**Task 2: System modeling (Upload description paragraphs here)**

**2.1. Activity Diagram**

**Uploading document:**

Student Actions:

1. Log in: The process begins with the student logging into the system.
2. Select Document: After logging in, the student selects the option to upload a document.
3. Choose File: The student selects a file from the system to upload.

System Actions:

1. Upload Chosen File: Once the student selects the file, the system processes the upload of the chosen file.
2. Store Operation: After the file is successfully uploaded, the system logs the file upload operation for recording.

End of Process: The diagram concludes with the successful completion of the file upload and logging process.

**Printing document:**

Student Swimlane:

1. Log in: The process begins with the student logging into the system.
2. Select Printer: The student selects a printer from the list of available options.
3. Choose File: The student chooses the document they want to print from their uploaded files.
4. Specify Printing Properties: The student specifies the printing properties such as color, number of copies, etc.

System Swimlane:

1. Check Balance: The system checks if the student has sufficient page balance to proceed with printing.
   * If the student's balance is insufficient (balance < required amount), the system goes to the next step.
   * If the balance is sufficient (balance >= required amount), the system moves forward with the request.
2. Display Notification (Insufficient Balance): If the balance is insufficient, the system shows a notification informing the student that they need more balance.
3. Send Print Request to Printer: If the balance is sufficient, the system sends the printing request to the selected printer along with the document and printing details.
4. Confirm Print Success: After sending the request, the system confirms the success of the print operation.
5. Record Details in Log: The system logs the details of the print request for future reference.

Printer Swimlane:

1. Process Print Request: The printer processes the received print request and initiates the printing process.

End of Process:

The diagram concludes when the print request is processed successfully and logged.

**2.2. Sequence Diagram**

1. **Print Document**

**Initial state:** user logged in as "Student"

**Activities/Sequences**

1. system shows list of printers

2. user selects a printer SelectPrinter(printerID)

1. Check printer condition

1. The printer is currently online

1. Initiate the GUI for file uploading and setting printing properties

2. Continues to 3.

2. The printer is unavailable

1. User is notified about the problem Error("Printer Unavailable!")

2. Return to 1.

3. user choose to upload a file UploadFile(FileName)

1. A window pop up for the user to choose a file

2. The system check the file extension

1. Status File extension is valid. File upload shows status "ok" FileStatus("OK")

1. Process can still continue to 4.

2. ? File extension is valid. File upload shows status "Invalid file extension, valid ones are .docx, .doc, or .pdf" FileStatus("Invalid"); ShowMessage("Invalid file extension, valid ones are .docx, .doc, or .pdf")

1. Process can still continue to 4.

3. File sent to server

4. user specify the printing properties SetProperties(paperSize, numCopy, isColor)

1. Check if printer can print with color

1. Yes. Continues to 5.

2. No.

1. Notify users. ShowMessage("Warning! This printer does not support color printing!")

2. Continues to 5.

5. user hit button "Print document" UserRequestPrint(filename, paperSize, numCopy, isColor)

6. Check file condition

1. Status\_file is invalid.

1. Reject print request Error("Invalid file extension!");

RejectPrint()

2. Go back to 3.

2. Status\_file is valid. Proceed to 7.

7. Calculate the required number of page

8. Check balance

1. Insufficient balance. Reject print request Error("Insufficient page balance!"); RejectPrint()

2. Sufficient balance.

1. Notify users of successful print requests. ShowMessage("Print request sent! Printing is underway! .

2. Continue to 9.

9. Send print request to printer SystemRequestPrint(file, paperSize, numCopy, isColor)

10. Return the status from the printer

1. Notification Print successful. Notify the user ShowMessage("Document printed successfully! Come pick up your document!

2. Notification Print failed. Notify the user ShowMessage("Unexpected error occurred at printer! Print failed!")

1. **Record print request**

**Initial state:** A printer just finished handling a print request

**Activities/Sequences:**

1. Printer request to record to the system database RequestToRecord(printerID)

2. The system put the request into a waiting queue

3. System get a waiting request from the queue to handle it

4. System handle the request

1. Accept.

1. System register a row for the request Accept(printerID)

2. System requests the printer to send the record. WaitingForData(printerID)

3. Proceed to 4.

5. The printer sends the printing record to the system RecordPrint(printerID, filename, pageSize, NumCopy)