DVM

Software Modeling & Analysis

TEAM9 김동민, 송현우

목차

Use Case	1.Process stock sales
Actors	Machine
Purpose	Manage stock sales
Overview	If there is a change in stock due to user actions, the stock status is updated
Type	Primary
Cross Reference	R1.1, R2.2, R3.2
Pre-Requisites	Sufficient stock to sale
Typical Courses of Events	1. User : This event is executed when there is enough stock of the item selected by the user. 2. User : the User leaves with the items. 3. Machine : the machine reduces the stock.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	2. Process prepaid item
Actors	Machine
Purpose	Manage stock prepaid
Overview	Item will be offered when code verification is complete
Type	Primary
Cross Reference	R1.2, R2.1, R2.2, R2.3, R2.4. R4.3
Pre-Requisites	Code verification
Typical Courses of Events	1. Machine : This Event is executed when code verification is complete. 2. Machine : The item will be deleted from the prepayment database.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	3. Insert code
Actors	User
Purpose	allow users to enter code
Overview	Enter the code that the user received when making the prepayment into the machine
Type	Primary
Cross Reference	R1.2, R2.1, R2.2, R2.3
Pre-Requisites	Prepayment completed
Typical Courses of Events	1. User : The User enters the code they received when they prepaid.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	4. Offer prepaid item
Actors	Machine
Purpose	Provide prepaid items to user
Overview	Offer the item that a user has prepaid for
Type	Primary
Cross Reference	R1.2, R2.1, R2.2, R2.3
Pre-Requisites	code validation successful
Typical Courses of Events	1. Machine : The machine offers the item that user prepaid. 2. User : The user leaves with items provided by the machine
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	5. Check code
Actors	Machine
Purpose	To validate the code entered by the user
Overview	Checks that the code entered by the user is actually a valid code
Type	Primary
Cross Reference	R1.2, R2.1, R2.2, R2.3, R2.4
Pre-Requisites	Insert code
Typical Courses of Events	1. User : This event is executed after the user insert the code 2. Machine : The machine verifies the code that the user has inserted and the machine has stored
Alternative Courses of Events	...
Exceptional Courses of Events	1. Machine : This event is executed when the verified code is invalid 2. Machine : The machine prints that the code is invalid for the user

2031 Define Essential Use Case

Use Case	6. Dispose code
Actors	Machine
Purpose	To dispose of code that users have used
Overview	Delete the code that the user used from the data
Type	Primary
Cross Reference	R2.3, R2.4
Pre-Requisites	code validation successful
Typical Courses of Events	1. User : This event is executed when the user prepays for an item and takes them away 2. Machine : The machine disposes of the code from database
Alternative Courses of Events	…
Exceptional Courses of Events	…

2031 Define Essential Use Case

Use Case	7. Select item
Actors	User
Purpose	The user selects the desired items from the machine
Overview	The user selects the desired item and number of items from the machine
Type	Primary
Cross Reference	R3.1, R3.2, R3.3
Pre-Requisites	...
Typical Courses of Events	1. User : The user inserts the desired item and number into the machine
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	8. Offer item
Actors	Machine
Purpose	To give the user items of their choice
Overview	The machine offers items that user selected
Type	Primary
Cross Reference	R3.1, R3.2
Pre-Requisites	The items selected by the user exists on this machine
Typical Courses of Events	1. Machine : This use case runs when the user's selected item is in sufficient stock. 2. User : The user insert the card and pays 3. Machine : Provides items to users. 4. User : The user leaves with items provided by the machine
Alternative Courses of Events	...
Exceptional Courses of Events	1. This event is executed when this machine is out of stock 2. The machine prints that the machine is currently out of stock and sends a request to another machine 1. This event is executed when The selected number is larger than max_cnt 2. The machine prints that The number you want to purchase exceeds the maximum number the machine can sell

2031 Define Essential Use Case

Use Case	9. Request stock state
Actors	Machine
Purpose	To request the stock of other machines
Overview	Request other machines the stock of the item that user selected
Type	Primary
Cross Reference	R3.1, R3.3,R3.4,R3.8
Pre-Requisites	The items selected by the user is out of stock in this machine
Typical Courses of Events	1. User : This event is executed when the user's selected item isn't in sufficient stock. 2. Machine : Request stock data to other machines.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	10. Choose whether prepayment
Actors	User
Purpose	To let users choose whether or not to prepay
Overview	Allow users to choose whether they want to prepay or not via buttons.
Type	Primary
Cross Reference	R3.3, R3.4, R3.5
Pre-Requisites	When requesting stock state, the response is that there is enough stock
Typical Courses of Events	1. Machine : This event is executed when the user's selected items isn't in sufficient stock and other machine responsed that it has sufficient stock. 2. User : User select whether prepayment with a button.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	11. Request prepayment state
Actors	Machine
Purpose	To pass the user's prepaid information to other machines
Overview	Passes the information and code for the items that user selected to other machines.
Type	Primary
Cross Reference	R3.4, R3.5, R3.6
Pre-Requisites	The user selects the prepayment
Typical Courses of Events	1. User : This event is executed when the user selects the prepayment. 2. Machine : Request prepayment state to closest machine.
Alternative Courses of Events	...
Exceptional Courses of Events	1. Responding to a prepayment request that it is not possible 2. Send a prepayment request to the closest machine after the machine you sent the previous request 3. All machines responding that it is impossible to make a prepayment request 4. Print Prepayment Impossible error

2031 Define Essential Use Case

Use Case	12. Make code
Actors	Machine
Purpose	Create a code to send to requests for prepayment
Overview	The machine generates a code to send a prepayment request and sends a prepayment request to another with the request format
Type	Primary
Cross Reference	R3.4, R3.5, R3.6
Pre-Requisites	The user selects the prepayment
Typical Courses of Events	1. User : This event is executed when user selects prepayment 2. Machine : Creates a 10-character string containing lowercase letters and numbers.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	13. Print coordinate and code
Actors	Machine
Purpose	Prints coordinates and codes to allow users to receive prepaid items
Overview	After receiving a response that it is possible to prepayment, print the coordinates to the machine and code
Type	Primary
Cross Reference	R3.5, R3.6, R3.7
Pre-Requisites	Responding to a prepayment request that it is possible
Typical Courses of Events	1. Machine : This event is executed after use case number 11. 2. User : The user insert the card and pays 3. Machine : Coordinate and code of the machine are print on the screen.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	14. Print coordinate
Actors	Machine
Purpose	To provide the coordinates of the machine where the use's selected item is in stock
Overview	The screen outputs the coordinates of the machine that has enough of the user's selected item in stock
Type	Primary
Cross Reference	R3.4, R3.8
Pre-Requisites	When choosing whether to prepayment or not, respond NO
Typical Courses of Events	1. User : This event is executed when user choose not to prepay. 2. Machine : Coordinate of the machine is print on the screen.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	15. Response stock state
Actors	Machine
Purpose	Responding to the stock state request from another machine
Overview	Response the stock status of a specific items requested by another machine
Type	Primary
Cross Reference	R4.1
Pre-Requisites	Another machine requested stock state
Typical Courses of Events	1. Machine : This event is executed when other machine request stock state. 2. Machine : Response with stock state of the requested item and the machine's coordinate.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	16. Response prepayment state
Actors	Machine
Purpose	To handle when another machine requests a prepayment
Overview	Process the prepayment information requested by other machines
Type	Primary
Cross Reference	R4.2, R4.3
Pre-Requisites	Another machine requested stock state
Typical Courses of Events	1. Machine : This evemt is executed when other machine request prepayment. 2. Machine : If the machine has enough stock and does not exceed the maximum number of sales, response true state. If not, response with false state. 3. Machine : If machine response true state, remove the prepaid items from the stock and store the items in the prepayment table
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	17. Store code
Actors	Machine
Purpose	To store the prepayment information requested by another machine
Overview	Store the code of the prepayment requested by another machine in the table
Type	Primary
Cross Reference	R4.2, R4.3
Pre-Requisites	this machine respond true to a prepayment request from another machine
Typical Courses of Events	1. This event is executed When this machine respond true to a prepayment request from another machine 2. The machine Store the code in the code table
Alternative Courses of Events	...
Exceptional Courses of Events	1. If a duplicate code exists in the code table, a duplicate error is output

2031 Define Essential Use Case

Use Case	21. Insert card data
Actors	User
Purpose	To preceed with payment for the selected items
Overview	The user enters the card information to proceed with the payment
Type	Primary
Cross Reference	R3.2, R3.7, R6.1
Pre-Requisites	1. The user selects the desired item and the items are in sufficient stock 2. Responding to a prepayment request that it is possible
Typical Courses of Events	1. User : This use case is executed when the user makes a payment or prepayment. 2. User : User insert card data into input.
Alternative Courses of Events	...
Exceptional Courses of Events	...

2031 Define Essential Use Case

Use Case	22. Check card data
Actors	Machine
Purpose	To verify if there is a balance on the card
Overview	If there is a change in stock due to user actions, the stock status is updated
Type	Primary
Cross Reference	R6.1, R6.2
Pre-Requisites	User insert card data
Typical Courses of Events	1. Machine : This use case is executed after user inserts card data 2. Machine : The machine verifies that the inserted card has a sufficient balance
Alternative Courses of Events	...
Exceptional Courses of Events	1. If the card information does not exist, it outputs an error 2. If the card's balance is not sufficient, an error will be output

2031 Define Essential Use Case

Draw a conceptual class diagram and add attributes
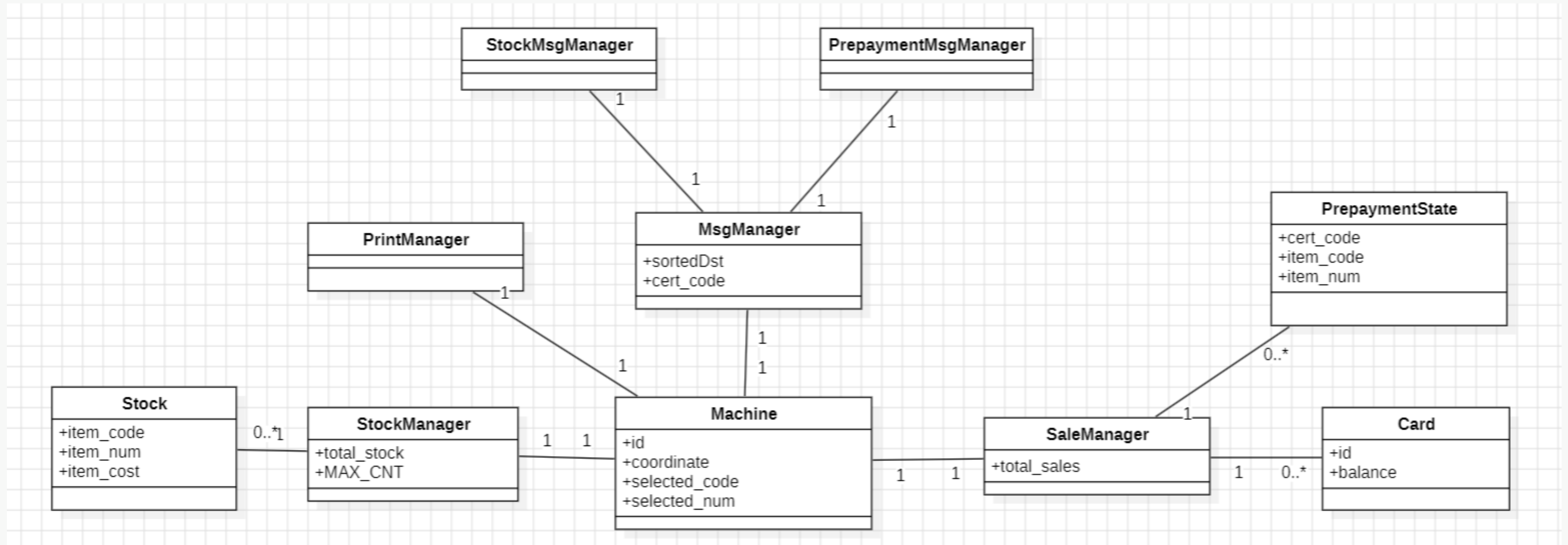
2033 Define Domain Model

Glossary	Description
Machine.id:String	Machine id
Machine.coordinate:Object	Machine coordinate
StockManager.MAX_CNT:int	The maximum number of items each can be sold
Machine.selected_code:int	Code of the item selected by the user
Machine.selected_num:int	Quantity of item selected by user
StockManager.total_stock:int	Total number of stock
Stock.item_code:int	Item code
Stock.item_number:int	Number of item stock
Stock.item_cost:int	Item cost

2034 Refine Glossary

Glossary	Description
SalesManager.total_sales:int	Total sales amount
Card.id:String	Card id
Card.balance:int	Card balance
PrepaymentState.code:String	Prepayment code
PrepaymentState.item_code:int	Code of prepaid item
PrepaymentState.item_num:int	Number of prepaid item
MsgManager.sortedDst	Destination's ID & Coordinate ordered in close distance
MsgManager.cert_code:String	The code for the prepayment request

2034 Refine Glossary

Use Case 1.Process stock sales
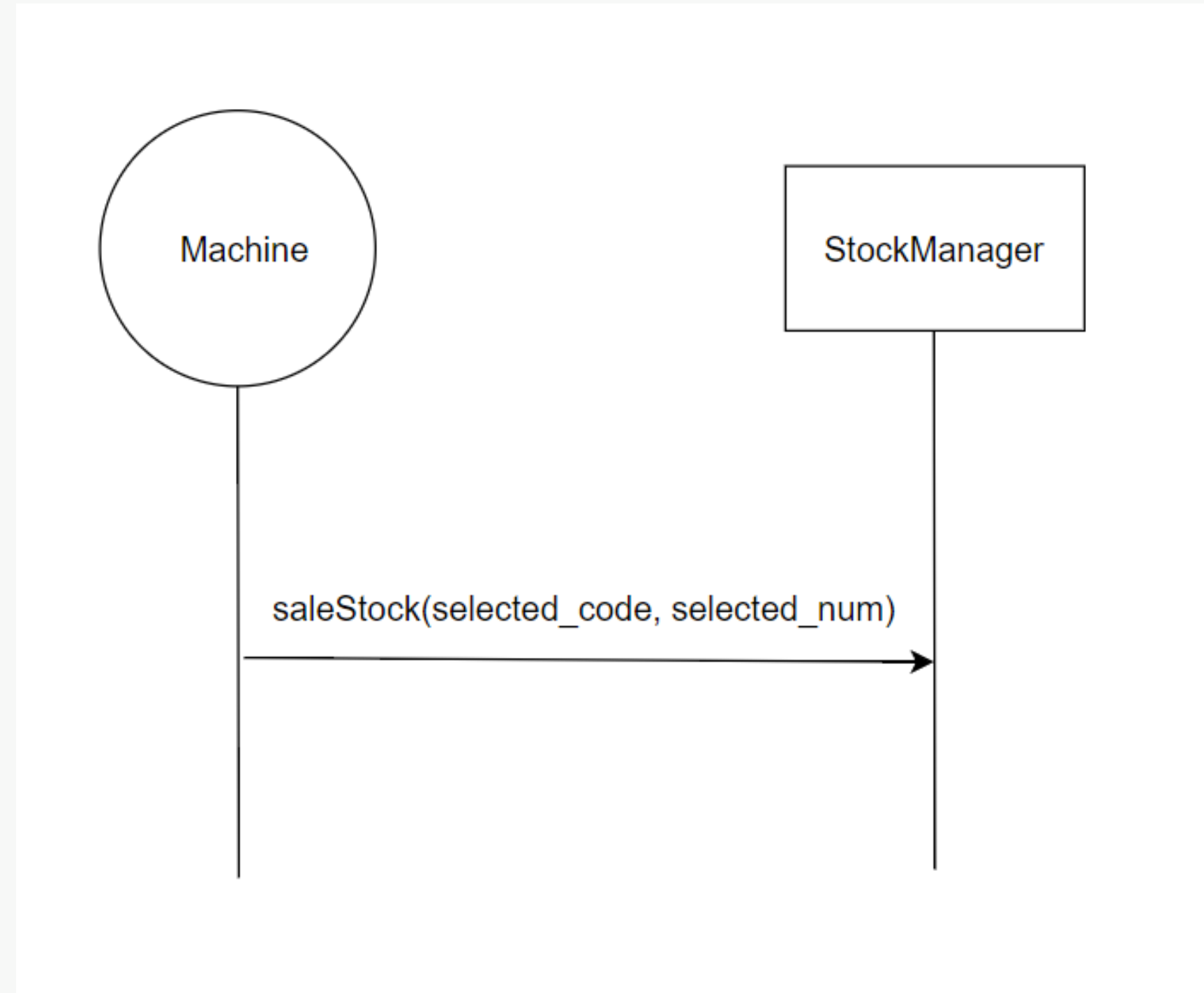
2035. Define System Sequence Diagrams

Use Case 2. Process prepaid item
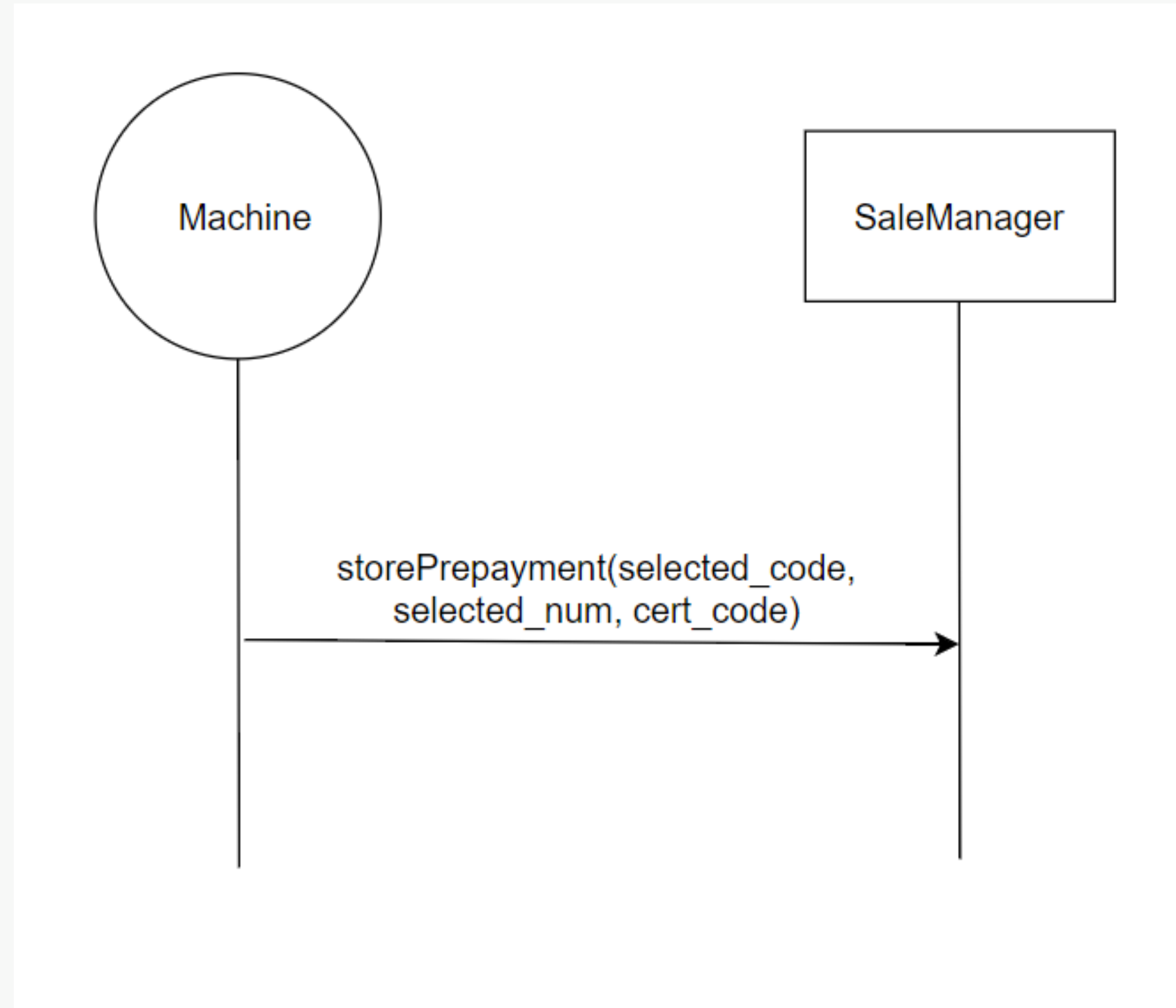
2035. Define System Sequence Diagrams

Use Case 3. Insert code
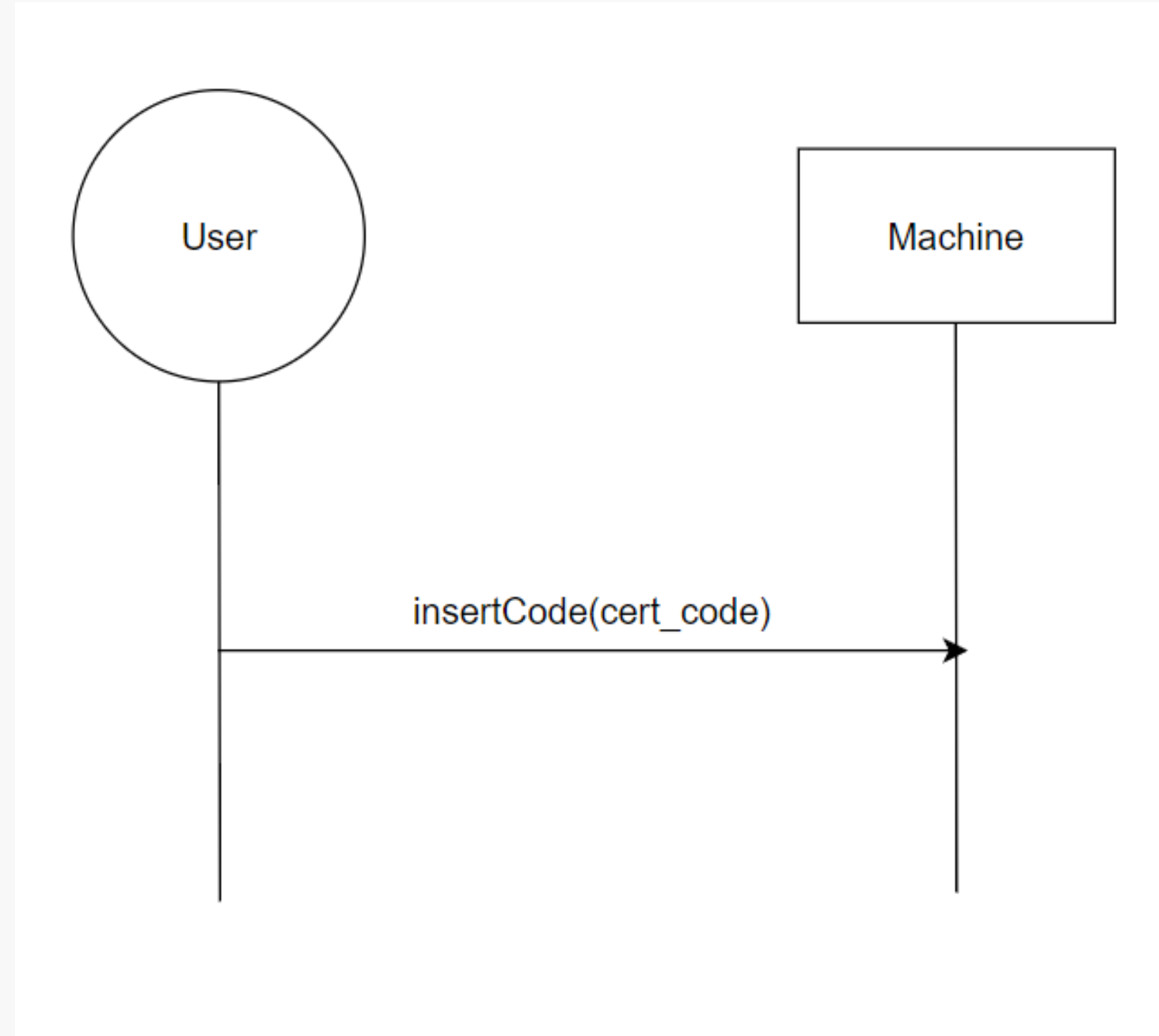
2035. Define System Sequence Diagrams

Use Case 4. Offer prepaid item
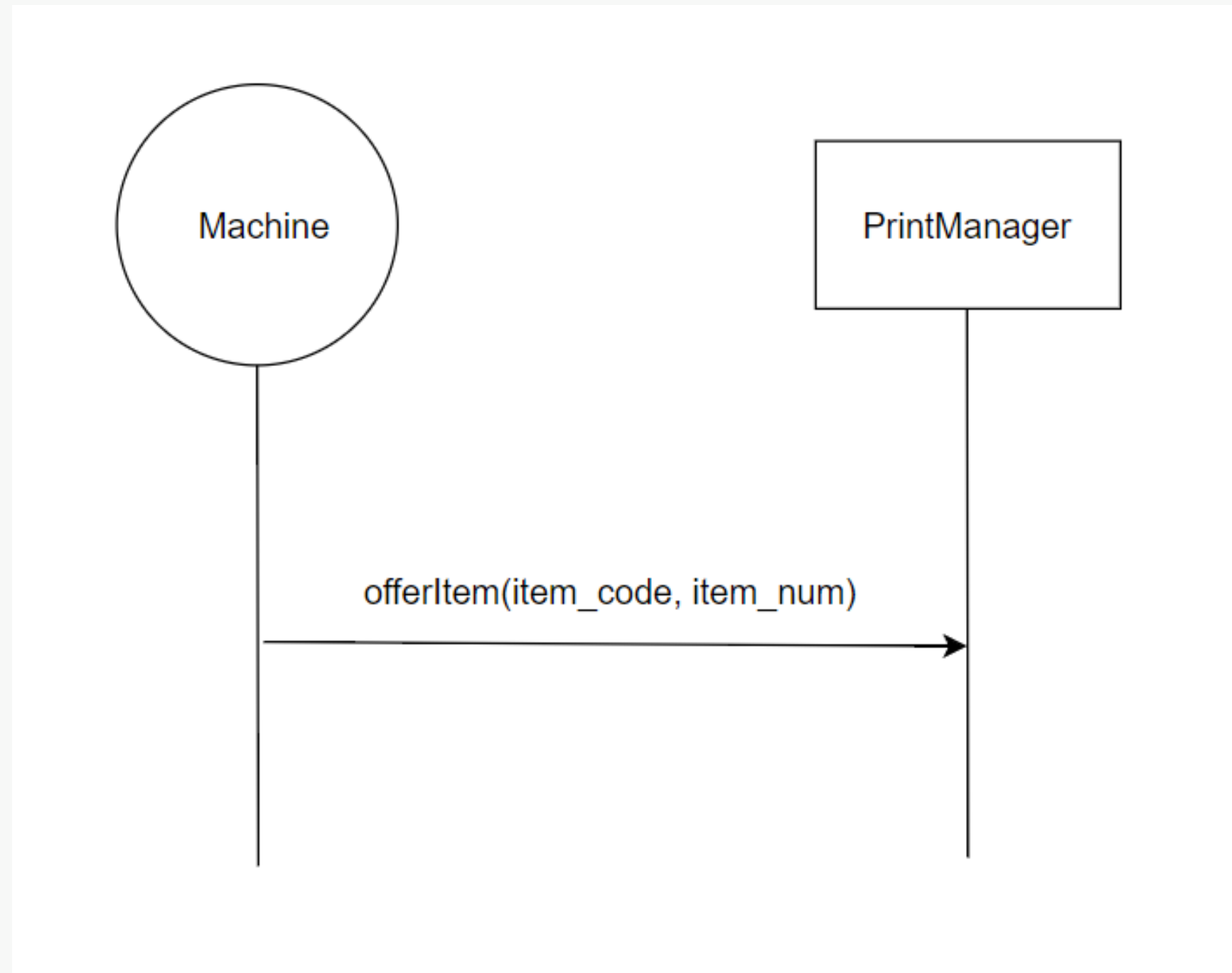
2035. Define System Sequence Diagrams

Use Case 5. Check code
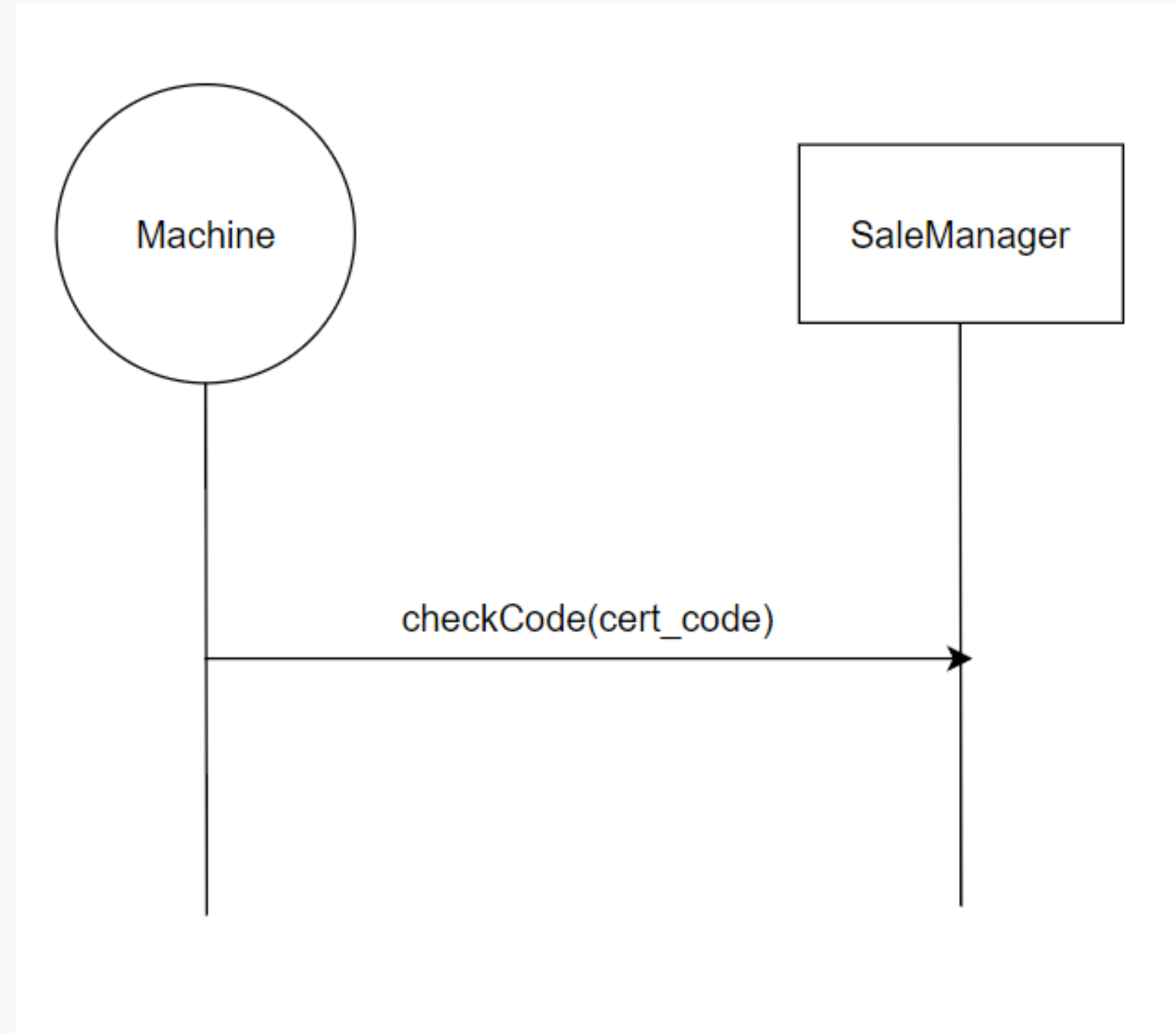
2035. Define System Sequence Diagrams

Use Case 6. Dispose code
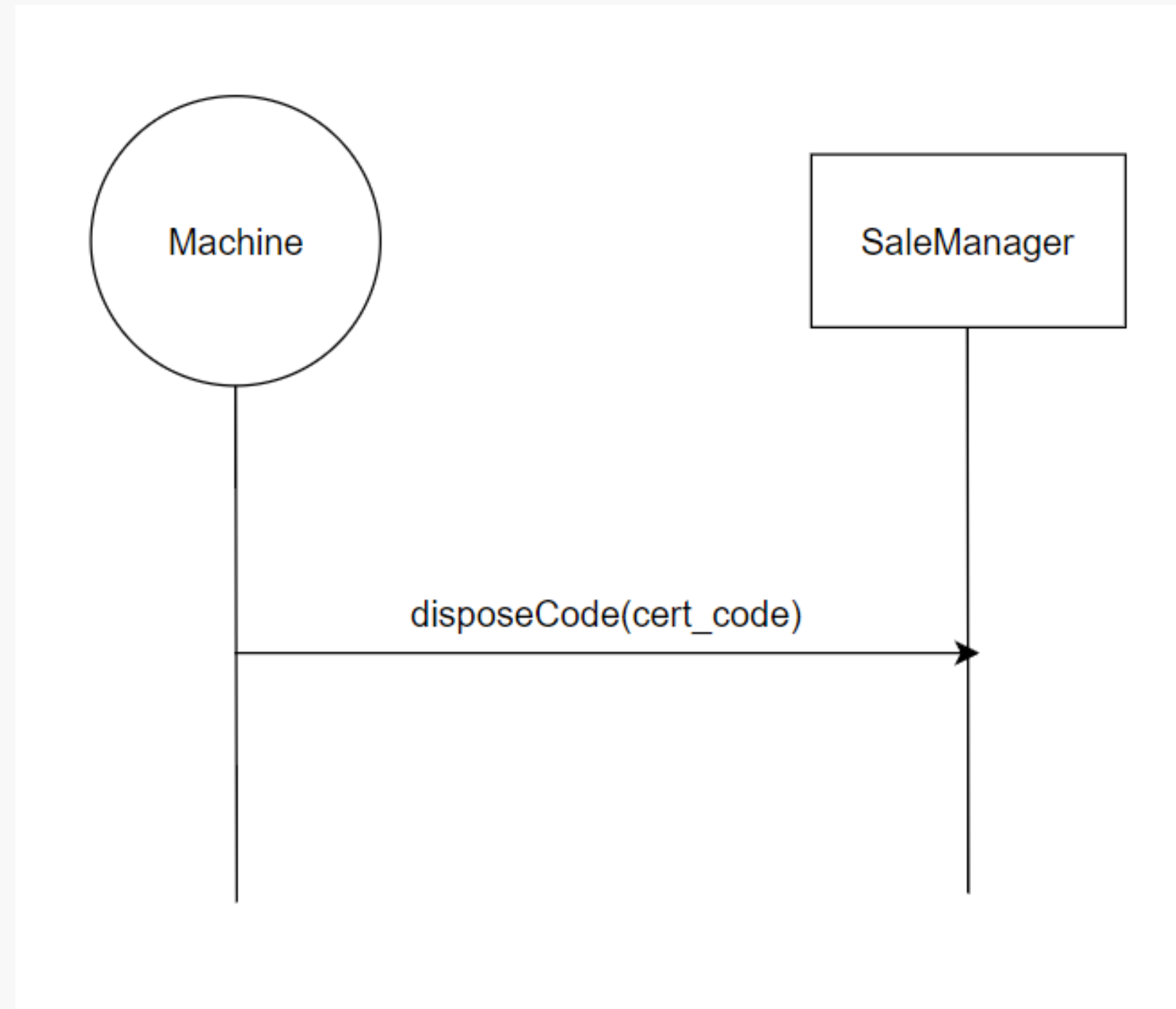
2035. Define System Sequence Diagrams

Use Case 7. Select item
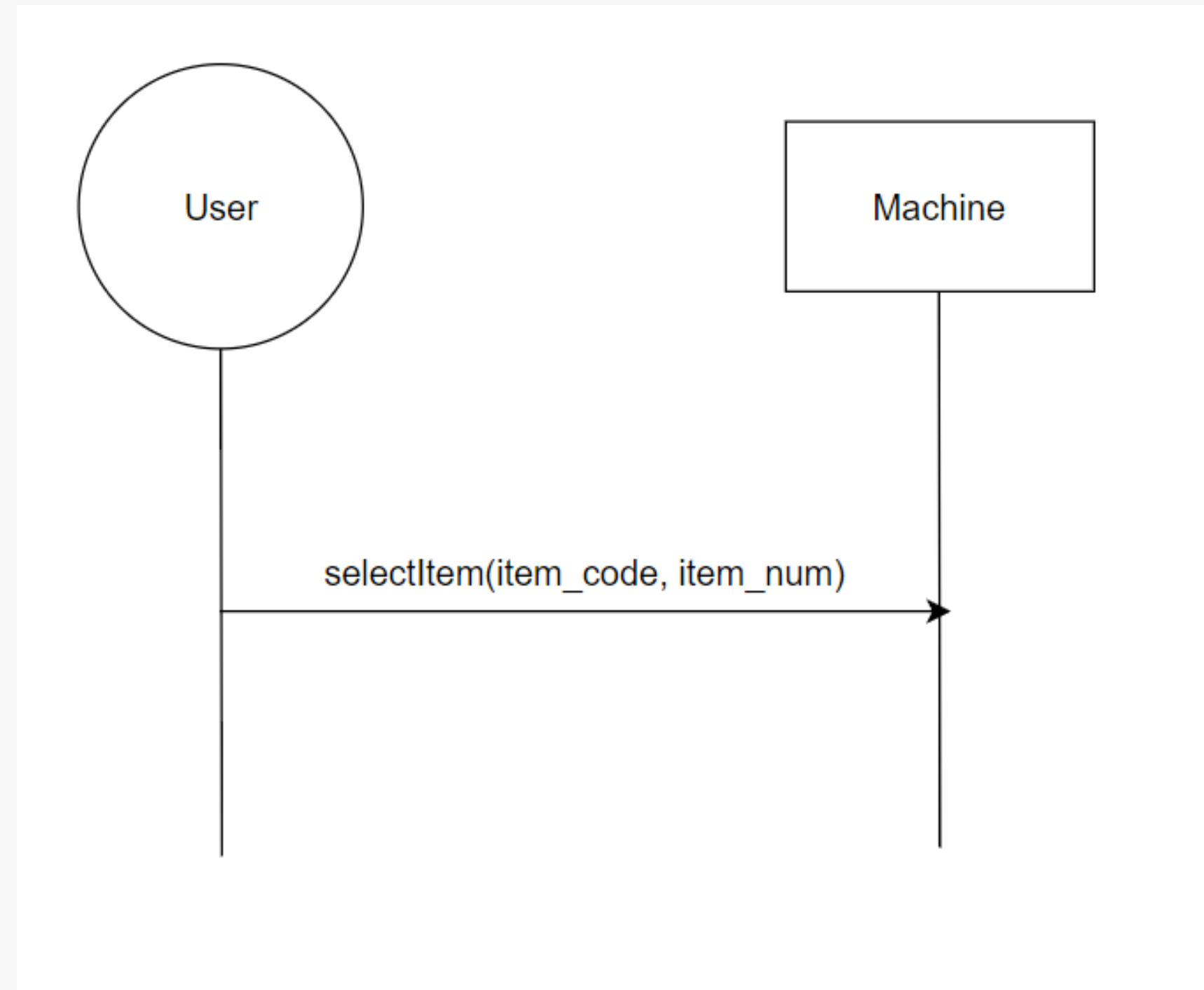
2035. Define System Sequence Diagrams

Use Case 8. Offer item
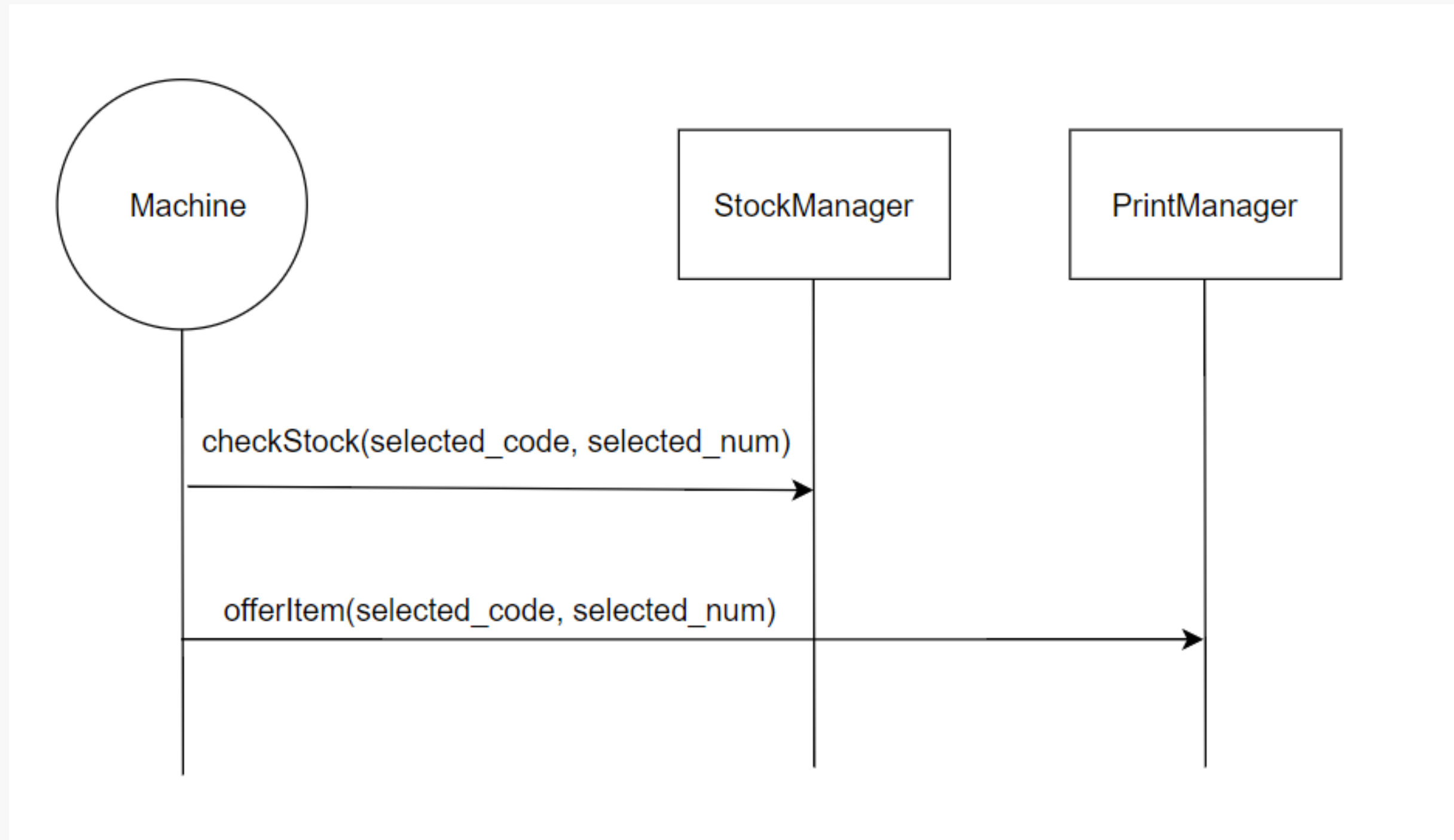
2035. Define System Sequence Diagrams

Use Case 9. Request stock state
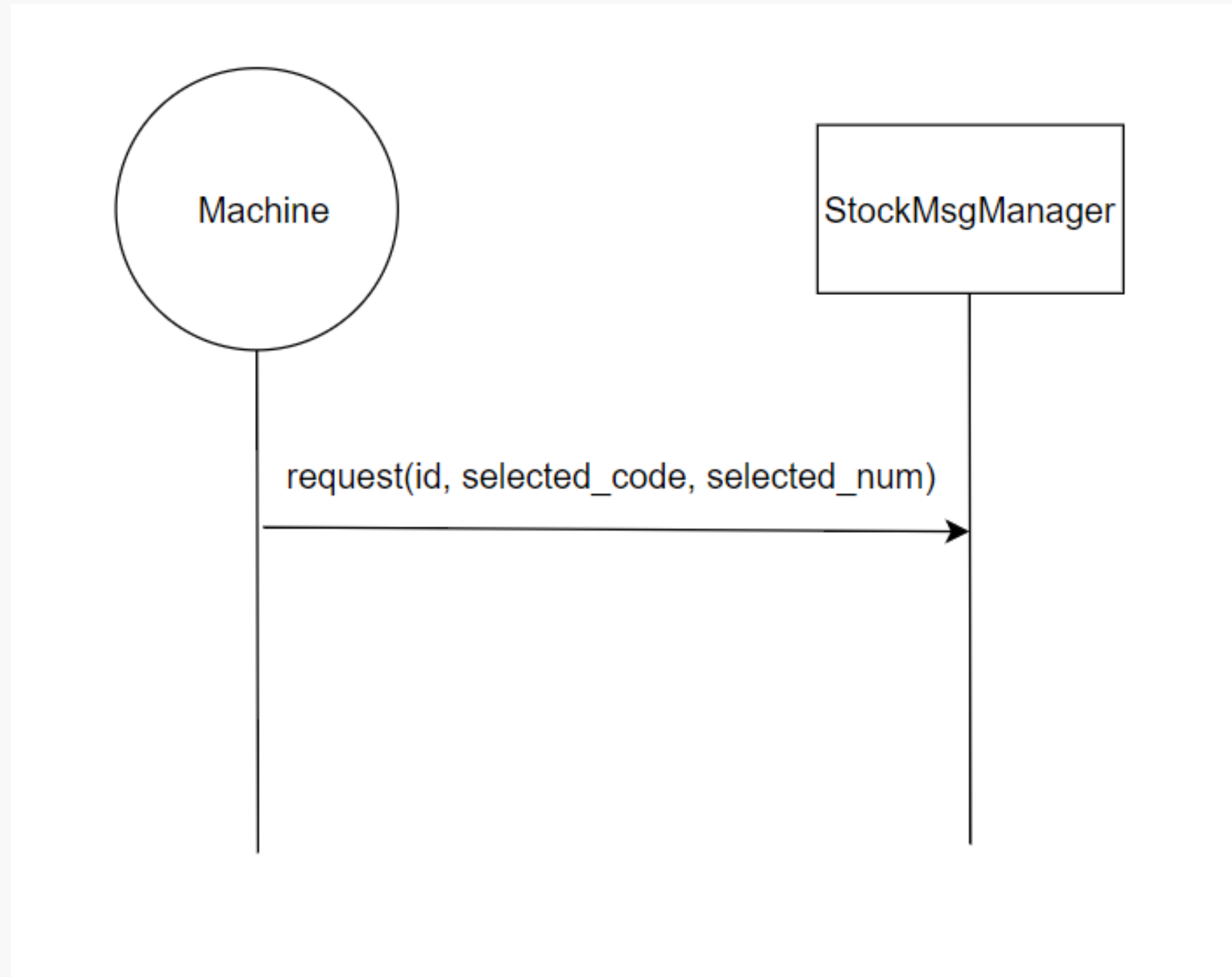
2035. Define System Sequence Diagrams

Use Case 10. Choose whether prepayment
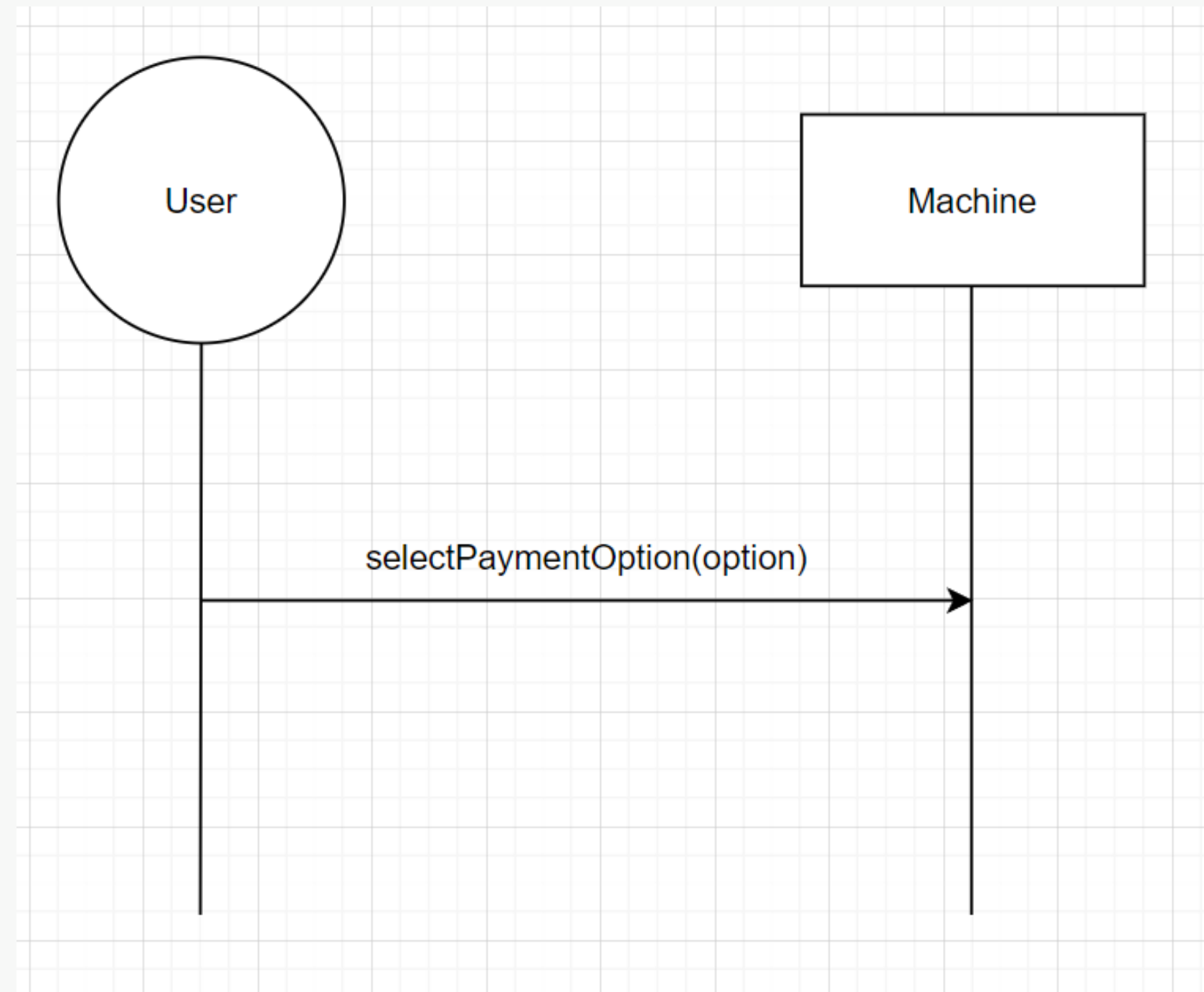
2035. Define System Sequence Diagrams
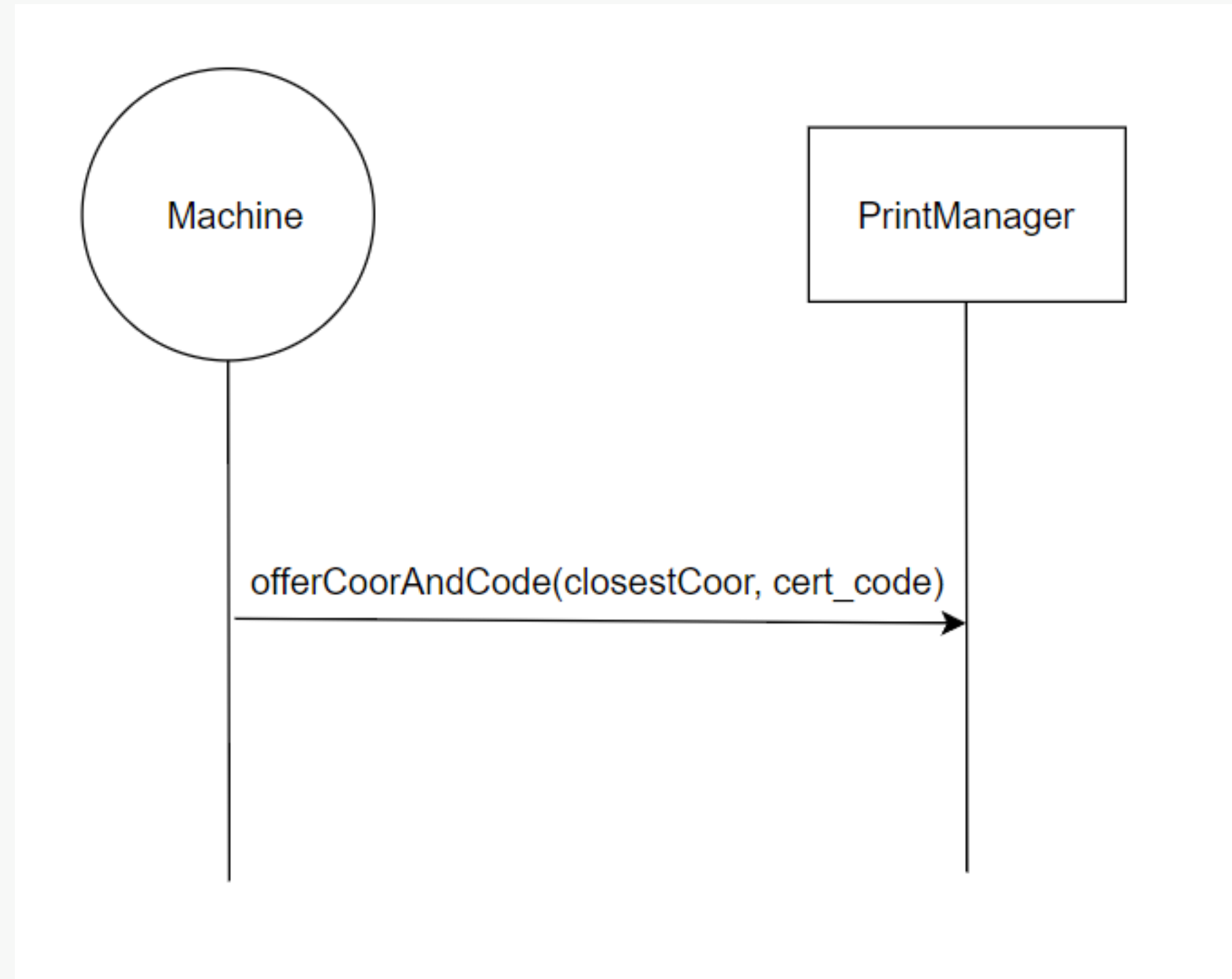
Use Case 11. Request prepayment state

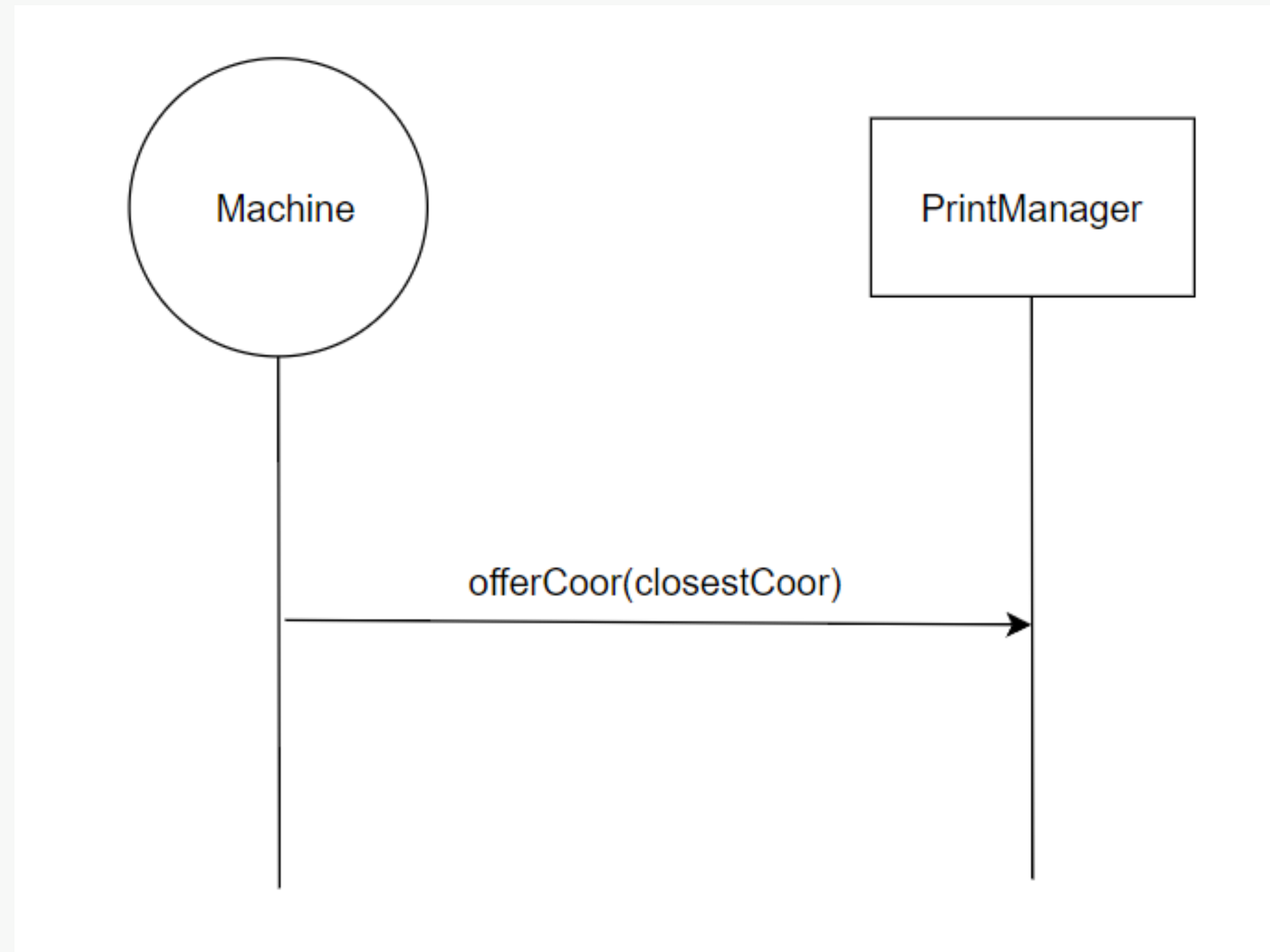## 2035. Define System Sequence Diagrams
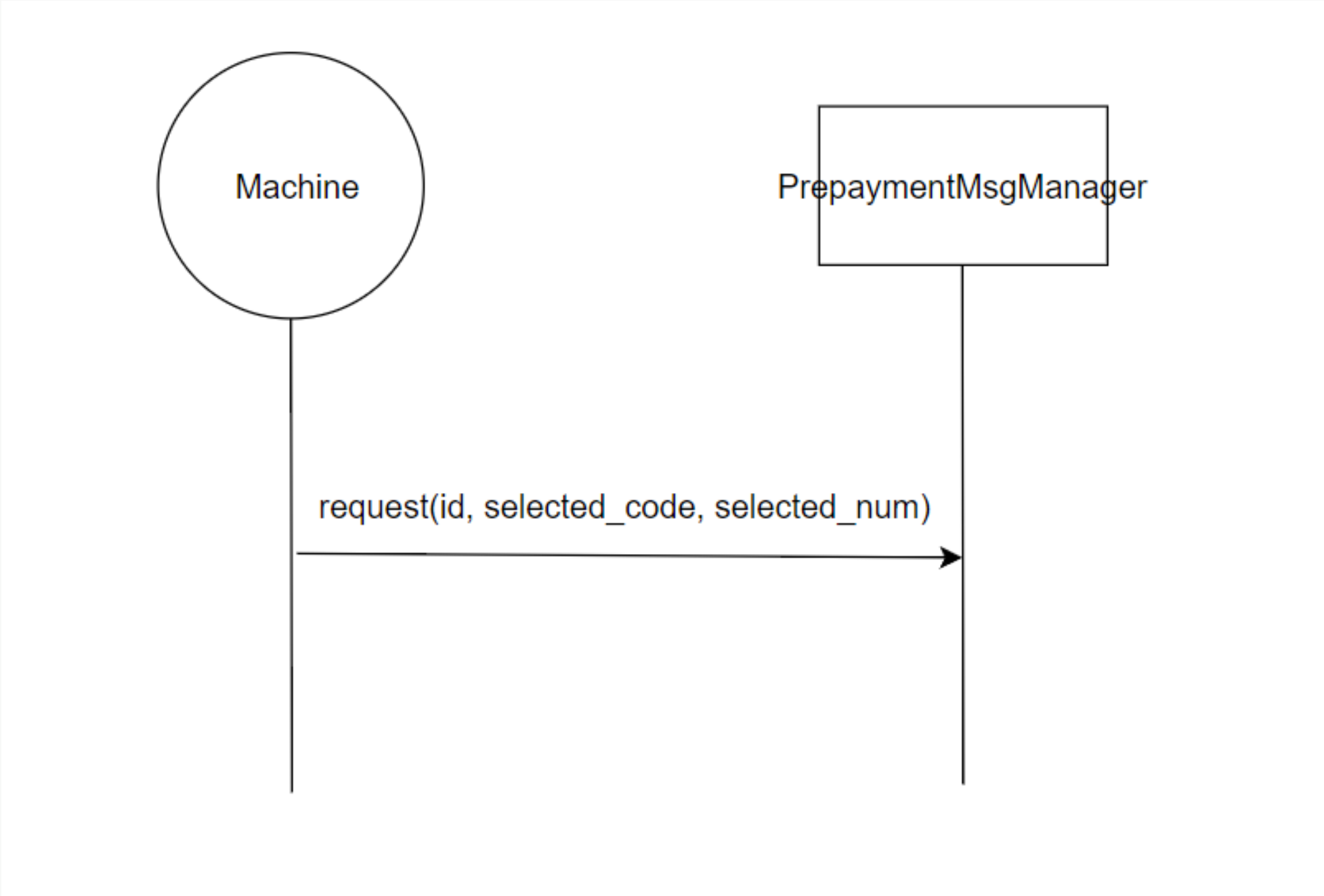
Use Case 12. Make code
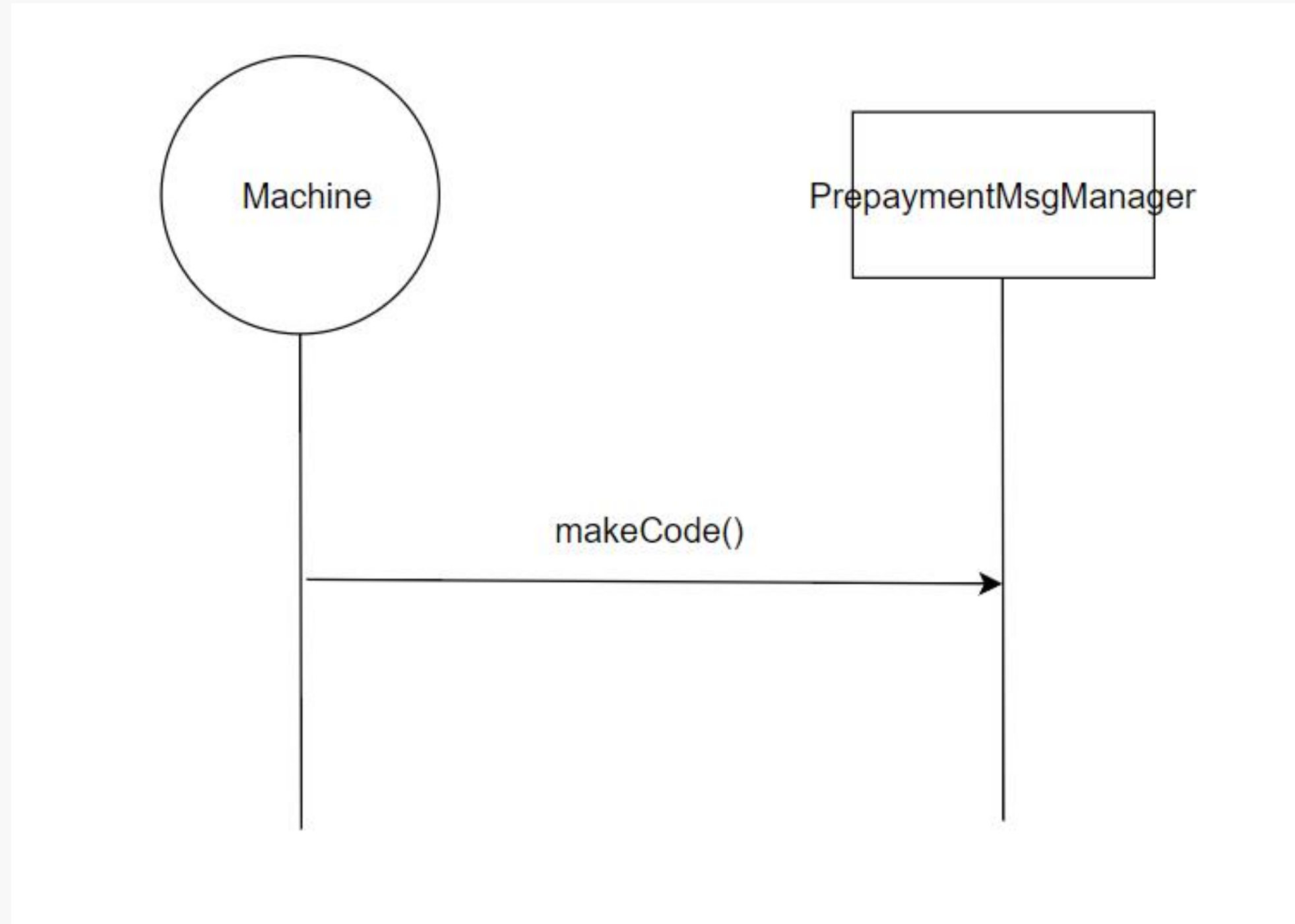
2035. Define System Sequence Diagrams

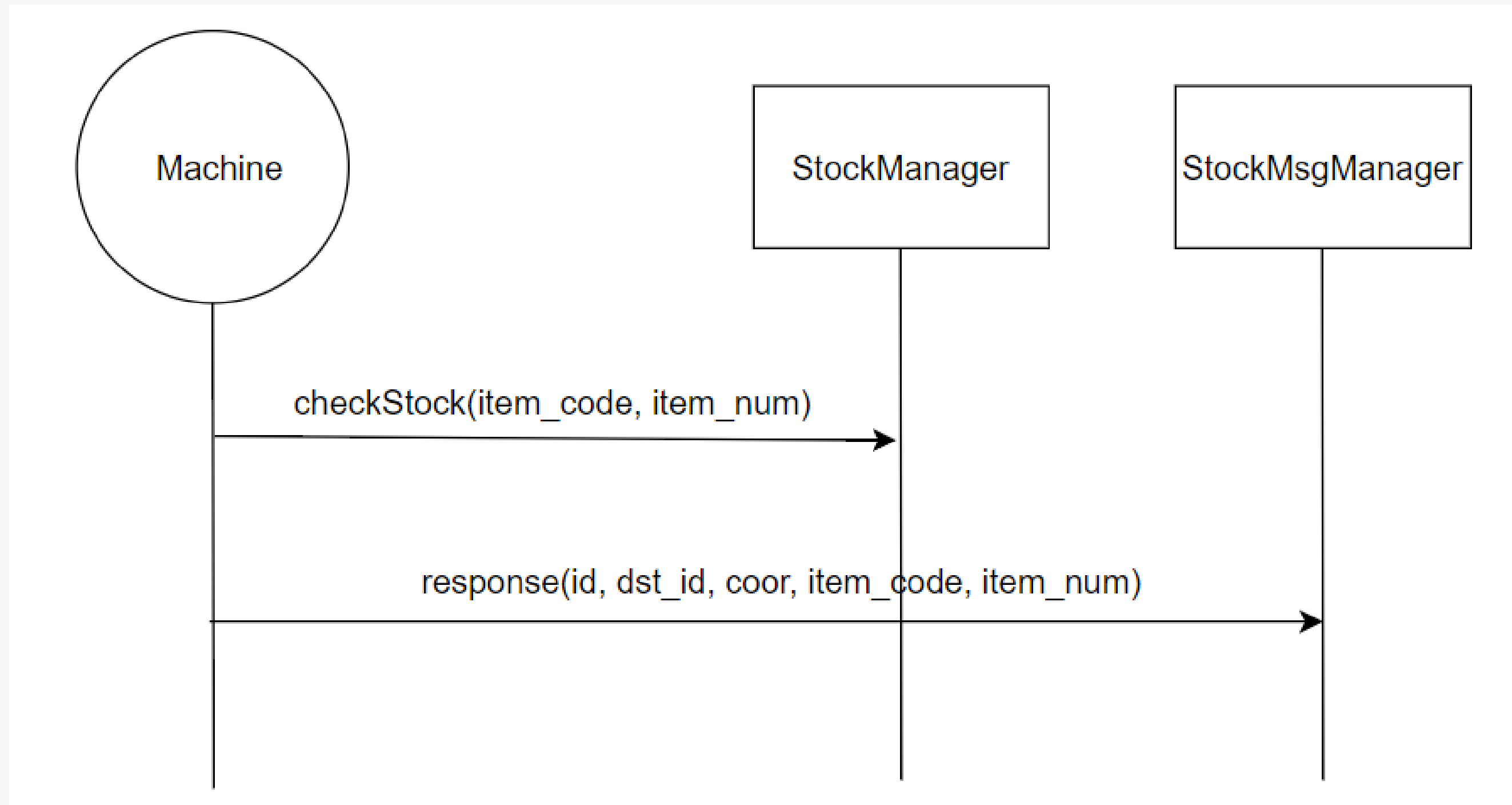# Use Case 13. Print coordinate and code

2035. Define System Sequence Diagrams
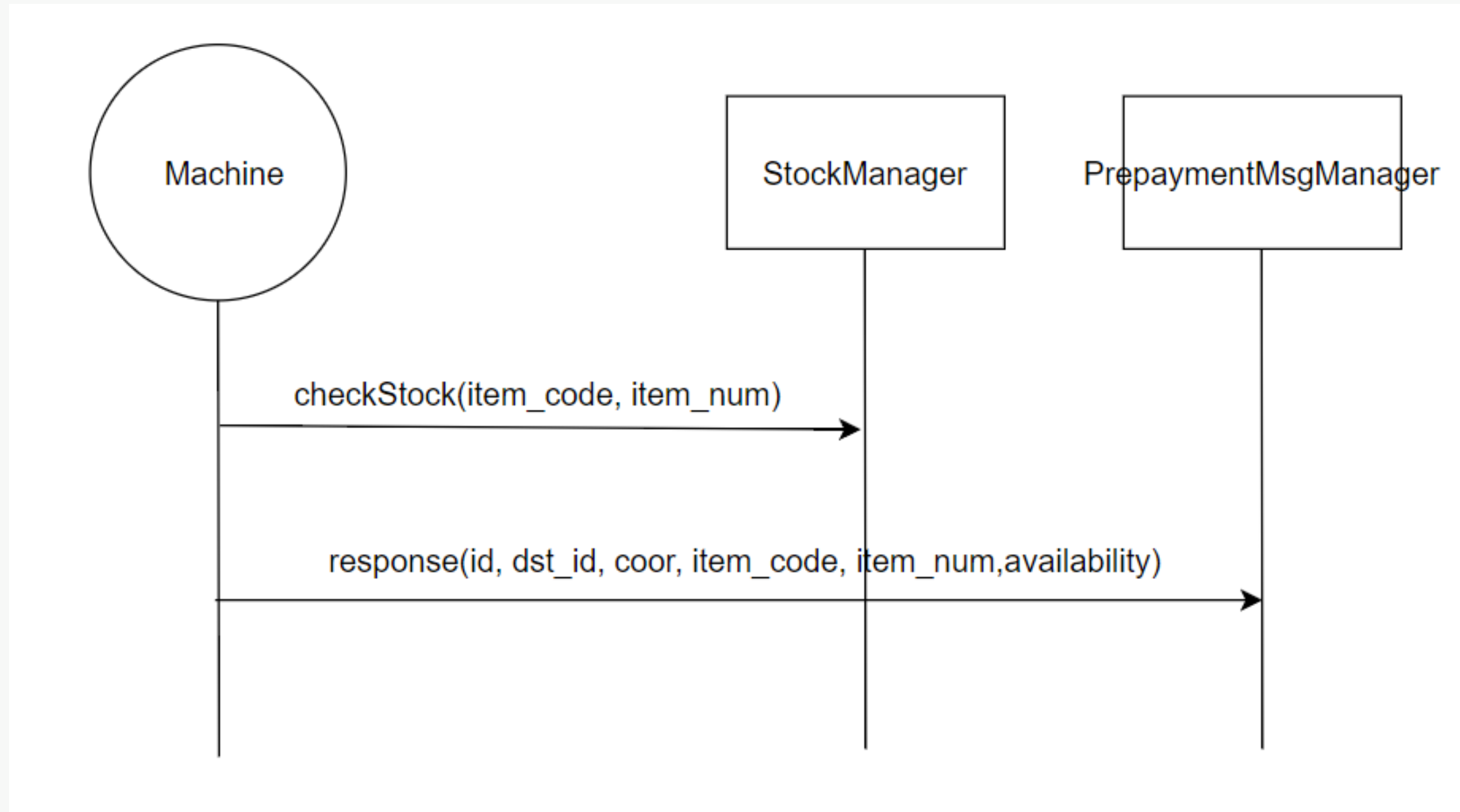
Use Case 14. Print coordinate

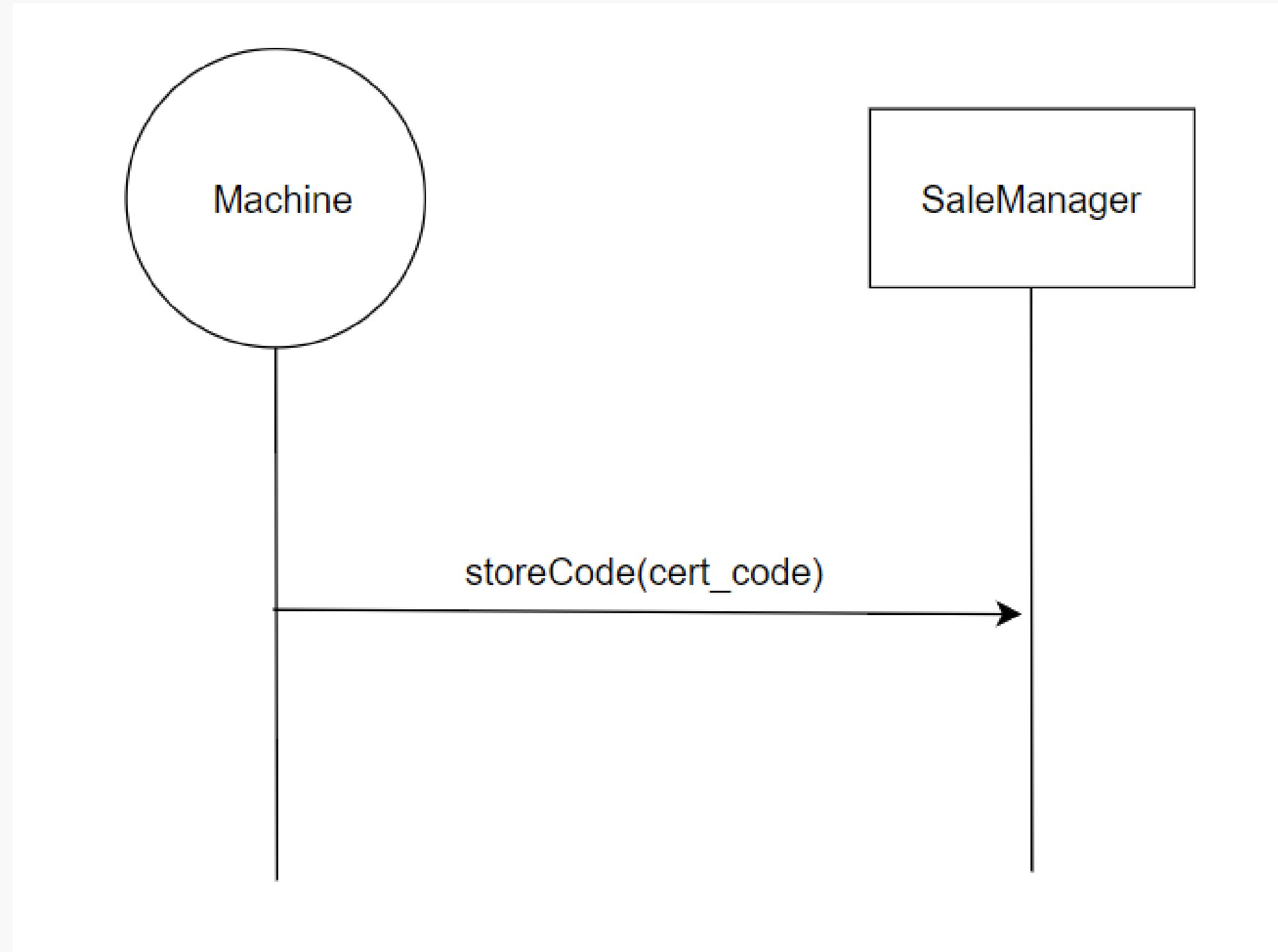## 2035. Define System Sequence Diagrams

Use Case 15. Response stock state

2035. Define System Sequence Diagrams
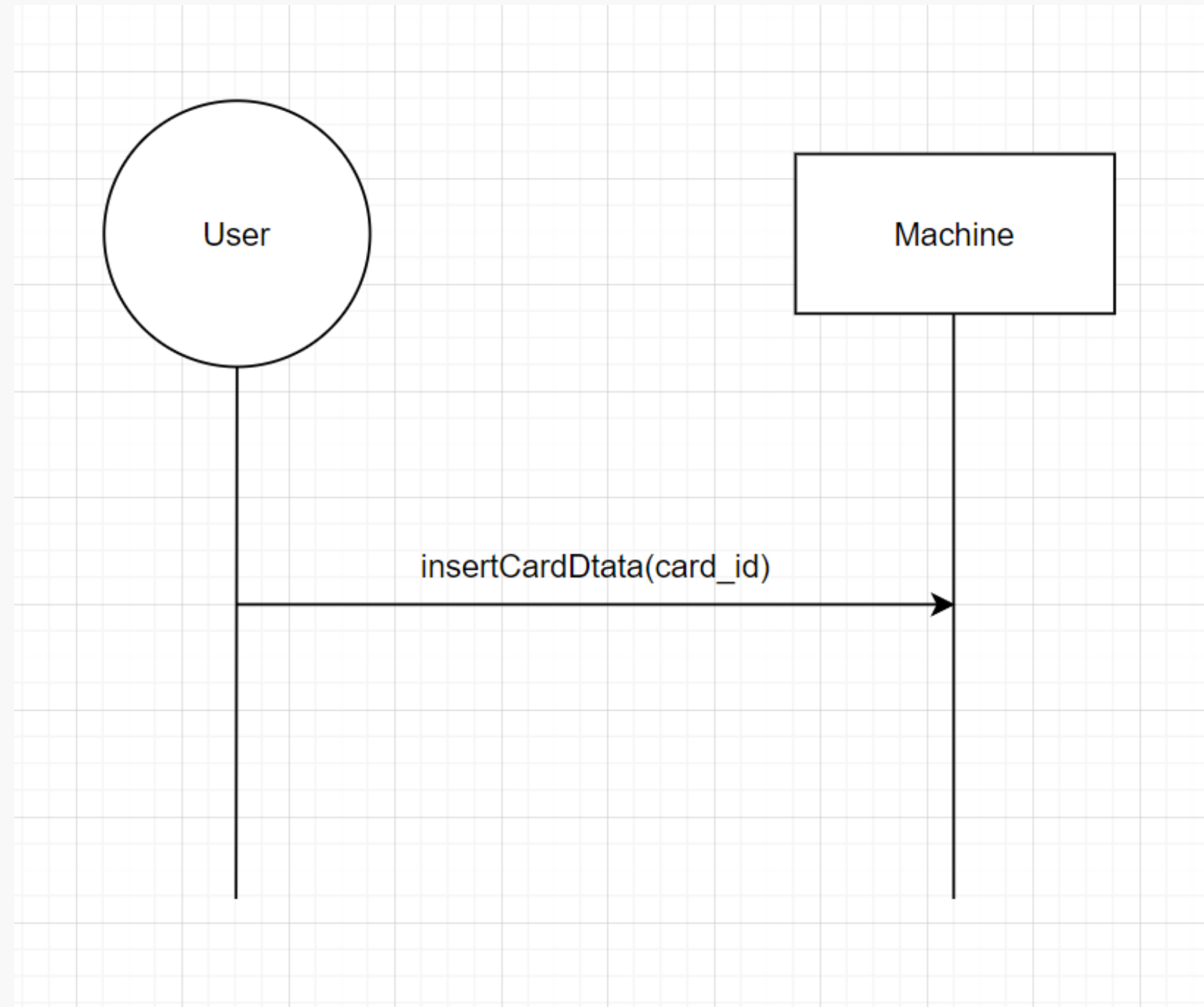
Use Case 16. Response prepayment state

2035. Define System Sequence Diagrams

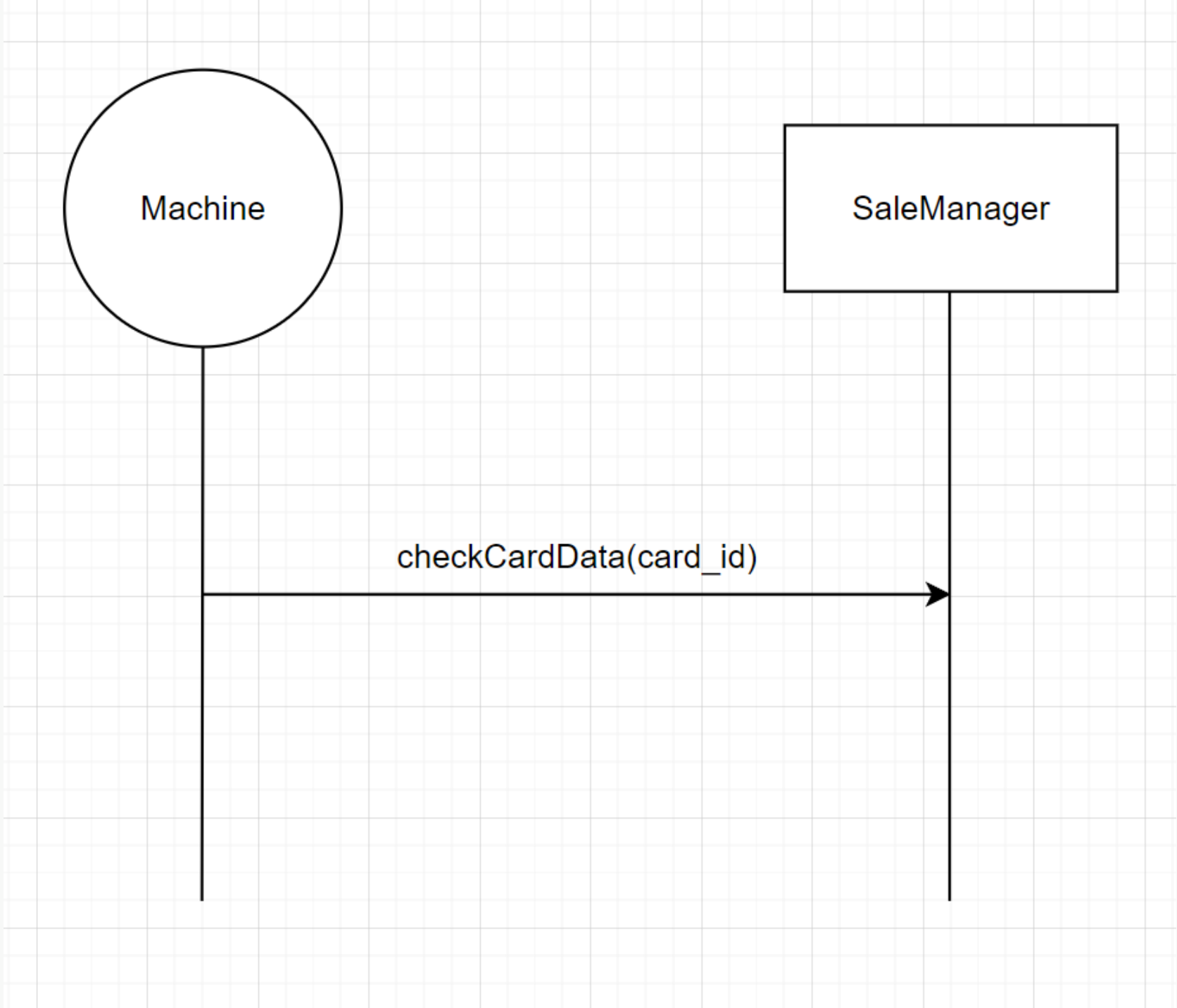# Use Case 17. Store code

2035. Define System Sequence Diagrams

Use Case 21. Insert card data

2035. Define System Sequence Diagrams

Use Case 22. Check card data

2035. Define System Sequence Diagrams

Test Number	Test 항목	Description	Use case	System Function
1	재고 판매 시험	남은 재고를 초과한 구매 시도	1.Process stock sales	R 1.1
2	재고 선결제 시험	남은 재고를 초과한 구매 시도	2. Process prepaid item	R 1.2
3	인증코드 입력 시험	저장한 인증코드와 동일하게 입력 시 정상 동작하는지 시도	3. Insert code	R 2.1
4	선결제 제공 시험	유저에게 정상적으로 제공하는지 시도	4. Offer prepaid item	R 2.2
5	인증코드 검증 시험	유효하지 않은 코드 입력 시도	5. Check code	R 2.3
6	인증코드 파기 시험	정상 인증 후 동일한 코드 입력 시도	6. Dispose code	R 2.4
7	음료 선택 시험	유저가 선택한 음료가 제공되는지 시도	7. Select item	R 3.1
8	음료 제공 시험	유저에게 정상적으로 제공하는지 시도	8. Offer item	R 3.2

2038. Refine System Test Case

Test Number	Test 항목	Description	Use case	System Function
9	재고 요청 시험	응답이 올바르게 오는 지 시도	9. Request stock state	R 3.3
10	선결제 선택 시험	유저가 선택한 대로 동작하는 지 시도	10. Choose whether prepayment	R 3.4
11	선결제 가능 요청 시험	응답이 올바르게 오는 지 시도	11. Request prepayment state	R 3.5
12	인증코드 생성 시험	인증코드가 무작위로 생성되는 지 시도	12. Make code	R 3.6
13	좌표 및 인증코드 출력 시험	좌표와 인증코드를 올바르게 출력하는지 시도	13. Print coordinate and code	R 3.7
14	좌표 출력 시험	좌표를 올바르게 출력하는지 시도	14. Print Coordinate	R 3.8
15	재고 응답 시험	요청을 올바르게 처리하는지 시도	15. Response stock state	R 4.1

2038. Refine System Test Case

Test Number	Test 항목	Description	Use case	System Function
16	선결제 응답 시험	요청을 올바르게 처리하는지 시도	16. Response prepayment state	R 4.2
17	인증코드 기록 시험	보낸 인증 코드를 올바르게 저장하는 지 시도	17. Store code	R 4.3
18	재고 부족 에러 출력 시험	재고 부족시 에러를 올바르게 출력하는 지 시도	18. Print out of stock error	R 5.1
19	인증코드 검증 에러 시험	인증 코드가 유효하지 않을 때 에러를 올바르게 출력하는지 시도	19. Print invalidate code error	R 5.1
20	선결제 불가능 에러 출력 시험	선결제 불가능 시 에러를 올바르게 출력하는지 시도	20. Print Prepayment Impossible error	R 5.1
21	카드 정보 입력 시험	카드의 정보를 올바르게 입력받는지 시도	21. Insert card data	R 6.1
22	카드 정보 검증 시험	카드의 정보를 올바르게 검증하는지 시도	22. Check card data	R 6.2

2038. Refine System Test Case

Test Number	Test 항목	Description	Use case	System Function
23	최대 판매 개수 시험	최대 판매 개수를 넘어선 판매 요청 시도	1.Process stock sales	R 1.1
24	거리 순 정렬 동작 시험	재고 상태 요청 시 받은 좌표 정렬 시도	9. Request stock state	R 3.3
25	총 재고 개수 기록 시험	재고 관련 동작 시 총 재고가 올바르게 기록되는 지 시도	1.Process stock sales	R 1.1
26	총 판매 액수 기록 시험	판매 관련 동작 시 총 판매 액수가 올바르게 기록되는 지 시도	1.Process stock sales	R 1.1

2038. Refine System Test Case (improved)
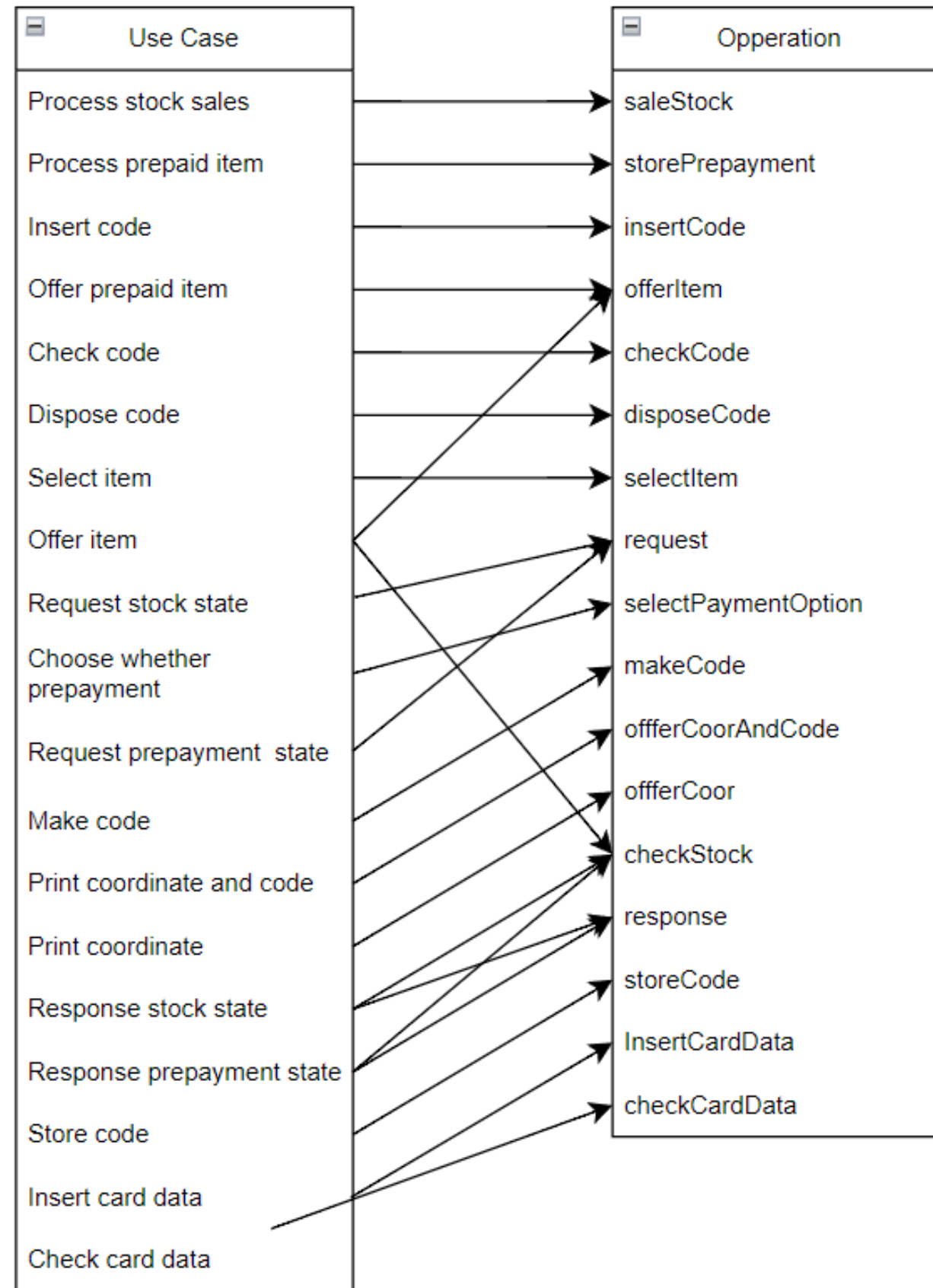
2039. Analyze Traceability Analysis

경청해주셔서
감사합니다

TEAM9   김동민, 송현우