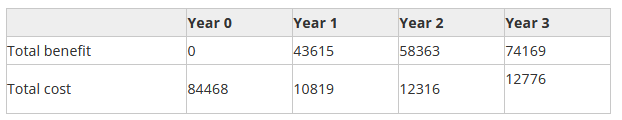
**Assignment 1**

1. Make a comparison between Agile and DevOps.

2. Calculate BEP for the following information. (Check attached file)

3. Walton wants to build a food freshness checking app for refrigerators. Identify functional and non-functional requirements of it.

4. BRACU has a “lost and found” unit in building 2. Now they want to build a Lost and Found app for students. Identify functional and non-functional requirements of it.



**Assignment 2**

The Pentagon is working on a new security protocol to ensure that no one other than no Russian spy can

infiltrate and get access to classified materials. The protocol set is as follows:

1. The user must first enter their password on the password kiosk

2. The password kiosk will send the hash of the password to the basic credentials module (which is a part of the credentials system) and prompt the user to enter their YubiKey

3. The basic credentials module takes the hash and performs the following simultaneously:

a. It matches the hash against known passwords, and if there is a match, then it gets the user uuid, otherwise it generates a false uuid

b. It generates a set of random numbers

4. After the uuid and the random numbers are generated, the basic credentials module concatenates them to create a string and sent back to the password kiosk

5. The password kiosk will then use the YubiKey and the string to generate a hash

6. If the hash is under a specific limit, the user is allowed access, otherwise the user is declined access

Draw the activity diagram

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Ecommerce has been booming in Bangladesh, and especially with the pandemic, the demand for it has exponentially increased. A general case ecommerce runs as follows:

After a customer visits the site, they search for a product by typing its name which is passed to the SearchEngine.

The SearchEngine then fetches the products from the ProductsDatabase and serials them in accordance to the relevance of the searched keywords and returns them to the customer.

The customer selects an item which takes the user to the ProductPage

From the ProductPage, the customer adds the item to their cart which sends a request to the CustomerCart.

After receiving the request, CustomerCart sends a request to the ProductsDatabase to check if the item is in stock, if the item is in

stock, the product gets added to the CustomerCart otherwise an error is shown.

Finally, the customer selects to checkout which sends a request to the CartCheckout where the customer has to enter their full

name, email address, phone number and delivery address.

If all the information has been entered correctly, a success message is shown, otherwise an error message is shown.

Design a Sequence diagram based on the above information.

**Assignment 3**

Let’s assume you are planning an e-commerce startup company called Rent-a-Boi. In this system, the User needs to input his/her user id and password. If the credentials are wrong, the system will show an error message to the user. A user can search for a book. If the book is unavailable, users can request that too. Users can also buy books from this system. Users can make payments to the system and the system will send an acknowledgement to the user. The system can send the requested book list to the Admin. Admin can add new books and update the book database.

Now Design the context diagram of the Rent-a-Boi system.

A user inputs his/her credentials to the login process. Login process verifies the information by checking with the user datastore. When a user searches for a book, check the availability process takes that input and checks the availability by looking at the Book datastore. A user can buy books from the system that is handled by the AB2C (add book to cart) process. The checkout process takes all books from the AB2C process, updates the Book datastore and forward the total price to make payment process. On the other hand, the user provides the payment information to the payment process too and it sends an acknowledgment to the user. When a user requests a new book, the request book process forwards the requested book information to the Admin. Admin can add new books to the Book datastore or update the datastore with the new collection.

Now Design the Level-1 diagram of the Rent-a-Boi system.

\*\*Make necessary assumptions where needed.

**Assignment 4**

BRACU-Crawler is a pilot project designed to crawl BD sites only. First, the Initiate crawler module provides current status of URL queue to the Schedule policy module and receives policy map and crawling threshold number. Until a threshold reached flag is received from the Fetch URL module, Crawler receives a link from Fetch URL module. It then retrieves a new page by providing page link to the Fetch site page module. This page is then sent to the Extract URL module and it returns a set of newly extracted links to the Crawler. In order to do that, Extract URL module first generates raw links using Parse raw links module and sends those to the Filter Valid links module. Filter valid links module returns only the URLs that Crawler should crawl in the future. After receiving the filtered links, Extract URL module formats the links using a library module called Format link and finally sends these filtered-formatted links to the Crawler. Based on the policy map, Crawler can either add the links to the Update URL queue module which is an off-page connector or dispatch to the Reschedule policy module which is an on-page connector.

Design a structure chart from the above scenario.

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Bangladesh Cricket Board (BCB) has decided to to monitor cricketers. They have hired you and given you the following instruction.

1. Only the board official will be allowed to access this mobile app.

2. After logging in officials should be able to access a list of all players currently in a contract with BCB.

3. If they click on a name, it should redirect them to a page. The page should contain statistical information regarding that player. For

example, if they click on Shakib Al Hasan, your app should display Shakib-Al-Hasan’s stat.

4. Officials should be able to find a list of top 10 batsman by clicking a button

5. Officials should be able to find a list of top 10 bowler by clicking a button

6. Officials should be able to find a list of top 10 fielder by clicking a button

7. Official should be able to find the best playing eleven by clicking a button

8. Officials should also be able to see the upcoming series of Bangladesh Cricket Team as well What you have to keep in mind is that all the pages created for this application should be interlinked to the player's info page.

Design a WIndows navigation diagram (WND) from the above scenario.