

Meaad Hassan

**CIS 425 – Midterm Exam – Dr. Medjahed
Fall 2023**

Due: Tuesday October 10th, 2023 by 11:59pm

Late submissions are subject to late policy (see syllabus) – NO exception

READ THIS NOW!

IMPORTANT

- The exam is not timed but answers need to be uploaded on Canvas as **one single PDF** file by the deadline.
- Ready the following important statement.

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On Honor:

- I have neither given nor received aid on this examination.
- I did not discuss any of the exam questions (partially or fully) with anyone.
- I did not share any of the answers (partially or fully with anyone).

Statement on Academic Conduct: The University of Michigan - Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the university's standards of academic conduct as set forth by the Code of Academic Conduct, as well as policies established by the schools and colleges. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses. Violations will not be tolerated and may result in penalties up to and including expulsion from the University.

Initials: _____ M.H _____

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Problem 0 – 5 points

Copy and paste the paragraphs from the previous page delimited by "---Cut here--- ". Make sure you insert your initials as indicated.

This acknowledges your understanding of the University's Statement on Academic Conduct.

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Problem 1 – 15 points

Design an interview with 6 questions for a case study of your choice. The case study has to be different from all cases studies covered in class.

You are required to provide the following:

1. Explain the case study you selected in no more than 100 words. **(2 points)**
2. Describe the goal of the interview in no more than 50 words. **(2 points)**
3. Provide the 6 questions and indicate whether they are open or closed. **(9 points)**
4. Structure the interview either as pyramid, funnel, or diamond. Explain what structure you adopted and why. **(2 points)**

The case study chosen was for an e-commerce inventory system. This boutique company, Sucreys, sells clothing online exclusively for car lovers in categories like T-shirts, Hoodies, Hats, and socks. Each category has multiple sizes and designs to suit the preferences of its customers. The current system is inefficient workflow, causing misplaced items and wrong items shipped or out of stock. They want a system that can track every piece of an item they have in inventory and can update as the item is sold and locate them in the big warehouse where they stock the items. The interviewee is the manager of the facility.

My goal is to get as much information from the manager to help me understand how the current system works. Also, to understand their need for the new system and how it should improve their workflow while creating better customer service.

What are the significant problems with the current inventory system? (Open)

What specific features are lacking in the current inventory system that the employees wish to have? (Open)

How are the orders recorded in the system and fulfilled? (Open)

What is the current method for reordering with the current system? (Closed)

How are items tracked with the current inventory system? (Closed)

How often do you physically inventory all items with the system? (Closed)

Funnel- Trying to give my interviewee space to tell me in detail and not feel pressured to answer it in a certain way. It allows for the interview to be flexible and maybe adapt to the questions depending on how they answered their question. I can get a detailed insight into their current system and what improvements are required to satisfy my clients' and ask them follow-up questions for a more in-depth explanation.

Problem 2 – 25 points

The goal of this problem is a design a system Called "Student Orgs Portal" to manage student orgs/clubs in a university. The system is part of the office of student life. Any student in the college can login to the system by providing their university username and password. The following are the external entities of the system:

- Org Leadership Representative
- Student
- Dean of Students Office
- Faculty Advisor

At anytime, a representative of the org leadership may submit a New Student Org Form. The form includes the name of the org, the first name, last name, phone number, and student ID of the president, and leadership composition of the org. The leadership composition includes the first name, last name, student ID, and role (e.g., secretary, vice president, etc.) of the leadership member. The new student org creation also requires the submission of the bylaws document of the org as well as the first name, last name, and email of the Org's faculty advisor. The request is processed by the office of student life for approval (see next paragraph). The student is notified whether the request is approved or not. All new student org requests are saved in the "Student Orgs Master".

As part of the new student org approval process, the office of student life checks the new student org form for consistency and completeness. Then, it reviews the bylaws document submitted as part of the request. As a result, the office of student life may send comments to the student. The student resubmits the revised bylaws to the system. The office of student life then sends an approval request to the Dean of Students' Office. If approved by the Dean of Students Office, the next step is to send an approval request to the faculty advisor. As a result (approved or not), the "Student Orgs Master" is updated.

Org leadership members of an existing Org can login to the system at any time to share events organized by their orgs. Event information includes event name, date, time, location, and short event description. Any student in the university can access the system to search for events of interest by providing the list of Orgs they are interested in as well as from/to dates.

Org leadership members of an existing Org can also login to the system at any time to update the list of members of their org:

- 1) Give the context level diagram for the "Student Orgs Portal" **(10 points)**.

2) Give Diagram 0 (10 points).

IMPORTANT: in your diagram 0, you are required to have a process named "Approve New Org" that includes all tasks summarized in the underlined paragraph (see previous page).

Please note that other processes need also to be included in Diagram 0.

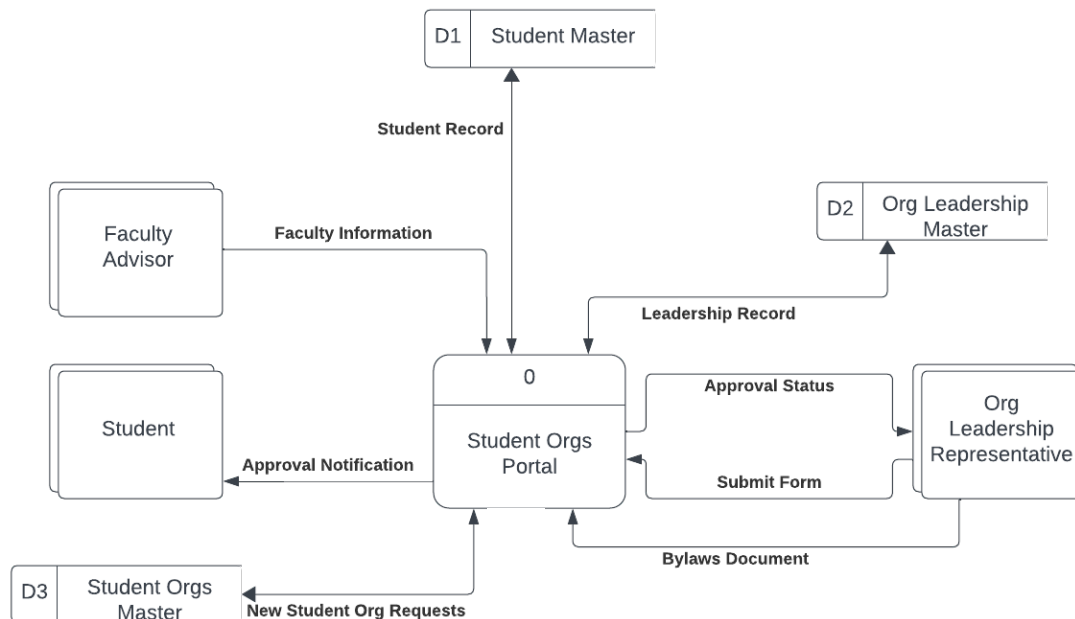
3) Give the child diagram of the process "Approve New Org" mentioned in the previous question. (5 points)

IMPORTANT: All processes included in this child diagram should be primitive.

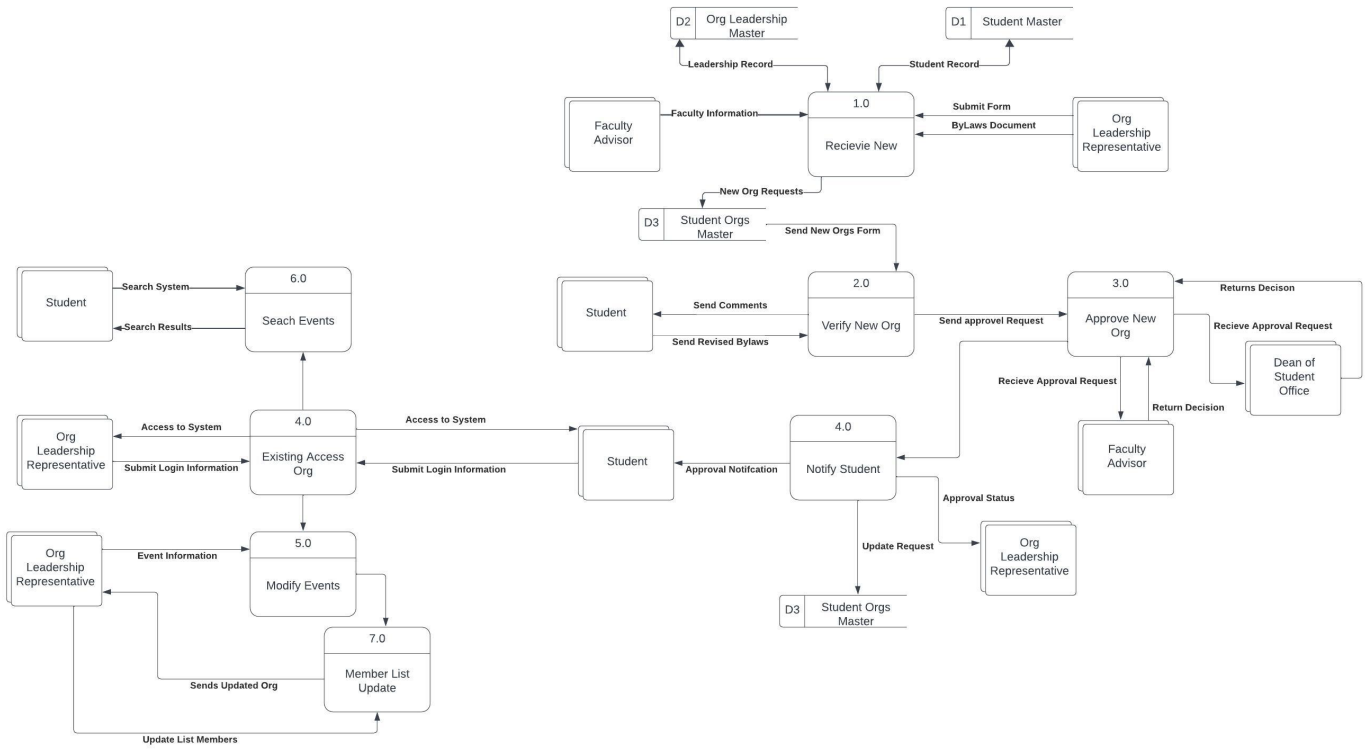
Note:

If you use a complex data as data flow, then you need to provide a description of the complex data as a side note (e.g., after the DFD that includes the data flow with the complex data). For instance, if you have a data flow named "Org's faculty advisor information" then you need to add a note (after the DFD) stating that "Org's faculty advisor information" is composed of first name, last name, and email

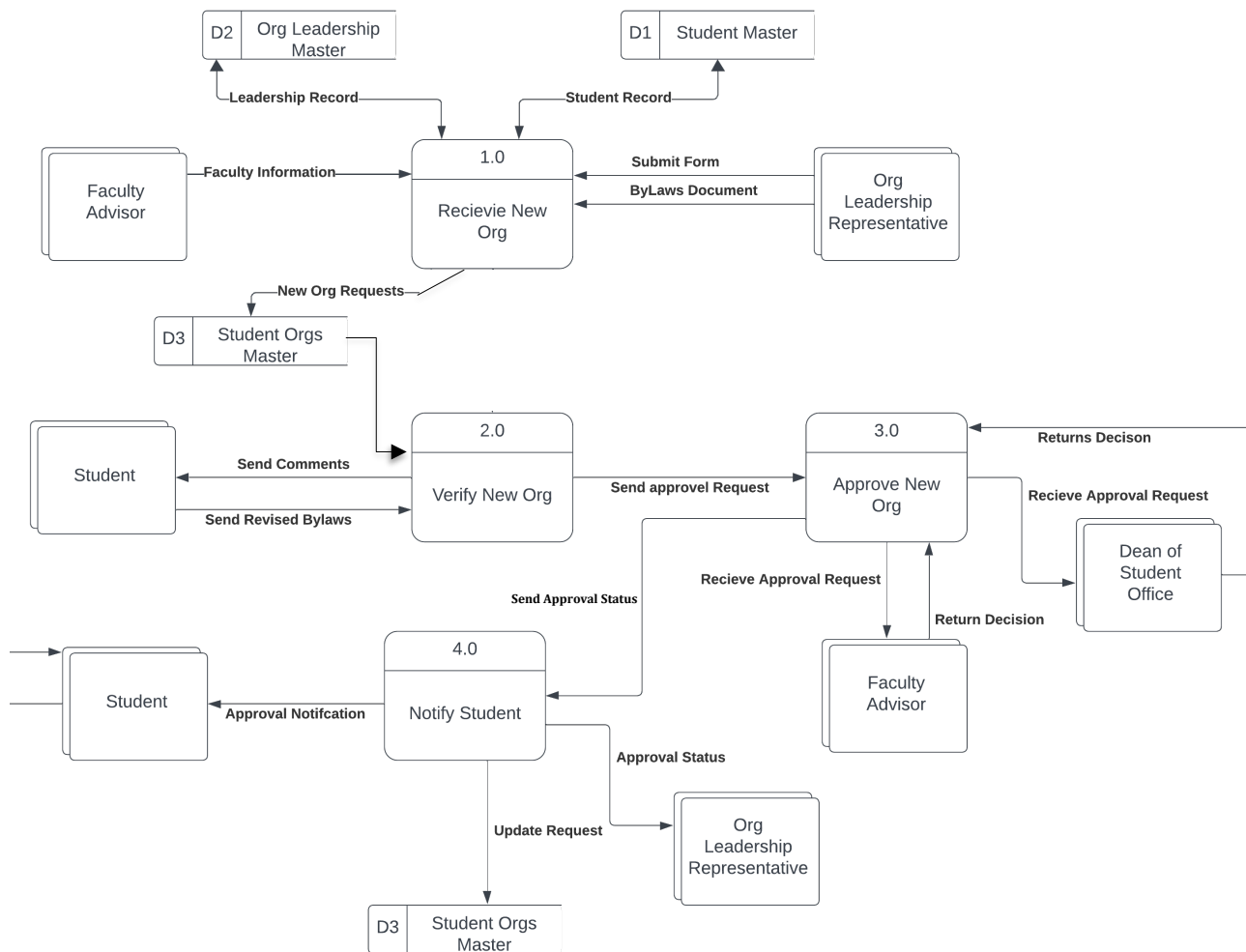
Context Level Diagram

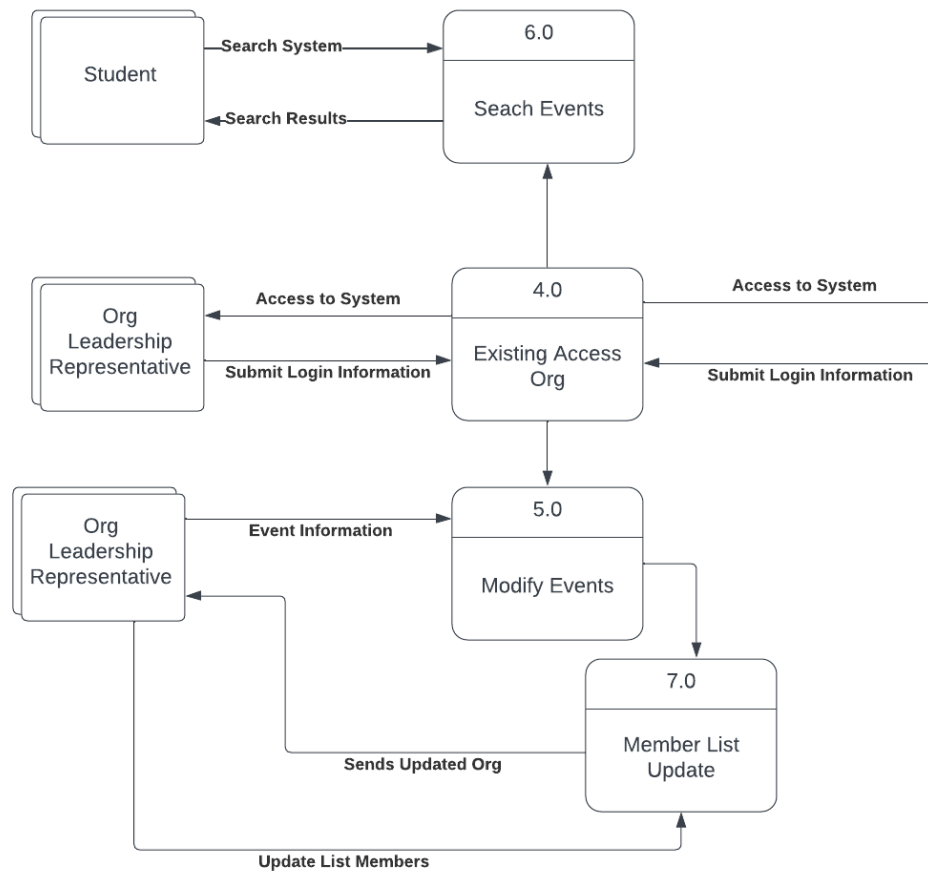


Level 0 Diagram

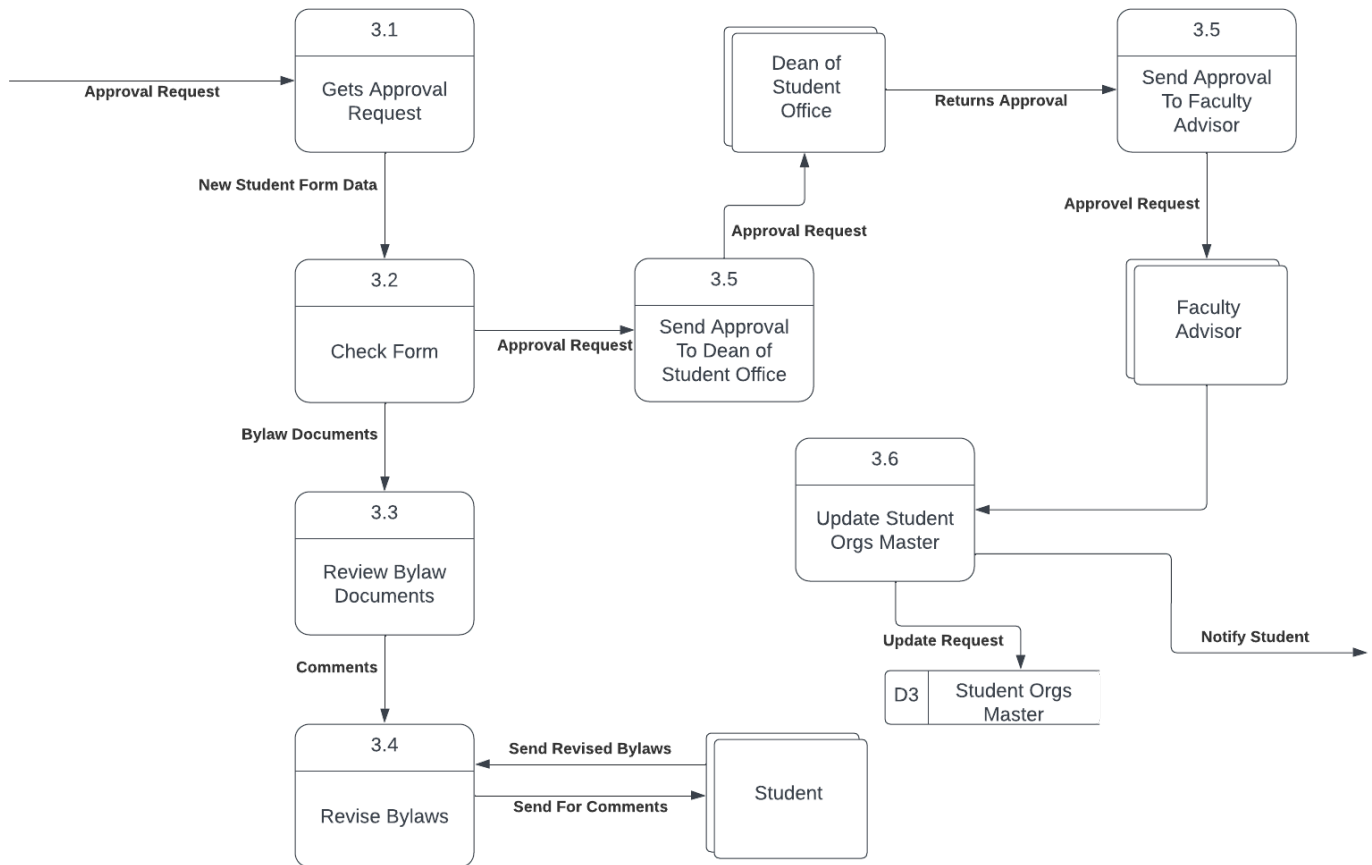


Detailed Diagram 0





Child Diagram Process 3 “Approve New Form”

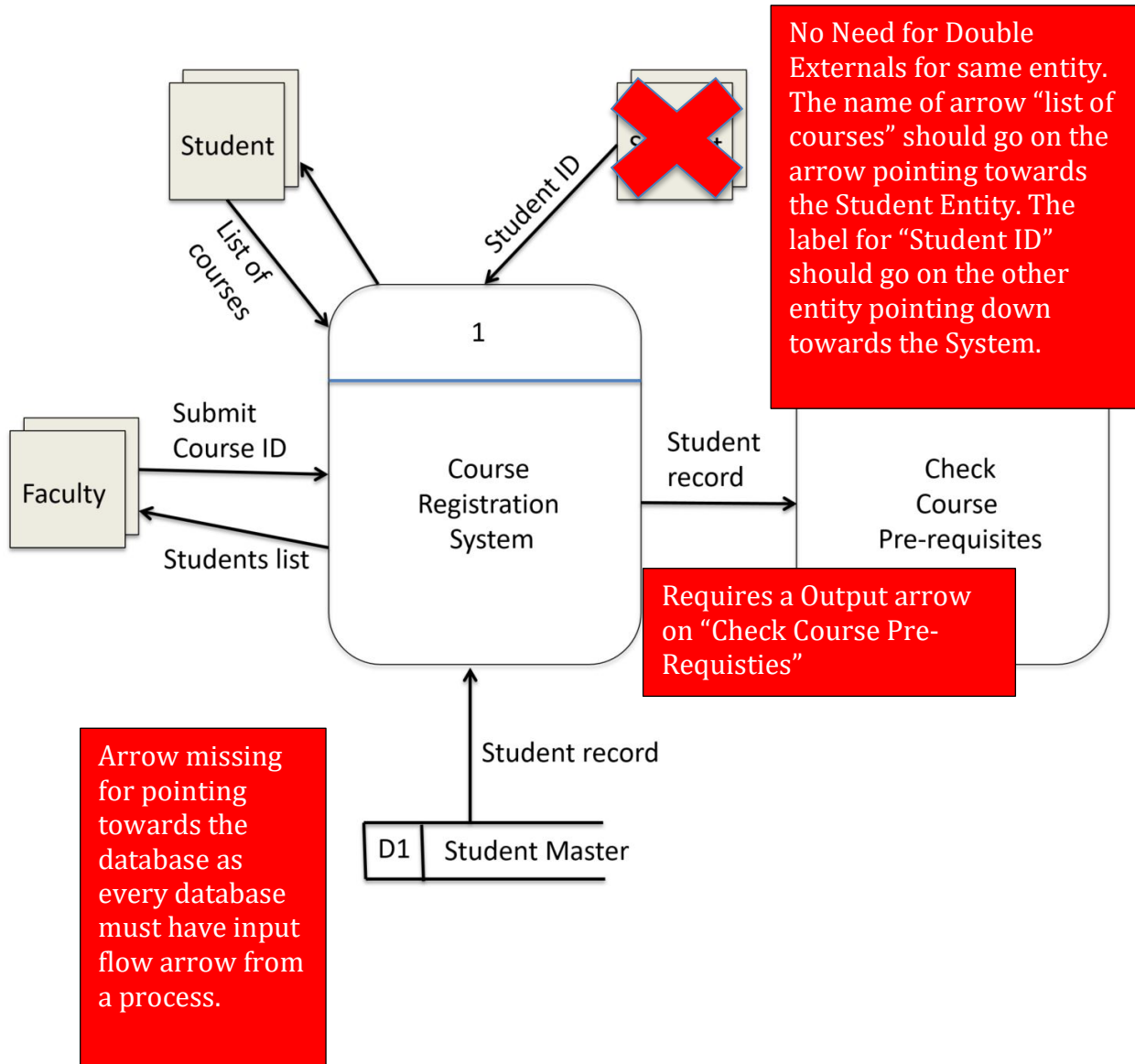


Problem 3 – 15 points

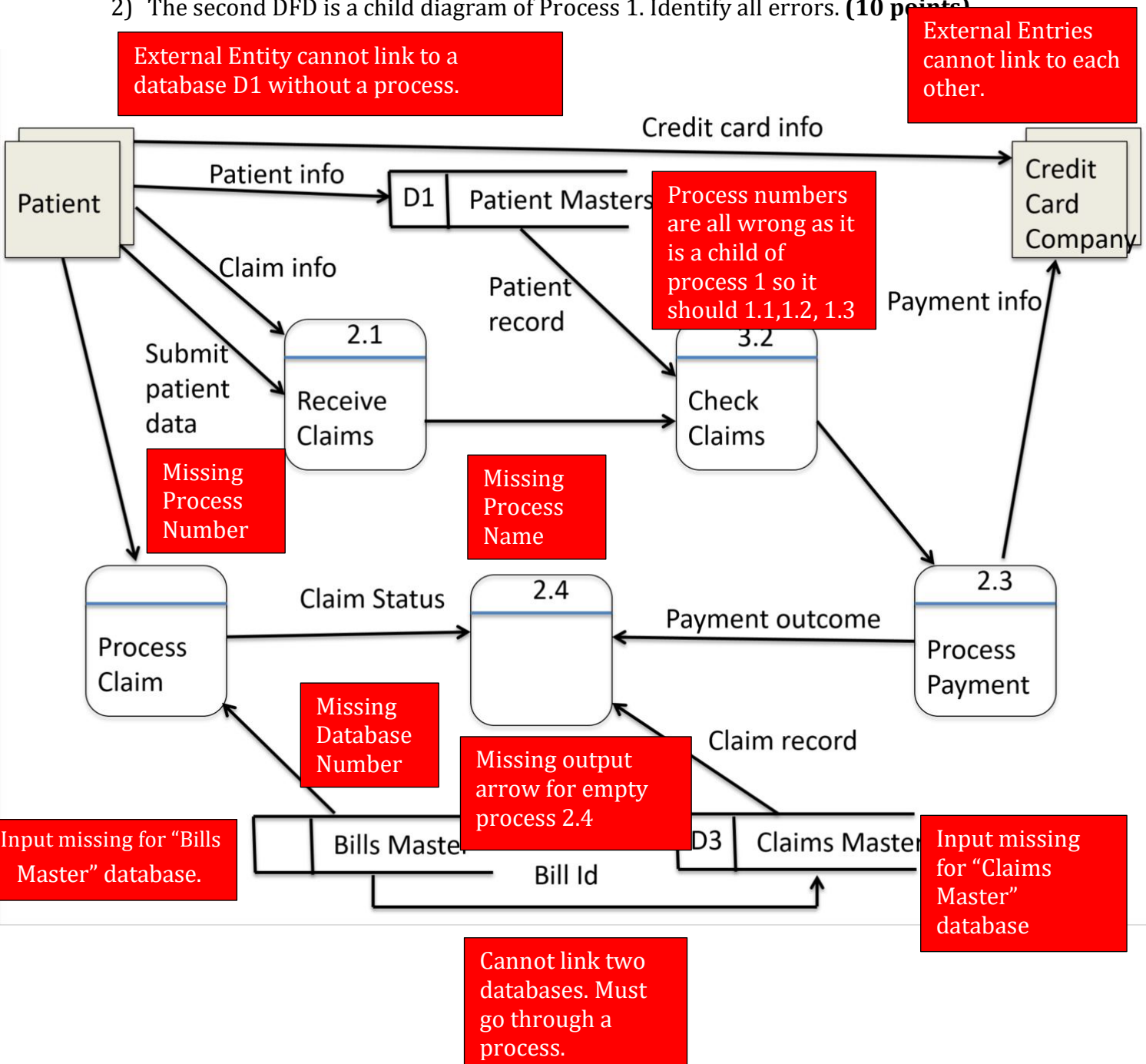
In the following two questions, please identify all errors in each DFD.

You are required to copy and paste each diagram and annotate it with all DFD errors.

- 1) The first DFD is a context level DFD for a course registration system. Identify all errors. **(5 points)**



2) The second DFD is a child diagram of Process 1. Identify all errors. (10 points)



Problem 4 – 10 points

Give a decision table (not the entire process specification form) for the following decision-making process used by XYZ University to decide whether a student is eligible to apply for an “ABC Scholarship”.

To be eligible for the scholarships students should have a 3.5 or higher GPA. The scholarship is open only to rising juniors or rising seniors. Rising seniors are eligible only if they completed or secured at least one internship before the application deadline. Rising juniors are eligible only if they are members of a professional society’s chapter in the college. Students that were awarded the ABC scholarship before are not eligible to apply.

Condition	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
GPA >= 3.5	Y	Y	Y	N	N	N	Y	Y	Y	N	N	N
Junior Class	Y	Y	Y	Y	Y	Y	-	-	-	-	-	-
Senior Class	-	-	-	-	-	-	Y	Y	Y	Y	Y	Y
Member of a Professional Society	Y	N	Y	N	Y	Y	-	-	-	-	-	-
Secured an Internship	-	-	-	-	-	-	Y	N	Y	N	Y	Y
Previously Awarded	N	N	Y	N	N	Y	N	N	Y	N	N	Y
Action												
Eligible	X						X					
Not Eligible		X	X	X	X	X		X	X	X	X	X

Problem 5 – 15 points

Identify all errors in the following decision table (see next page). You are required to identify errors related only to the following error types:

- 1) Impossible Situations.
- 2) Contradictions.
- 3) Redundancies.

List all possible errors. For each error, you are required to provide the following information:

- The two rules (R1, ..., R7) from the table that cause the error.
- The type of error (impossible situation, contradiction, or redundancy)
- Brief explanation of the error.

R1- impossible situation

It has a condition of $X > 10$, and X is between 5 and 10, which cannot happen as both conditions cannot be met.

R2,R3,R7- Contradiction

R2, R3, and R7 are similar rules, but R3 contradicts as it has no marks for the conditions, while R7 has some marks on those conditions. R2 also contradicts R3 as condition 1 is Y for R2 while R3 has a hyphen, which means either Y or N. So, it is impossible to have a rule stating a condition is met, and another rule contradicting it as it does not matter and has the same actions.

R5,R6- Contradiction

As their rules and condition are equal met and once you get to the conditions one has it does matter while other has a definite N. While also have different actions which contribute to confusion on which one is the correct rule based on the condition it met.

Conditions	R 1	R 2	R 3	R 4	R 5	R 6	R 7
$X > 10$	Y	Y	Y	N	N	N	Y
$10 \geq X \geq 5$	Y	N	N	N	Y	Y	N
$X < 5$	N	N	N	Y	N	N	N
Condition 1	N	Y	-	Y	-	-	-
Condition 2	-	-	-	-	Y	Y	N
Condition 3	-	-	-	-	-	N	Y
Actions							
Action 1		X			X	X	
Action 2	X	X	X				X
Action 3	X	X	X		X		X
Action 4				X			

Problem 6 – 15 points

Your team is tasked to revamp the Web site of a department store. The department store already has a current Web site. The company would like to make the functionalities that are already available in the current Web site more user-friendly and more accessible to users. They also would like to add few features that do not exist in the current Web site (e.g., chatbot, etc.)

After few months leading your team throughout the early stages of the design and implementation of the new web site, your team is now meeting to plan for a conversion strategy to move from the current to the new Web site.

Discuss each of the following strategies:

- 1) Direct Changeover.
- 2) Parallel conversion.
- 3) Modular prototype conversion.

For each strategy, discuss the following (no more than 150 words for each strategy):

- 1) How will the strategy work for the Web site conversion? You need to consider both existing and newly added functionalities.
- 2) Cite one single advantage of using the strategy.
- 3) Cite one single risk and give a solution on how to mitigate that risk.

You are required to select the best strategy (one of the three listed above) and explain your choice in no more than 150 words.

Direct Changeover- The strategy works as it is not a vital website where the department store will see significant problems. The new website has everything the old site has, with a user-friendly design and new features, so it would work to change immediately to the new one. The one advantage is the quick transition, allowing for a straight change on a specific date and minimizing the cost of running two websites simultaneously. The disadvantage is that unexpected problems occur while using the new website. It can be mitigated as best as possible by rigorously testing the site functions before the site's launch goes public.

Parallel Conversion- It will be quite challenging to run both sites simultaneously as people are reluctant to change and continue using the old site as long as possible. You would need a redirect link to the new site on the old site, and as time progresses, force the link to the new site and have a redirect to the old site until one day, the redirect disappears. An advantage is that it allows people to learn the new changes, give great feedback to the developers, and go back to the old site. A significant disadvantage is the prolonged transition of switching, causing people to be confused and costing the company a great deal of resources. A way to mitigate it is to shorten the overlay of both systems running to a minimal as it allows for user to understand the new site while not costing as much.

Modular Prototype Conversion- It allows for complex design of website where it can allow for certain features to be enabled at a time and receive feedback. You can develop the site and push the new features as you go and slowly have all the new features and completely wipe out the old site in a matter of years.

Its advantage that the developers can polish a module based on user feedback before it fully integrated allowing for risk to be mitigated as that module can be taken out if it breaks. A disadvantage is the time consuming the project becomes as you slowly develop each module and cost the most out of all three in resources. It can be fixed with shortened span for time it takes a module to be developed and integrated allowing the resources to be freer.

Direct changeover is the best method to use to change to the new site as it allows for immediate usage as the domain can only be linked to one site. You can remind your customers of this change with a reminder on the top of the old site. It minimizes the time of both systems coexisting which in hindsight allows it to be a cost-effective method. The other options require both the old and new to be both existing, which is difficult to maintain and costly as more server space is going to be required. Since this can be replaced without causing significant disruption to a company, a slow exchange will confuse customers and make it difficult to coordinate the changeover, unlike a set date with direct changeover.