

Exercises

1. Use a DFD diagramming to draw DFD's for the following:
Admission procedure in a University. An advertisement is issued giving essential qualifications for the course, the last date for receipt of application, and the fee to be enclosed with the application. A clerk in the Registrar's office checks the received applications to see if marksheet and fee are enclosed and sends valid applications to the concerned academic department. The department checks the application in detail and decides the applicants to be admitted, those to be put in the waiting list, and those rejected. Appropriate letters are sent to the Registrar's office which intimates the applicant. Give physical and logical DFDs corresponding to the above problem.
2. Use a DFD diagramming to draw DFD's for the following:
A magazine is published monthly and is sent by post to its subscribers. Two months before the expiry of subscription, a reminder is sent to the subscribers. If subscription is not received within a month, another reminder is sent. If renewal subscription is not received up to two weeks before the expiry of the subscription, the subscriber's name is removed from the mailing list and the subscriber informed. Obtain logical DFDs for this problem.
3. Use a CASE tool to format and check structured English processing rules for the following:
An organization maintains an employee file in which each record has following data:
{ Employee No., employee name, employee gross pay }.
It has been decided to increase the pay as per the following formula:
For pay of Rs. 1000 or less increase 15%.
For pay of more than Rs. 1000 but up to Rs. 2500 increase 10%.
For pay over Rs. 2500 increase 5%.
 - (i) While employee records left in file do
Read Number, name , gross pay
if gross pay <=1000
then increase = gross pay. 0.15
else if gross pay <= 2500
then increase = gross pay. 0.1
else increase = gross pay. .05
end if
end if
Gross pay = gross pay + increase
Write Number, name, gross pay
end while
 - (ii) While employee records left in file do
Read Number, name, gross pay
do Table

Gross pay <= 1000	Y	N	N	
Gross pay <= 2500	-		YN	
Percent increase	15	10	5	

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end table
Gross pay = gross pay.(1+percent increase/100)
Write Number, name, gross pay
end while
    
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- Use a structured English process description tool to obtain Structured English description for the following:

An offshore gas company bills its customers according to the following rate schedule:

First 500 litres Rs. 10 (flat)
 Next 300 litres Rs. 1.25 per 100 litres
 Next 30,000 litres Rs. 1.20 per 100 litres
 Next 100,000 litres Rs. 1.10 per 100 litres
 Above this Re. 1.00 per 100 litres

The input record has customer identification, name and address, meter reading, past and present.

- Obtain system flow chart using appropriate tools for Exercises 3 and 4 above.
- Use Decision Table checking tool to check the following Decision table.

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15	R16
C1: Door open?			N	N	N	N	N	N	N	Y	Y	Y	Y	Y	Y
C2: Ring sign on?			N	N	N	Y	Y	Y	Y	N	N	N	N	Y	Y
C3: Enter sign on?			N	N	Y	Y	N	N	Y	Y	N	N	Y	N	Y
C4: Door locked?			N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	Y

Ring bell	-	-	-	-	X	-	X	-	-	?	-	?	X	?	X	?
Enter-	-	-	-	-	X	-	-	-	?	X	?	-	?	X	?	
Wait-	-	-	X	-	-	-	-	-	?	-	?	X	?	-	?	
LeaveX	X	-	X	-	X	-	X	X	?	-	?	-	?	-	?	
A1	A1	A2	A1	A3	A1	A4	A1	A1	A2	A3	A4					

- Use Decision Table checking tool for the following Decision table

C1: This week's cash > weekly rate	-	Y	-	Y	N	Y	N	-	N	-	-	-	-	-	-
C2: This week's cash > 0	-	-	Y	-	Y	-	Y	N	-	N	N	-	-	-	-
C3: Any cash during last month	Y	-	N	N	Y	Y	Y	N	N	-	Y	-	-	-	-
C4: Arrears . > 2 * weekly rate	N	-	-	-	-	-	Y	-	-	Y	Y	-	-	-	-
C5: Arrears > 4 * weekly rate	-	N	N	-	Y	Y	N	N	Y	Y	N	-	-	-	-
Send arrears letter A	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-
Send arrears letter B	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Send arrears letter C	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-
Send arrears letter D	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X
Notify accounts	X	X	X	X	X	-	-	-	-	-	-	-	-	-	-
Take special action	-	-	-	-	-	-	-	-	-	-	-	-	X	X	-

- Use ER-Diagramming tool to solve the following
 - Customer withdraws money from his account.
 - Students write examinations.
 - Students attend classes.
 - Professors write books.

- (v) Driver drives a car.
9. Use ER-Diagramming tool to solve the following
- (i) A bill is sent to a customer. A customer can receive many bills.
 - (ii) A clerk works in a bank. The bank has many clerks.
 - (iii) A part is used in many products and a product uses many parts.
 - (iv) Students apply for seats in colleges. Each student can atmost get one seat.
A college has many seats. A student can send many applications.
 - (v) A car is owned by a person. The person can own many cars.
10. Use ER-Diagramming tool to solve the following:
Use any reasonable assumptions. “A machine shop produces many parts which it takes on contract. It employs many machinists who operate any of the machines. A part needs working on only one machine. A record is kept on the quantity of material needed for producing each part. The production of each part is tracked by giving a job number, start time and end time and machinist identification.”
11. Design an input screen using a tool to reserve tickets in a long distance bus.
12. Design an input screen using a tool to enter examination marks of students. Each record has Roll no, Name, Marks in all subjects, total and class.