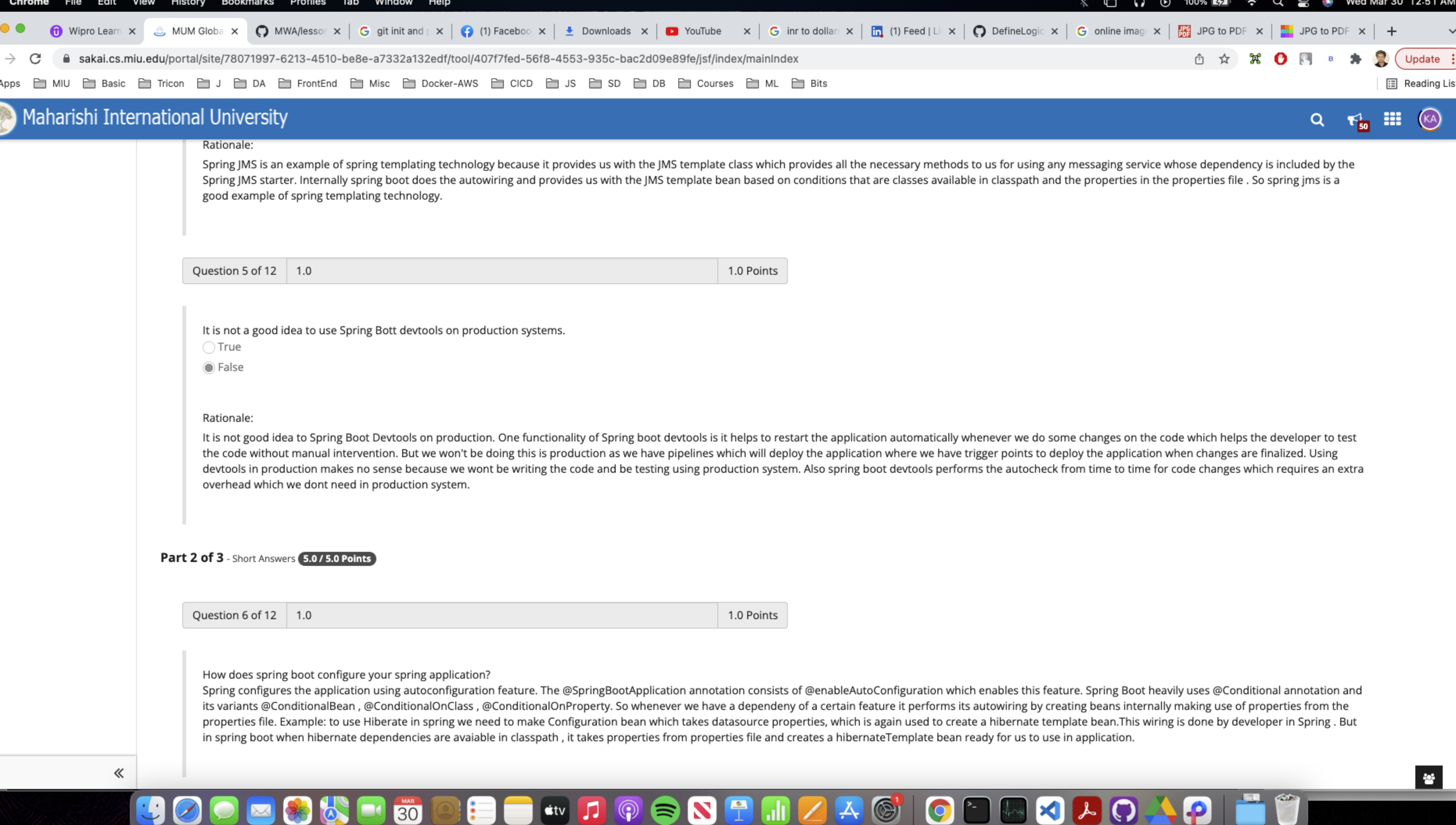
Spring JMS is an example of Spring Templating technology.

● True

○ False

Rationale:

Spring JMS is an example of spring templating technology because it provides us with the JMS template class which provides all the necessary methods to us for using any messaging service whose dependency is included by the Spring JMS starter. Internally spring boot does the autowiring and provides us with the JMS template bean based on conditions that are classes available in classpath and the properties in the properties file . So spring jms is a good example of spring templating technology.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Question 5 of 12	1.0	1.0 Points

It is not a good idea to use Spring Bott devtools on production systems.

○ True

● False

Rationale:

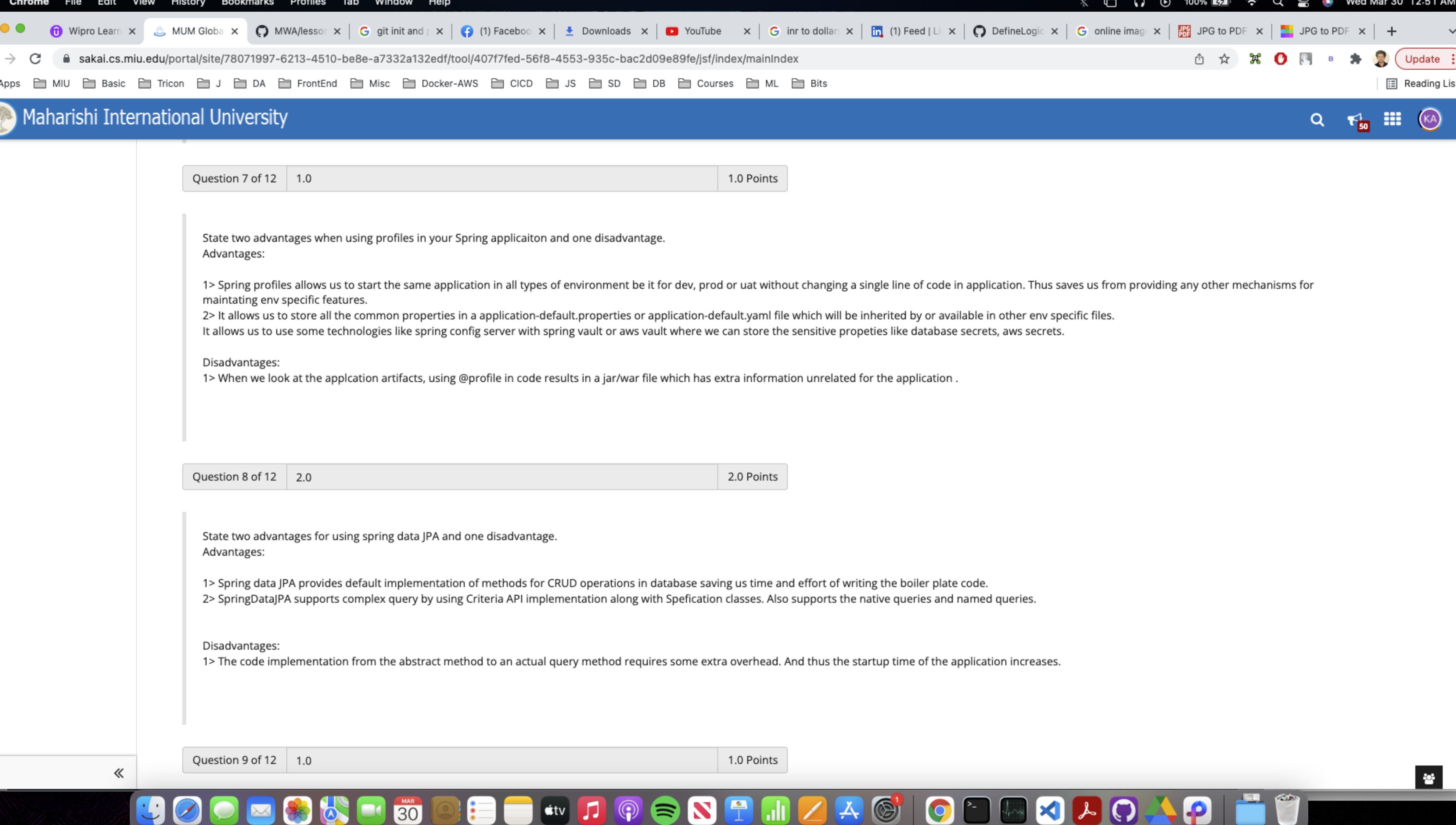
It is not good idea to Spring Boot Devtools on production. One functionality of Spring boot devtools is it helps to restart the application automatically whenever we do some changes on the code which helps the developer to test the code without manual intervention. But we won't be doing this is production as we have pipelines which will deploy the application where we have trigger points to deploy the application when changes are finalized. Using devtools in production makes no sense because we wont be writing the code and be testing using production system. Also spring boot devtools performs the autocheck from time to time for code changes which requires an extra overhead which we dont need in production system.

Part 2 of 3 - Short Answers **5.0 / 5.0 Points**

Question 6 of 12	1.0	1.0 Points

How does spring boot configure your spring application?

Spring configures the application using autoconfiguration feature. The @SpringBootApplication annotation consists of @enableAutoConfiguration which enables this feature. Spring Boot heavily uses @Conditional annotation and its variants @ConditionalBean , @ConditionalOnClass , @ConditionalOnProperty. So whenever we have a dependeny of a certain feature it performs its autowiring by creating beans internally making use of properties from the properties file. Example: to use Hiberate in spring we need to make Configuration bean which takes datasource properties, which is again used to create a hibernate template bean.This wiring is done by developer in Spring . But in spring boot when hibernate dependencies are avaiable in classpath , it takes properties from properties file and creates a hibernateTemplate bean ready for us to use in application.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Question 7 of 12	1.0	1.0 Points

State two advantages when using profiles in your Spring applicaiton and one disadvantage.
Advantages:

1> Spring profiles allows us to start the same application in all types of environment be it for dev, prod or uat without changing a single line of code in application. Thus saves us from providing any other mechanisms for maintating env specific features.
2> It allows us to store all the common properties in a application-default.properties or application-default.yaml file which will be inherited by or available in other env specific files.
It allows us to use some technologies like spring config server with spring vault or aws vault where we can store the sensitive propeties like database secrets, aws secrets.

Disadvantages:
1> When we look at the applcation artifacts, using @profile in code results in a jar/war file which has extra information unrelated for the application .

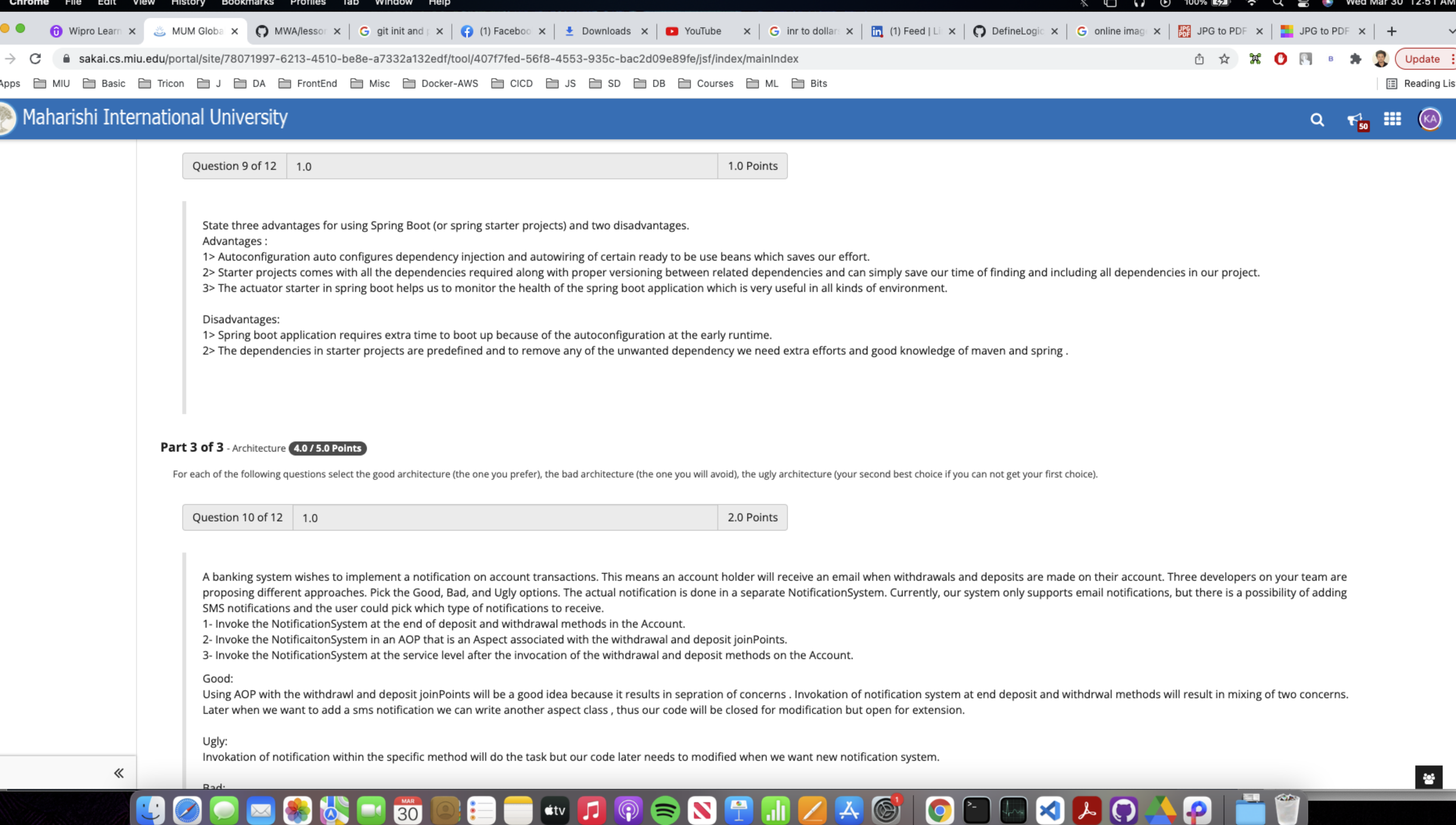
Question 8 of 12	2.0	2.0 Points

State two advantages for using spring data JPA and one disadvantage.
Advantages:

1> Spring data JPA provides default implementation of methods for CRUD operations in database saving us time and effort of writing the boiler plate code.
2> SpringDataJPA supports complex query by using Criteria API implementation along with Spefication classes. Also supports the native queries and named queries.

Disadvantages:
1> The code implementation from the abstract method to an actual query method requires some extra overhead. And thus the startup time of the application increases.

Question 9 of 12	1.0	1.0 Points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Question 9 of 12	1.0	1.0 Points

State three advantages for using Spring Boot (or spring starter projects) and two disadvantages.
Advantages :
1> Autoconfiguration auto configures dependency injection and autowiring of certain ready to be use beans which saves our effort.
2> Starter projects comes with all the dependencies required along with proper versioning between related dependencies and can simply save our time of finding and including all dependencies in our project.
3> The actuator starter in spring boot helps us to monitor the health of the spring boot application which is very useful in all kinds of environment.

Disadvantages:
1> Spring boot application requires extra time to boot up because of the autoconfiguration at the early runtime.
2> The dependencies in starter projects are predefined and to remove any of the unwanted dependency we need extra efforts and good knowledge of maven and spring .

Part 3 of 3 - Architecture **4.0 / 5.0 Points**

For each of the following questions select the good architecture (the one you prefer), the bad architecture (the one you will avoid), the ugly architecture (your second best choice if you can not get your first choice).

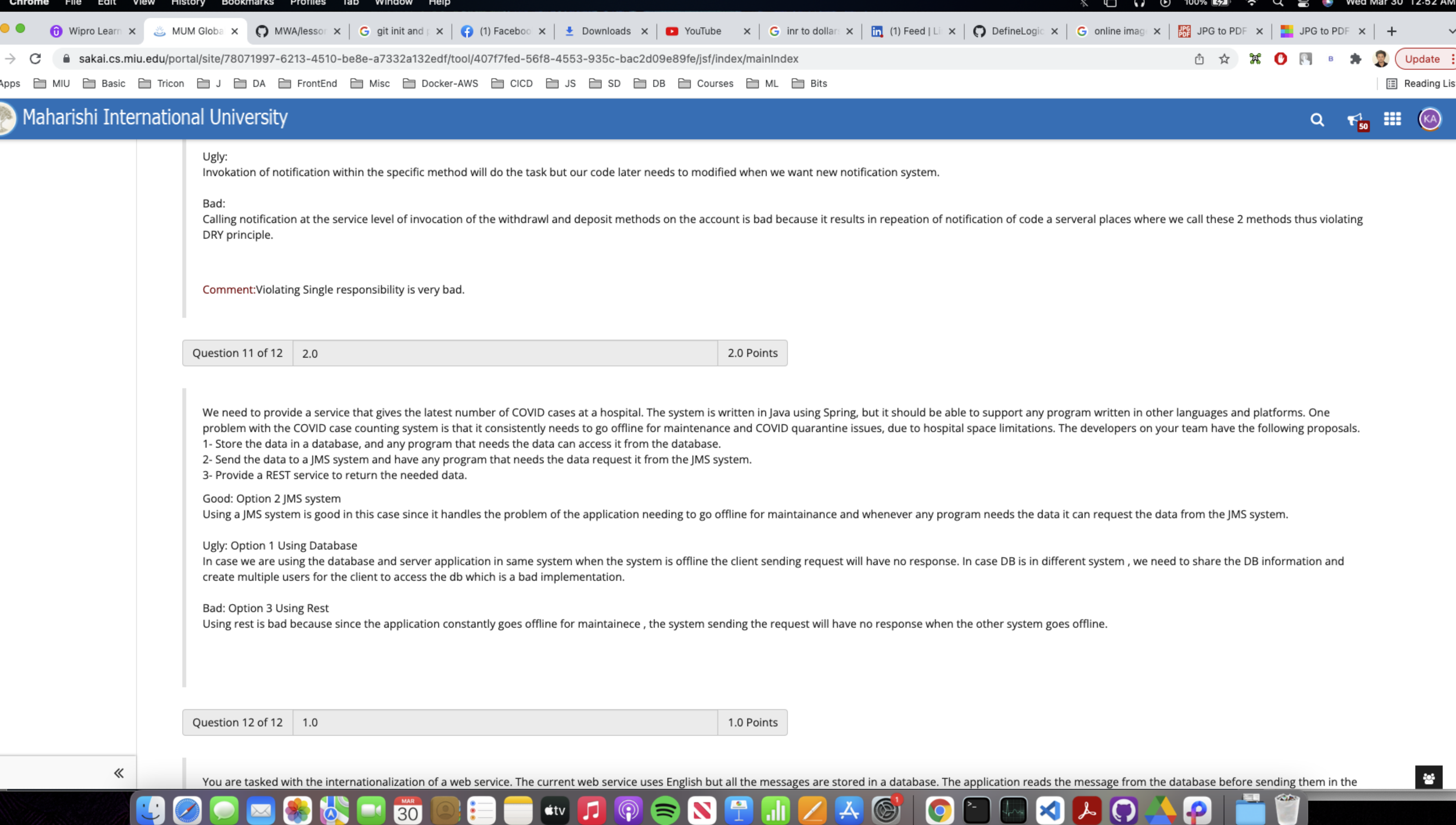
Question 10 of 12	1.0	2.0 Points

A banking system wishes to implement a notification on account transactions. This means an account holder will receive an email when withdrawals and deposits are made on their account. Three developers on your team are proposing different approaches. Pick the Good, Bad, and Ugly options. The actual notification is done in a separate NotificationSystem. Currently, our system only supports email notifications, but there is a possibility of adding SMS notifications and the user could pick which type of notifications to receive.
1- Invoke the NotificationSystem at the end of deposit and withdrawal methods in the Account.
2- Invoke the NotificaitonSystem in an AOP that is an Aspect associated with the withdrawal and deposit joinPoints.
3- Invoke the NotificationSystem at the service level after the invocation of the withdrawal and deposit methods on the Account.

Good:
Using AOP with the withdrawl and deposit joinPoints will be a good idea because it results in sepration of concerns . Invokation of notification system at end deposit and withdrwal methods will result in mixing of two concerns. Later when we want to add a sms notification we can write another aspect class , thus our code will be closed for modification but open for extension.

Ugly:
Invokation of notification within the specific method will do the task but our code later needs to modified when we want new notification system.

Bad: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Ugly:
Invokation of notification within the specific method will do the task but our code later needs to modified when we want new notification system.

Bad:
Calling notification at the service level of invocation of the withdrawl and deposit methods on the account is bad because it results in repeation of notification of code a serveral places where we call these 2 methods thus violating DRY principle.

Comment:Violating Single responsibility is very bad.

Question 11 of 12	2.0	2.0 Points

We need to provide a service that gives the latest number of COVID cases at a hospital. The system is written in Java using Spring, but it should be able to support any program written in other languages and platforms. One problem with the COVID case counting system is that it consistently needs to go offline for maintenance and COVID quarantine issues, due to hospital space limitations. The developers on your team have the following proposals.
1- Store the data in a database, and any program that needs the data can access it from the database.
2- Send the data to a JMS system and have any program that needs the data request it from the JMS system.
3- Provide a REST service to return the needed data.

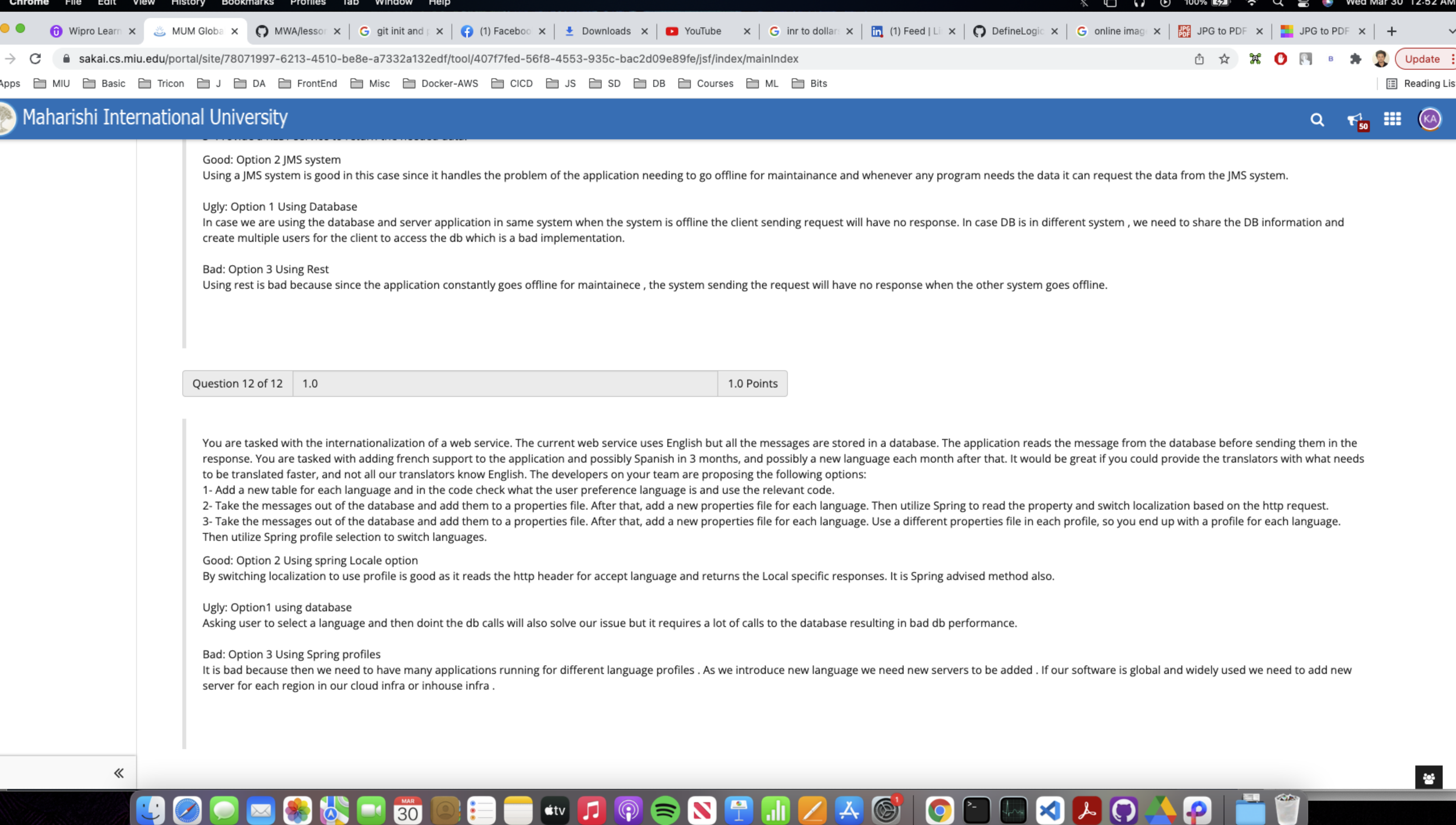
Good: Option 2 JMS system
Using a JMS system is good in this case since it handles the problem of the application needing to go offline for maintainance and whenever any program needs the data it can request the data from the JMS system.

Ugly: Option 1 Using Database
In case we are using the database and server application in same system when the system is offline the client sending request will have no response. In case DB is in different system , we need to share the DB information and create multiple users for the client to access the db which is a bad implementation.

Bad: Option 3 Using Rest
Using rest is bad because since the application constantly goes offline for maintainece , the system sending the request will have no response when the other system goes offline.

Question 12 of 12	1.0	1.0 Points

You are tasked with the internationalization of a web service. The current web service uses English but all the messages are stored in a database. The application reads the message from the database before sending them in the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Question 12 of 12	1.0	1.0 Points

You are tasked with the internationalization of a web service. The current web service uses English but all the messages are stored in a database. The application reads the message from the database before sending them in the response. You are tasked with adding french support to the application and possibly Spanish in 3 months, and possibly a new language each month after that. It would be great if you could provide the translators with what needs to be translated faster, and not all our translators know English. The developers on your team are proposing the following options:
1- Add a new table for each language and in the code check what the user preference language is and use the relevant code.
2- Take the messages out of the database and add them to a properties file. After that, add a new properties file for each language. Then utilize Spring to read the property and switch localization based on the http request.
3- Take the messages out of the database and add them to a properties file. After that, add a new properties file for each language. Use a different properties file in each profile, so you end up with a profile for each language. Then utilize Spring profile selection to switch languages.

Good: Option 2 Using spring Locale option
By switching localization to use profile is good as it reads the http header for accept language and returns the Local specific responses. It is Spring advised method also.

Ugly: Option1 using database
Asking user to select a language and then doint the db calls will also solve our issue but it requires a lot of calls to the database resulting in bad db performance.

Bad: Option 3 Using Spring profiles
It is bad because then we need to have many applications running for different language profiles . As we introduce new language we need new servers to be added . If our software is global and widely used we need to add new server for each region in our cloud infra or inhouse infra .