

# **Project 1**

**<Blackjack>**

**CIS-5 40402**

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# Introduction

Title: Blackjack

Blackjack is the American version of a popular global banking game known as Twenty-One. It is a comparing card game between one or more players and a dealer, this project just containing one player and one dealer.

For the first round, the dealer is dealt two cards, normally one up (exposed) and one down (hidden), and two up for player. The value of cards two through ten is their pip value (2 through 10). Face cards (Jack, Queen, and King) are all worth ten. Aces can be worth one or eleven. A hand's value is the sum of the card values. Players are allowed to draw additional cards to improve their hands.

Once all the players have completed their hands, it is the dealer's turn. The dealer hand will not be completed if all players have either busted or received blackjacks. The dealer then reveals the hidden card and must hit until the cards total up to 17 points. At 17 points or higher the dealer must stay. (At most tables the dealer also hits on a "soft" 17, i.e. a hand containing an ace and one or more other cards totaling six.) You are betting that you have a better hand than the dealer. The better hand is the hand where the sum of the card values is closer to 21 without exceeding 21. The detailed outcome of the hand follows:

If the player is dealt an Ace and a ten-value card (called a "blackjack" or "natural"), and the dealer does not, the player wins and usually receives a bonus.

If the player exceeds a sum of 21 ("busts"); the player loses, even if the dealer also exceeds 21.

If the dealer exceeds 21 ("busts") and the player does not; the player wins.

If the player attains a final sum higher than the dealer and does not bust; the player wins.

If both dealer and player receive a blackjack or any other hands with the same sum, called a "push", no one wins.

## Summary

Project size: about 166 lines

The number of variables: about 13

This project includes many concepts that we learned from the chapters in the book. Also, it has many possibilities to be extended for next project. For instance, developing it to multiple players or developing banking system.

It took almost two weeks because I tried to do many debugging work for this project to check for the logic of the game, but I still found there are some tiny problems, and I would fix them for next project when I can use skills from following chapter.

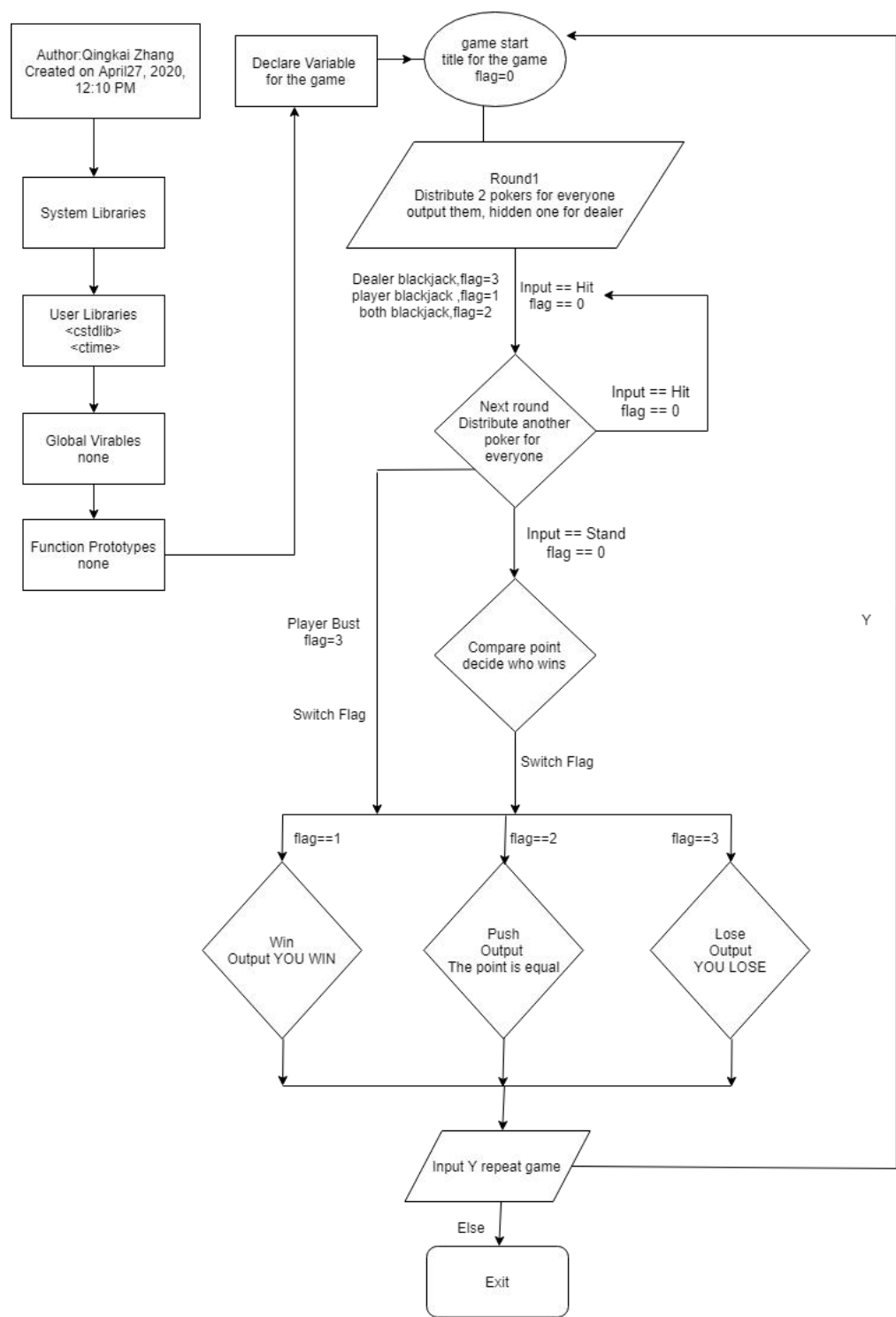
To be honest, I'm not that satisfied with this project, but it still a kind of fulfillment for myself since it is the first time for me to develop such a mini-project.

Although this is a very simple game, I think I tried to reflect every concepts we have learned like for loop, if condition, while loop, etc.

# Description

The main point that I programmed this project is the game logic. Although it is a poker game, it needs to check for the result at every round, and the situation is a little bit different from each other. I use flag to refer to the result, and switch flag to output the corresponding results. As a result, there is no need for me to output result every round.

# Flow Chart



## Pseudo Code

Initial Variables

Game Start

Generate 1-10 for Dealercard/Playercard

Calculate points

Check Blackjack and change the flag correspondingly

do

{

check Input to see Stand or Hit

If Stand, check point

Else if Hit, turn to next round

check whether the point of player is over 21

} while(flag==0)

Switch(flag)

To output the result

Game finish

If Input == 'Y'

Restart the game

Else

Exit

## Major Variables

Type	Variable Name	Description	Location
Integer	Dealercard	Pokers for the Dealer	27
	Playercard	Pokers for the Player	28
	sumD	Point for Dealer	29
	sumP	Point for Player	30
	Flag	To determine the result	35
Char	Input1	Input Y to repeat game	33
String	Input	Player chose to stand or hit	32
Bool	Status	Determine whether to repeat game	24

# Cross List

Chapter	Section	Topic	Where Line #'s	Pts	Notes
2	2	cout	58		
	3	libraries	15	8	iostream, iomanip, cmath, cstdlib, fstream, string, ctime
	4	variables/literals	29		No variables in global area, failed project!
	5	Identifiers			
	6	Integers	29	3	
	7	Characters	33	3	
	8	Strings	32	3	
	9	Floats No Doubles		3	Using doubles will fail the project, floats OK!
	10	Bools	24	4	
	11	Sizeof *****			
	12	Variables 7 characters or less			All variables <= 7 characters
	13	Scope ***** No Global Variables			
	14	Arithmetic operators			
	15	Comments 20%+	90	5	Model as pseudo code
	16	Named Constants			All Local, only Conversions/Physics/Math in Global area
	17	Programming Style ***** Emulate			Emulate style in book/in class repository
			97		
3	1	cin			
	2	Math Expression	53		
	3	Mixing data types ****			
	4	Overflow/Underflow ****			
	5	Type Casting		4	
	6	Multiple assignment *****			
	7	Formatting output		4	
	8	Strings		3	
	9	Math Library	53	4	All libraries included have to be used
	10	Hand tracing *****			
4	1	Relational Operators			
	2	if	61	4	Independent if
	4	If-else	61	4	
	5	Nesting		4	
	6	If-else-if	74	4	
	7	Flags *****	78		
	8	Logical operators		4	
	11	Validating user input		4	

	13	Conditional Operator		4	
	14	Switch	153	4	
5	1	Increment/Decrement	115	4	
	2	While	123	4	
	5	Do-while	151	4	
	6	For loop	39	4	
	11	Files input/output both		8	
	12	No breaks in loops *****			Failed Project if included
***** Not	required to	show	Total	100	

## Reference

1. textbook

## Program

```

/*
 * To change this license header, choose License Headers in Project Properties.
 * To change this template file, choose Tools | Templates
 * and open the template in the editor.
 */

/*
 * File: main.cpp
 * Author: Qingkai
 *
 * Created on 2020-04-16 15:12
 */

#include <cstdlib>
#include <ctime>
#include <iostream>
using namespace std;

/*
 *
 */

int main(int argc, char** argv) {
    bool status = true;
    while(status){
        srand(unsigned(time(0)));
    }
}

```

```

int Dealercard1,Dealercard2,Dealercard3;
int Playercard1,Playercard2,Playercard3;
int sumD=0;
int sumP=0;
int point;
string input;
char input1;

int flag = 0;

//games status, true for continue, false for finish
status=true;
for(int i=0;i<15;i++)
{
    cout<<"*";
}
cout<<" Game Start ";
for(int i=0;i<15;i++)
{
    cout<<"*";
}
cout<<endl<<endl;

//set status to true for default
status=true;
//first turn
Dealercard1=(rand()%(10))+1;
Dealercard2=(rand()%(10))+1;
Playercard1=(rand()%(10))+1;
Playercard2=(rand()%(10))+1;
//rolling the dice by getting random number
//round 1
cout<<"Dealer card1 is Dealercard1"<<endl;
cout<<"Dealer card2 is : "<<Dealercard2<<endl<<endl;
if(Dealercard1==1||Dealercard2==1)
    sumD=Dealercard1+Dealercard2+10;
else
    sumD=Dealercard1+Dealercard2;

cout<<"Player card1 is "<<Playercard1<<endl;
cout<<"Player card2 is "<<Playercard2<<endl;
if(Playercard1==1||Playercard2==1)
    sumP= Playercard1+ Playercard2+10;
else
    sumP = Playercard1+ Playercard2;
cout<<"Player POINT is "<<sumP<<endl<<endl;

if(Dealercard1==10&&Dealercard2==1){
    if(Playercard1==1&&Playercard2==10)
        flag=2;//push
    else if(Playercard2==1&&Playercard1==10)

```

```

        flag=2;//push
    else
        flag=3;//lose Dealer BlackJack
    }

    if((Playercard2==1&&Playercard1==10)||((Playercard1==1&&Playercard2==10))){
        if(Dealercard1==1&&Dealercard2==10)
            flag=2;//push
        else if(Dealercard2==1&&Dealercard1==10)
            flag=2;//push
        else
            flag=1;//Win player BlackJack
    }

    int i =3;
    do
    {
        cout<<"Input your choice : Hit or Stand"<<endl;
        cin>>input;
        if(input=="Hit"){
            Dealercard3=(rand()%(10))+1;
            Playercard3=(rand()%(10))+1;

            if(sumD<11 && Dealercard3==1)
                sumD+=Dealercard3+10;
            else
                sumD+=Dealercard3;

            if(sumP<11 && Playercard3==1)
                sumP+=Playercard3+10;
            else
                sumP+=Playercard3;

            cout<<"Dealer card"<<i<<" is : "<<Dealercard3<<endl<<endl;
            cout<<"Player card"<<i<<" is "<<Playercard3<<endl;
            cout<<"Player POINT is "<<sumP<<endl<<endl;
            i++;
            if(sumP>21 )
                flag = 3; //lose

        }

        if(input=="Stand"){
            while(sumD<=17){//Dealer would keep Hit until the point is over 17
                Dealercard3=(rand()%(10))+1;
                if(sumD<11 && Dealercard3==1)
                    sumD+=Dealercard3+10;
                else
                    sumD+=Dealercard3;
            }
        }
    }
}

```



```

        if(sumD>21)
            flag=1;
    }
    cout<<"Dealer POINT is "<<sumD<<endl;
    cout<<"Player POINT is "<<sumP<<endl<<endl;
    if(sumD<=21 && sumP<=21){
    if(sumD > sumP){
        flag = 3;//lose
    }
    else if(sumD == sumP){
        flag = 2;//push
    }
    else if(sumD < sumP){
        flag = 1;//Win
    }
    }
    else if(sumP>21)
        flag = 3;//lose
    else if(sumD>21 && sumP<=21)
        flag = 1;//win
    }

} while(flag==0);

switch(flag){
    case 1: cout<<"You Win!!"<<endl<<endl;
        break;
    case 2: cout<<"The Point is Equal!!"<<endl<<endl;
        break;
    case 3: cout<<"You Lose!!"<<endl<<endl;
        break;
}
cout<<"Input Y to repeat the Game";
cin>>input1;
if(input1!='Y')
    status = false;
}
return 0;
}

```



起始页 × main.cpp ×

源 历史记录

```
86         flag=2;//push
87     else if (Dealercard2==1&&Dealercard1==10)
88         flag=2;//push
89     else
90         flag=1;//Win player BlackJack
91 }
92
93 int i =3;
94 do
95 {
96     cout<<"Input your choice : Hit or Stand"<<endl;
97     cin>>input;
98     if(input=="Hit") {
99         Dealercard3=(rand()%10)+1;
100         Playercard3=(rand()%10)+1;
101
102         if(sumD<11 && Dealercard3==1)
103             sumD+=Dealercard3+10;
104     else
```

输出

Project 1 (运行) #3 × Project 1 (构建, 运行) × Project 1 (运行) ×

```
Player card2 is 5
Player POINT is 9

Input your choice : Hit or Stand
Stand
Dealer POINT is 19
Player POINT is 9

You Lose!!

Input Y to repeat the GameY
***** Game Start *****

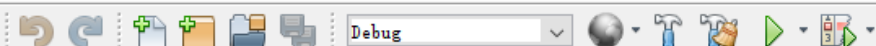
Dealer card1 is Dealercard1
Dealer card2 is : 1

Player card1 is 10
Player card2 is 1
Player POINT is 21

Input your choice : Hit or Stand
Stand
Dealer POINT is 21
Player POINT is 21

The Point is Equal!!

Input Y to repeat the Game
```



起始页 × main.cpp ×

源 历史记录

```
66     cout<<"Player card1 is "<<Playercard1<<endl;
67     cout<<"Player card2 is "<<Playercard2<<endl;
68     if(Playercard1==1||Playercard2==1)
69         sumP= Playercard1+ Playercard2+10;
70     else
71         sumP = Playercard1+ Playercard2;
72     cout<<"Player POINT is "<<sumP<<endl<<endl;
73
74     if(Dealercard1==10&&Dealercard2==1){
75         if(Playercard1==1&&Playercard2==10)
76             flag=2;//push
77         else if(Playercard2==1&&Playercard1==10)
78             flag=2;//push
79         else
80             flag=3;//lose Dealer BlackJack
81     }
82
83
```

输出

Project 1 (运行) #3 × Project 1 (构建, 运行) × Project 1 (运行) ×

Input Y to repeat the GameY  
\*\*\*\*\* Game Start \*\*\*\*\*

Dealer card1 is Dealercard1  
Dealer card2 is : 8

Player card1 is 4  
Player card2 is 5  
Player POINT is 9

Input your choice : Hit or Stand  
Hit  
Dealer card3 is : 3

Player card3 is 7  
Player POINT is 16

Input your choice : Hit or Stand  
Stand  
Dealer POINT is 21  
Player POINT is 16

You Lose!!

Input Y to repeat the GameHit

运行 SUCCESSFUL (总时间: 1m 19s)



起始页 × main.cpp ×

源 历史记录

```
66     cout<<"Player card1 is "<<Playercard1<<endl;
67     cout<<"Player card2 is "<<Playercard2<<endl;
68     if(Playercard1==1||Playercard2==1)
69         sumP= Playercard1+ Playercard2+10;
70     else
71         sumP = Playercard1+ Playercard2;
72     cout<<"Player POINT is "<<sumP<<endl<<endl;
73
74     if(Dealercard1==10&&Dealercard2==1){
75         if(Playercard1==1&&Playercard2==10)
76             flag=2;//push
77         else if(Playercard2==1&&Playercard1==10)
78             flag=2;//push
79         else
80             flag=3;//lose Dealer BlackJack
81     }
82
83
```

输出

Project 1 (构建, 运行) #2 × Project 1 (构建, 运行) #3 × ×

\*\*\*\*\* Game Start \*\*\*\*\*

Dealer card1 is Dealercard1  
Dealer card2 is : 5

Player card1 is 3  
Player card2 is 8  
Player POINT is 11

Input your choice : Hit or Stand  
Hit  
Dealer card3 is : 4

Player card3 is 8  
Player POINT is 19

Input your choice : Hit or Stand  
Stand  
Dealer POINT is 25  
Player POINT is 19

You Win!!

Input Y to repeat the Game