

# 13016235: C Programming

First Semester, 2020

## Project Proposal

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1. Project developer

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2. Project title

C Blackjack
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3. Project description and requirements

**Project description:**

This project simulates the game called “Blackjack” which is played in casino inside the terminal. The objective of the game is to get the highest amount of money possible. Just like real blackjack, the player starts off with some money (1000\$). The player will then bet their way through the game fighting against the dealer, hopefully getting lucky and earning as much money as possible.

- (In the attached file there is flowchart which explain the game in a more clear manner)
- (As well as some pseudocode)

## Project requirements:

### ### Program Specification/Requirement ###

The program is supposed to partly replicate the game of blackjack, which is played in a casino

Each component of the game has broken down into the functions below

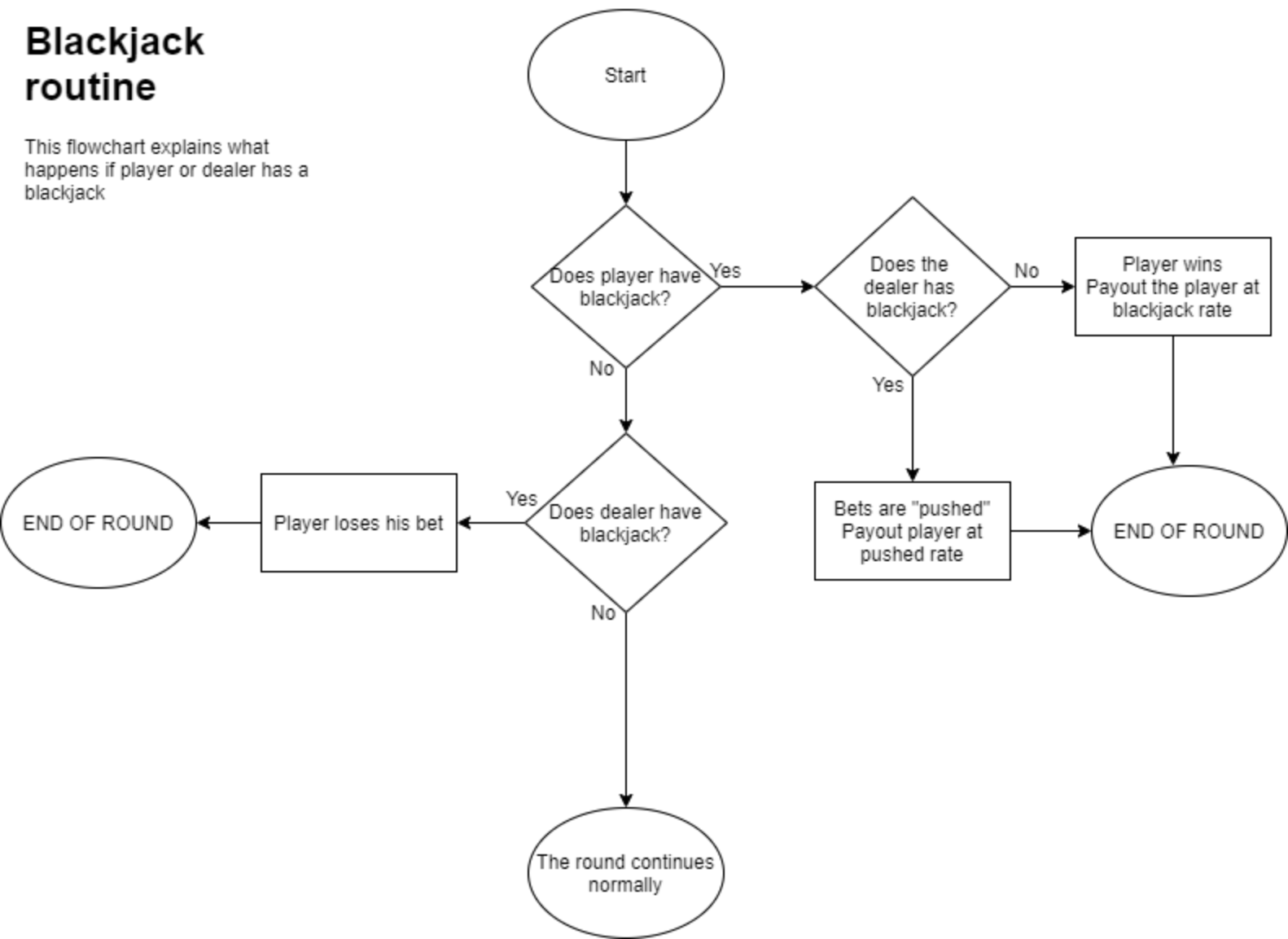
### ### Functions required ###

- Find value of a card
- Finding the value of the hand
  - Pre-round routine
    - Clear the dealer hand
    - Clear the player hand
    - Clear the player bets
  - Set player hand state to be playing
  - Input validation for the bet
- Input validation for the playing decision
- Input validation for choosing whether to keep playing
  - Displaying hands (with option for hidden card)
    - Checking for sufficient money
  - Generate a random card and hit card to hand
    - Generate card
    - Appending it to the hand
  - Check for blackjack in hand
  - Check for busted hand
- Check if player is allowed to double down

(A flowchart is made for any long/harder to understand function)

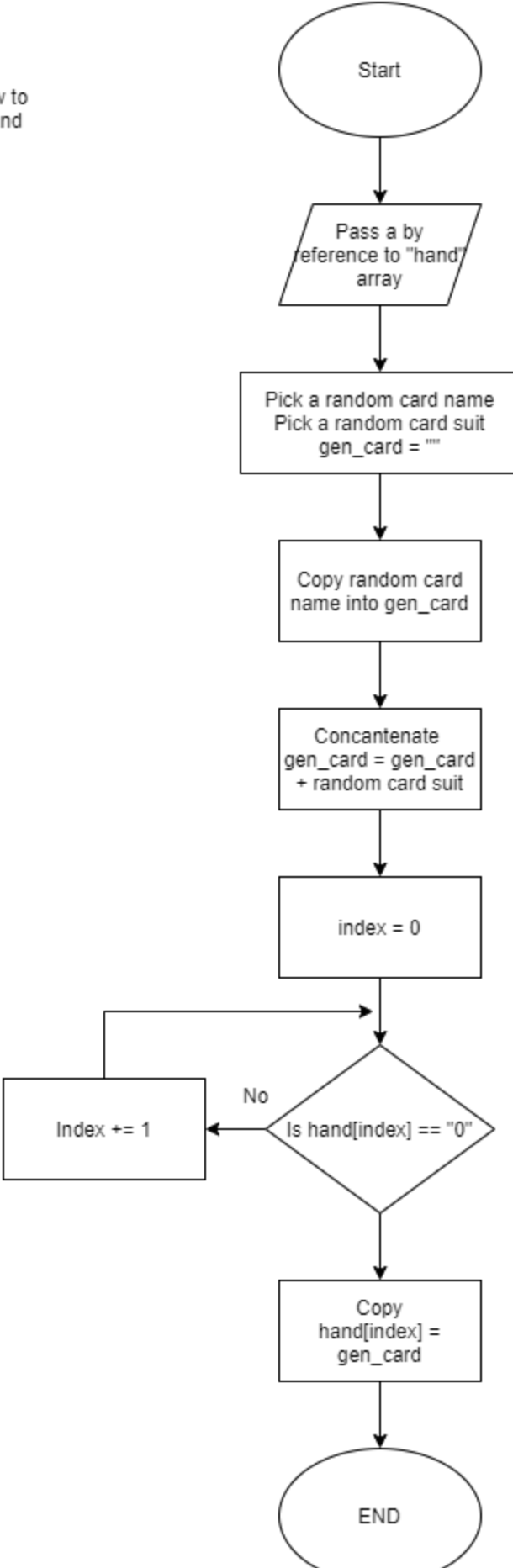
# Blackjack routine

This flowchart explains what happens if player or dealer has a blackjack



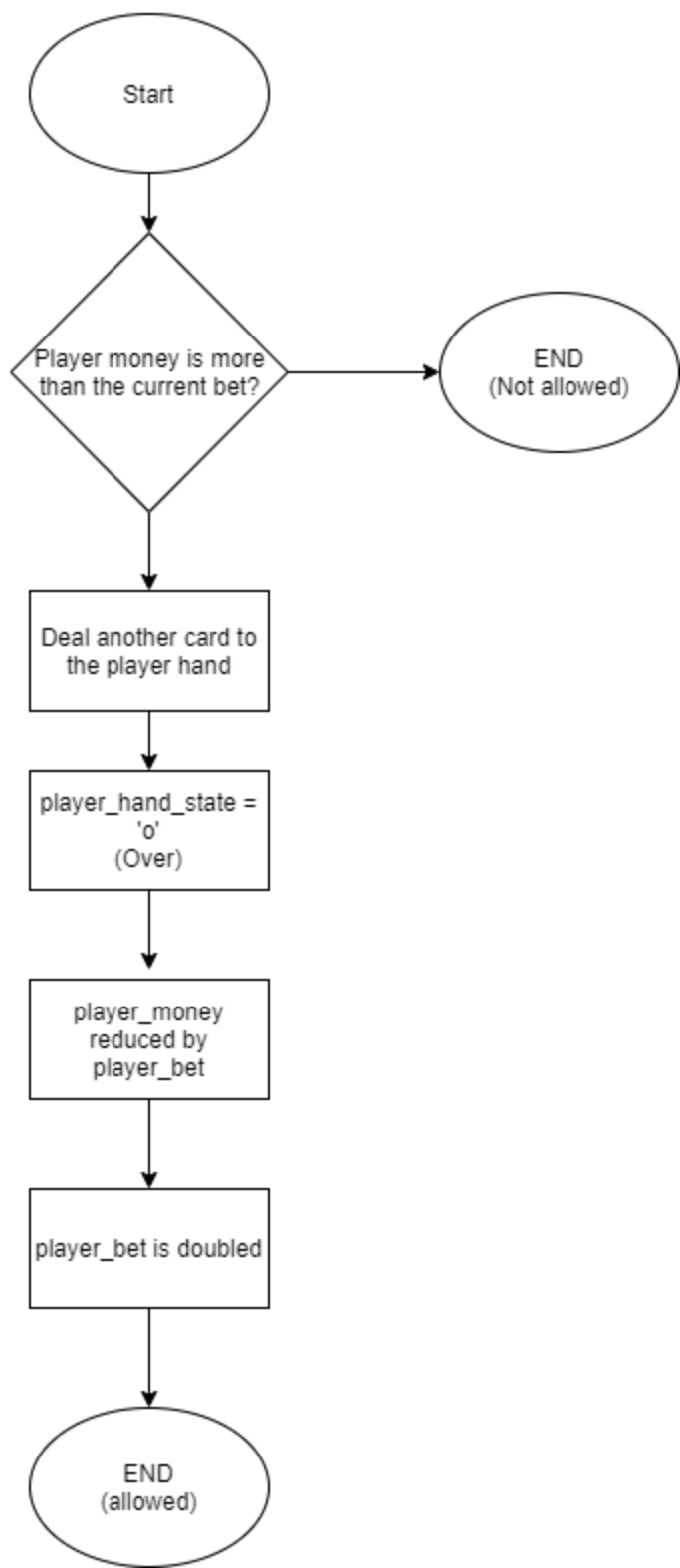
# Deal card

This flowchart explains how to deal a random card to a hand



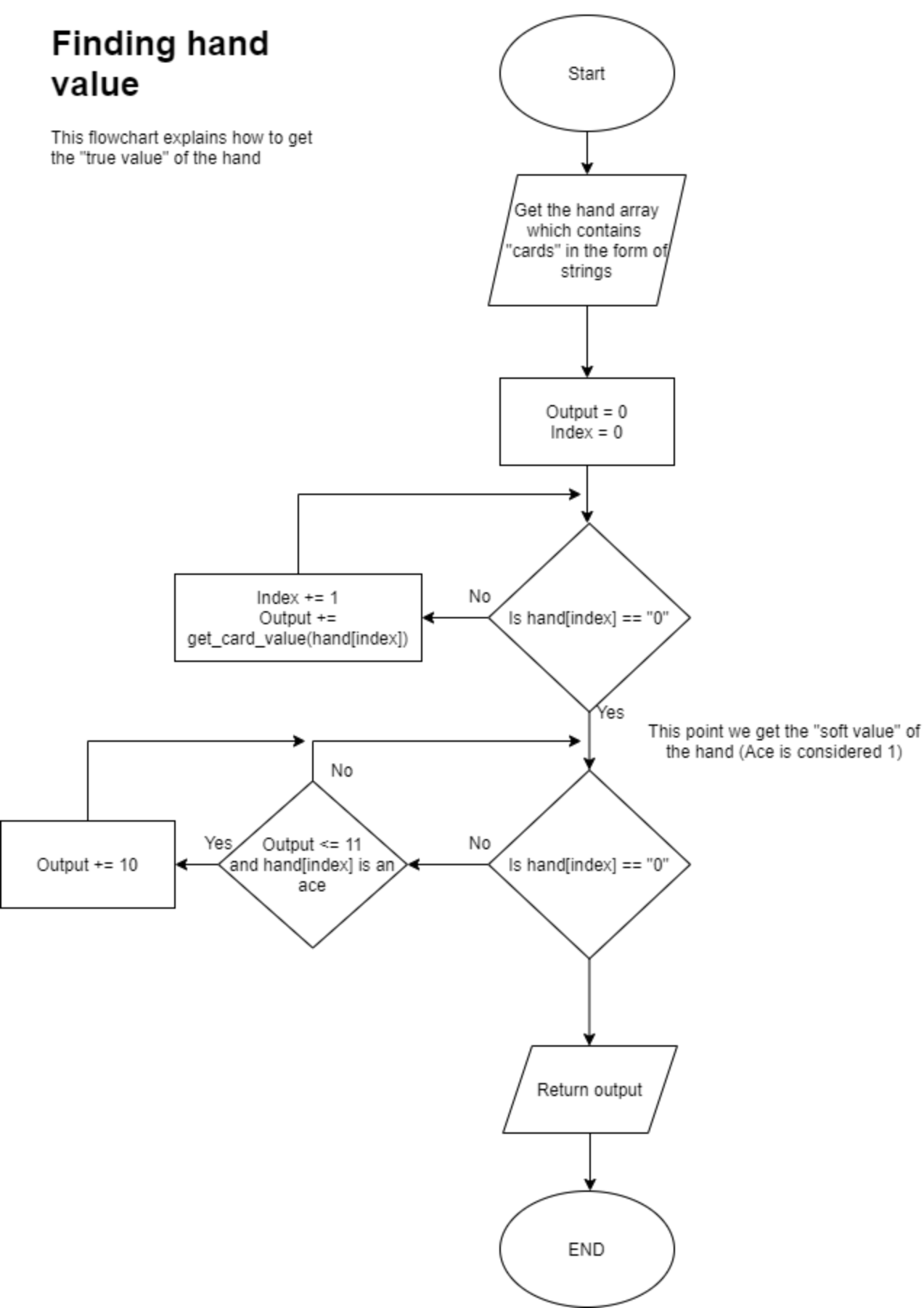
# Double down routine

This flowchart explain hwo the double down routine works



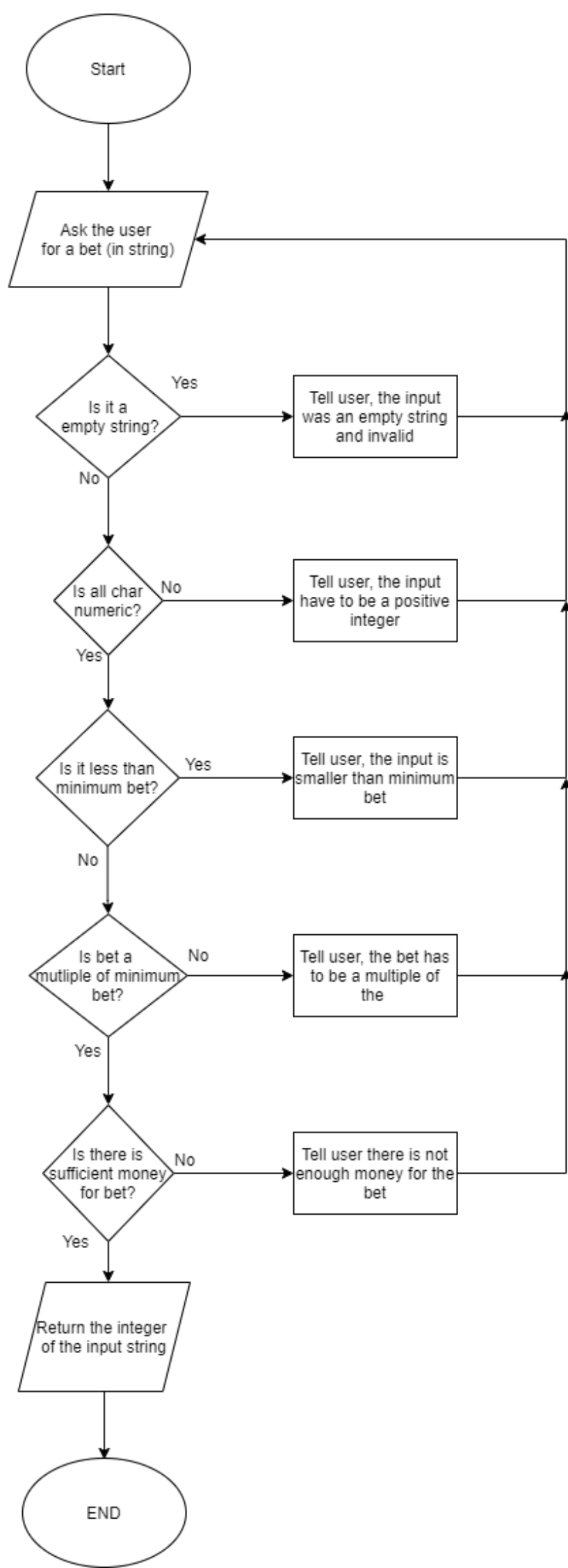
# Finding hand value

This flowchart explains how to get the "true value" of the hand



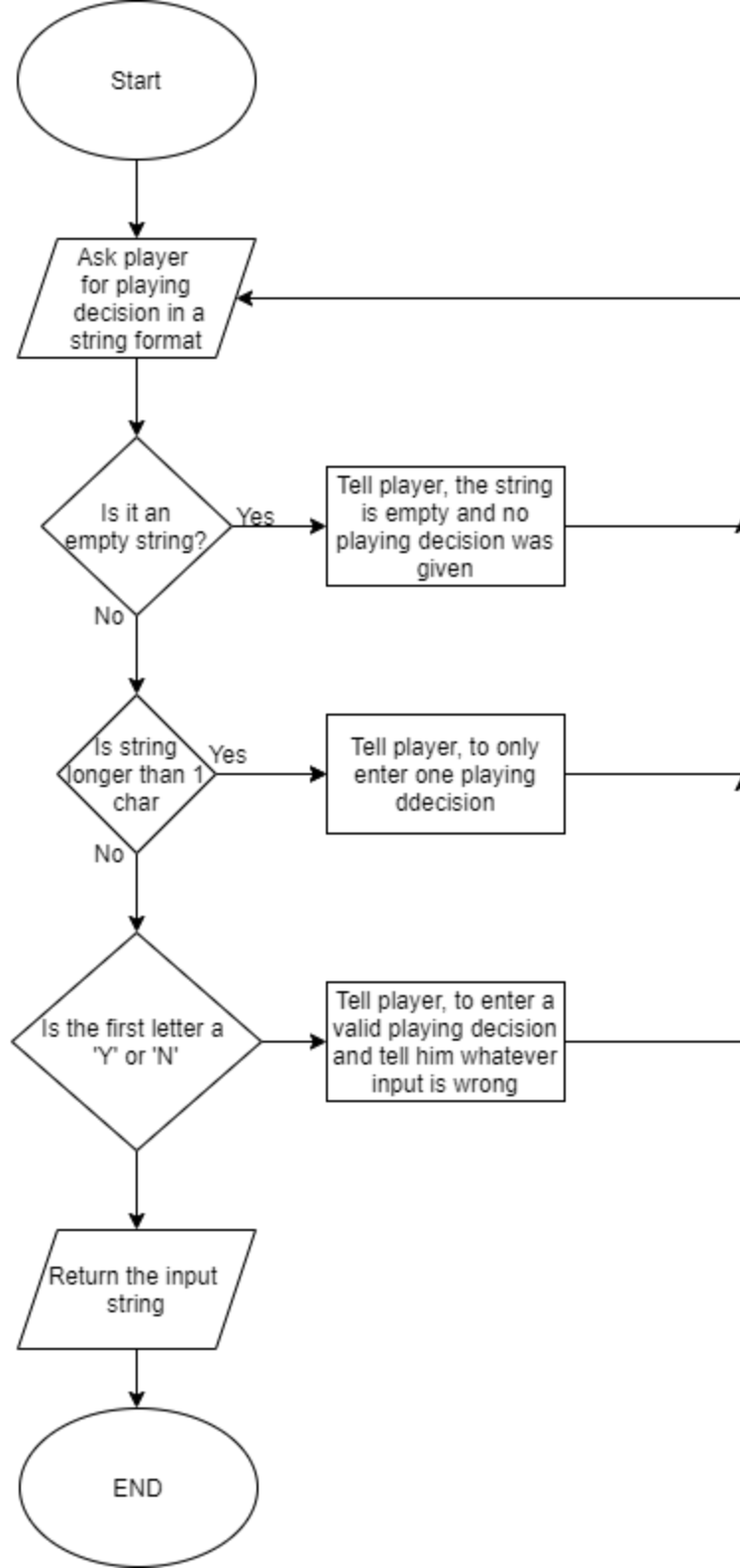
# Getting bet from user

This flowchart explains how we get a valid bet from the user



# Getting decision to keep playing

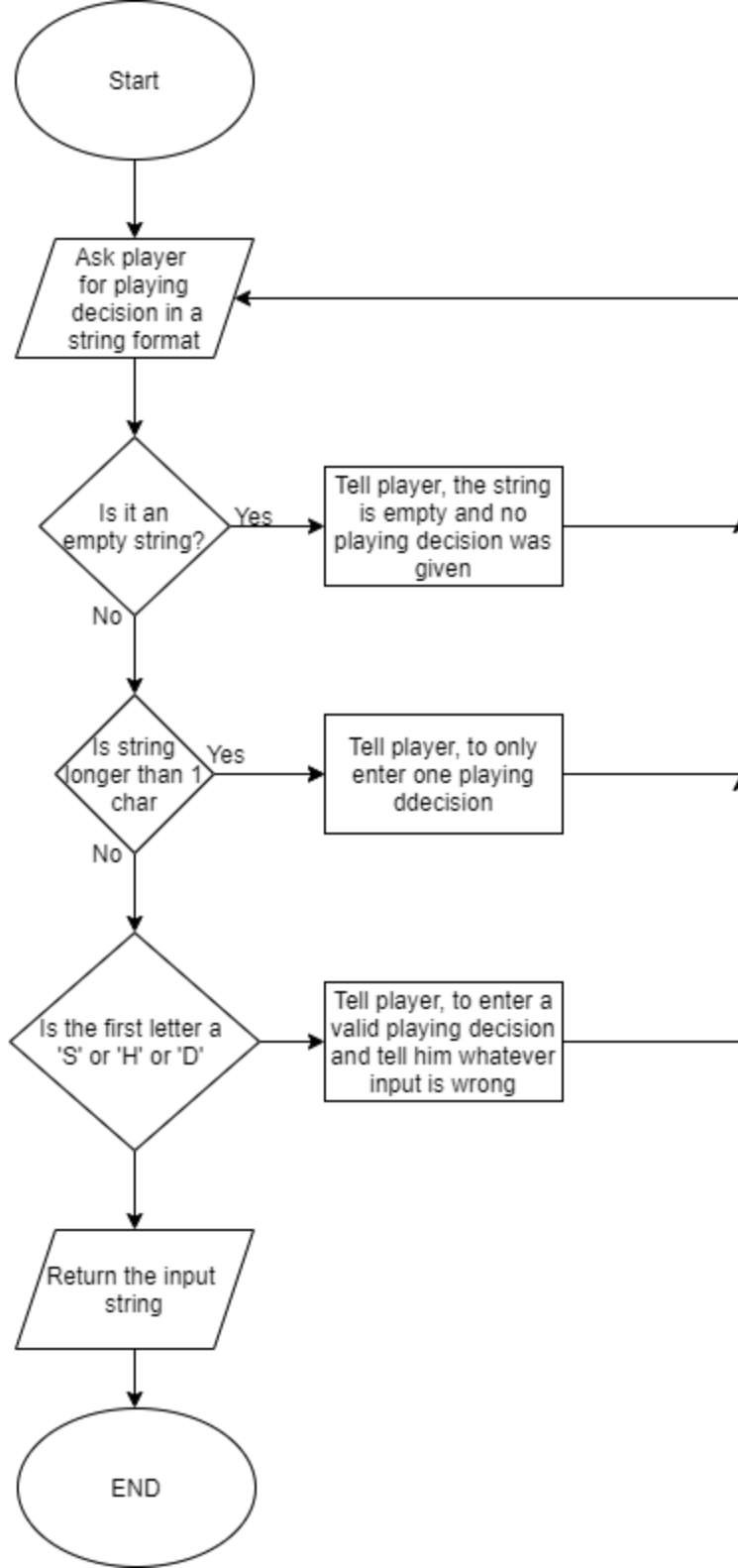
This flowchart explain how to get a valid decision by the player if she wants to keep playing





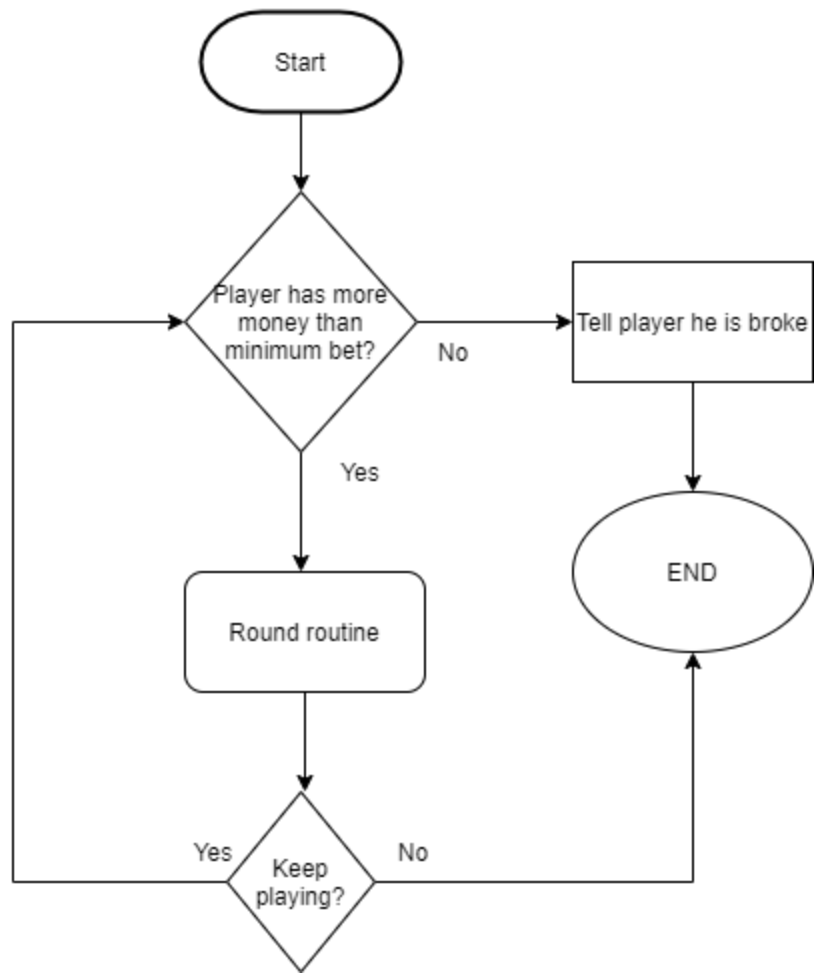
# Getting playing decision from player

This flowchart explain how to get a valid playing decision from a player



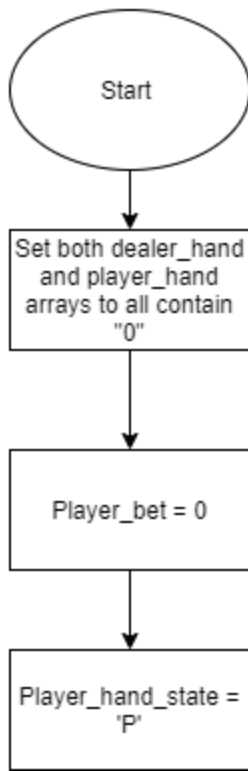
# Main game loop

This flowchart show the main game loop



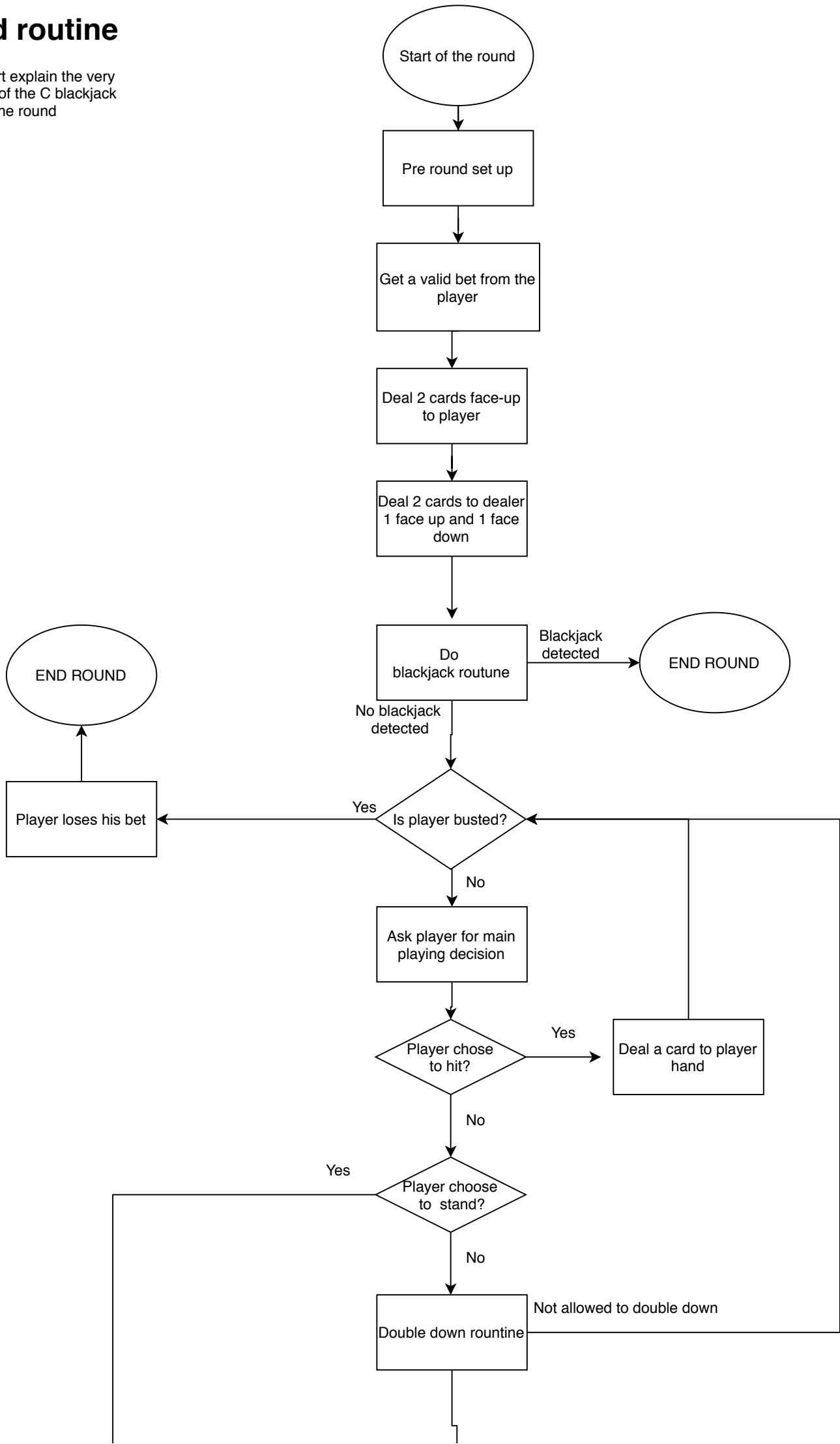
# Pre-round set up

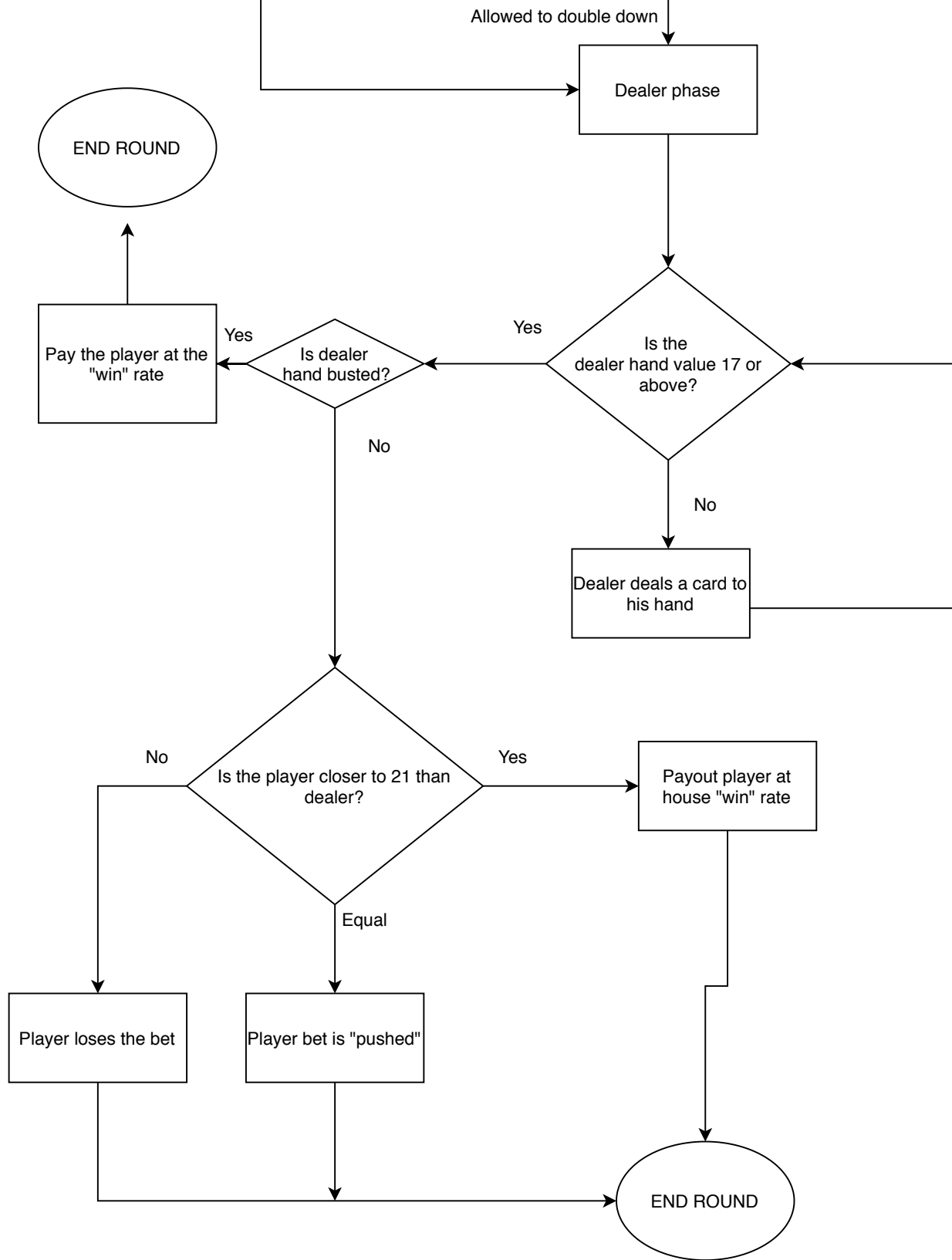
This flowchart shows how to prep for the round in C blackjack program



# Round routine

This flowchart explain the very general flow of the C blackjack program in one round





## This is the pseudocode of the program ##

# Please note that this may be incomplete of the actual program

# This is built off from the specification of the program

# Some notes concerning the game

# Blackjack(naturals) trumps 21 Ex: 6 + 7 + 8 loses to Ace + 10

# Dealer must keep dealing til he is 17 or above

## Functions for the blackjack game ##

def check\_if\_above\_21:

    Look at the hand

    Do a soft value of the hand

    If the total value is already above 21 bust the hand

    For each card in hand

        If it is an ace and soft count is <11

            Add 10 to the total

    Return the final count

def generate\_card():

    card\_name = [A,2,3,4,5,6,7,8,9,10,J,Q,K]

    card\_suit = [C, H, D, S]

    Pick a random card name

    Pick a random card suit

    Return card\_name + card suit

## Pregame set up ##

If the player has lower money than the minimal bet(10\$):

    Tell the player they are broke and shoo them off

Player walks up to the table

Clear the dealer hand

Clear the player hand

Clear the current bet of player

Player will put down some amount of bet

    If the player didn't give a number the dealer will keep asking

    IF the player gives a negative bet, the dealer will keep asking

    If the player says a number bigger than what he has, the dealer will keep asking for a valid bet

Take away that amount of bet from the player

Dealer will deal 2 cards faceup to the player

Dealer will deal 1 faceup card and 1 facedown card to himself

## Check for blackjacks ##

If the player has blackjack:

    Dealer will reveal his card

    If the dealer DON't have blackjack

        Tell the player he got a blackjack

        Pay the player according to (His bet \* House rate for blackjack)

        END OF ROUND

    Else

        Tell the player the bets are pushed

        Pay the player according to (His bet) (Since it is a pushed hand)

        END OF ROUND

If the dealer has a face up card with a value of 10 or Ace:

    The dealer check if they have blackjack

    If the dealer has blackjack:

        Dealer reveals his cards

        Tell the player he is unlucky and the dealer has blackjack

END OF ROUND

## Player main playing decision ##

## Checking for bust and ending of hand ##

While the player hand is not busted or over

Ask the player what they want to do

If they give an invalid response

Clear the response

Ask the player the give a new response

Continue

If the player choose to stand his hand:

The hand will be "over"

If the player choose to hit:

The dealer will add one more card to the hand

If the player choose to double down:

If the hand is allowed to be doubled down: # Only having 2 cards

Ask the player how much they want to add

The player will add up to an equal amount of money to the initial bet on the hand

The dealer will hit one more card to the hand

The hand is over

Else:

Tell the player they can't double down

If busted(hand):

Tell player the value of his hand



Tell player he is busted

Make the player hand state busted

Continue

If player hand is busted

END OF ROUND

### The dealer playing of hands ###

The dealer will reveal his hidden card

While his hand is not satisfied by the house condition and not busted: # Keep hitting till hard/soft 17 or 16

Dealer will hit new card to his hand

If busted(dealer hand):

The dealer hand state is busted

Break

If the dealer bust:

Tell player the dealer bust

Tell player the wins

Dealer pays the player (His bet \* 2)

END OF ROUND

Else:

If the dealer hand is closer to 21 than the player hand:

The dealer will payout that hand according to a house rate ( $\text{Bet} * \text{win rate}$ )

If the dealer hand is the same as the player hand:

The bets are pushed

If the dealer hand is farther away from 21 than the player hand:

The player loses his hands bet

END OF ROUND