



Sarah Carter  
CS 301

# Program Background & Goal



Calvinball is a fictional game created in the Calvin and Hobbes comic strip; the only rules of the game are that you can't play it the same way twice, and you don't question the masks that players wear.

A major challenge of this program is produced by the lack of set rules and actions, or even a definitive explanation of the game. The comic strip itself seems to have only featured Calvinball a few times, so my references are a bit limited.

My approach so far is building assembly files that hold game directions ("Hit *this* through wickets with a cricket bat") where *this* is defined in an alternate assembly file holding equipment (e.g. badminton birdie, soccer ball, pinecones).

# Assembly Files

## Rules.s

Contains a simple array of pointers to data quadword directions. The game source code passes a randomly generated number to the file to call one of the defined directions.

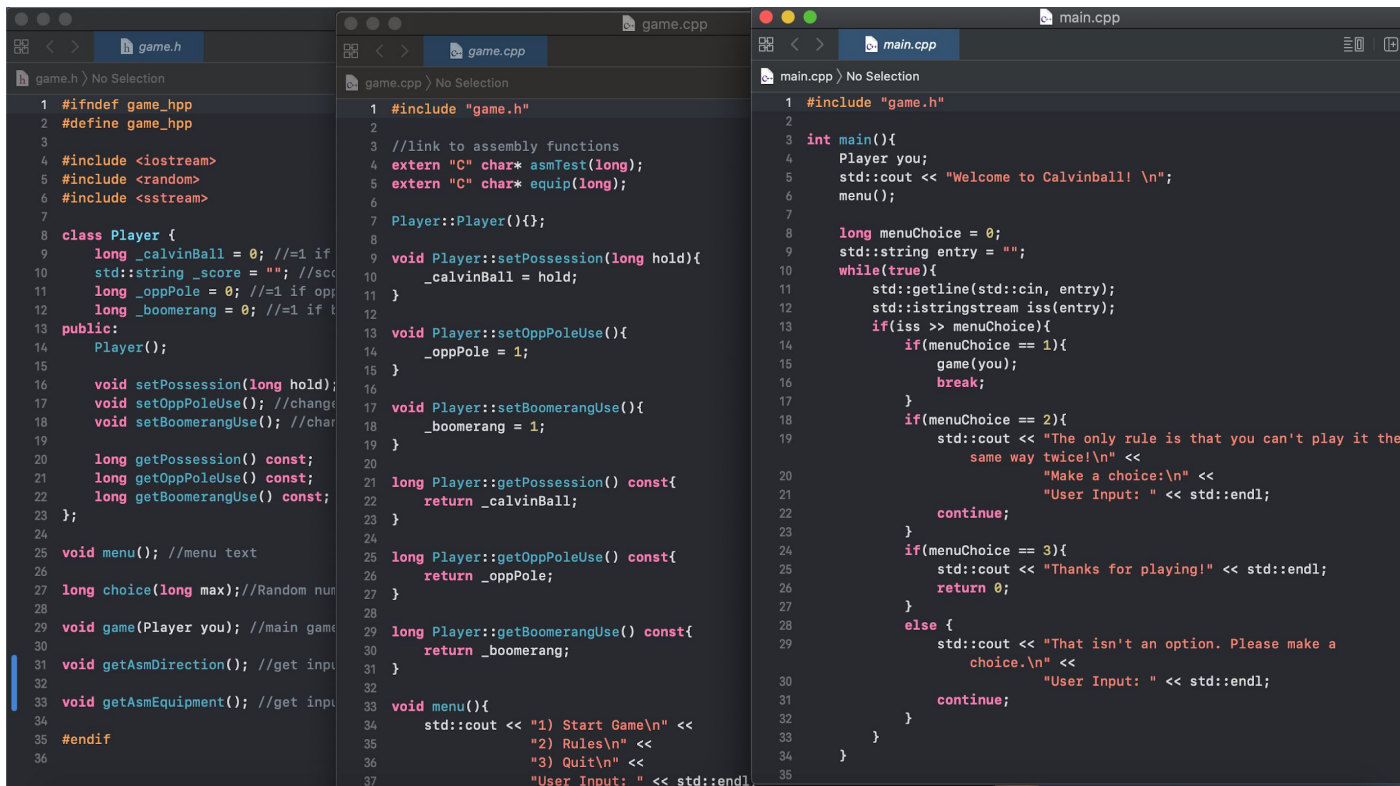
## Equipment.s

Contains a simple array of pointers to data quadword equipment. The game source code passes a randomly generated number to call for an item.

```
rules.s > No Selection
1  section .text
2  global _asmTest
3
4  _asmTest:
5      mov rcx, rdi
6      lea rdx, [rel _daRulz]
7
8      mov rax, [rdx + 8*rcx]
9
10     ret
11
12     _daRulz:
13         dq _rule1
14         dq _rule2
15         dq _rule3
16         dq _rule4
17
18     _rule1:
19         db 'Hit this through a wicket with a cricket bat'
20
21     _rule2:
22         db 'Throw this into a bucket.\0'
23
24     _rule3:
25         db 'Knock this into the Master Tree using a cricket bat'
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27     _rule4:
28         db 'Bounce this on a tennis racket while jumping'
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```

# C++ Files

The interactive portion of the program is contained in main.cpp and game.cpp. The class Player and function declarations are contained in the game.h header file.



```
game.h
1 #ifndef game_hpp
2 #define game_hpp
3
4 #include <iostream>
5 #include <random>
6 #include <sstream>
7
8 class Player {
9     long _calvinBall = 0; //1 if f
10     std::string _score = ""; //sc
11     long _oppPole = 0; //1 if opp
12     long _boomerang = 0; //1 if b
13 public:
14     Player();
15
16     void setPossession(long hold);
17     void setOppPoleUse(); //change
18     void setBoomerangUse(); //cha
19
20     long getPossession() const;
21     long getOppPoleUse() const;
22     long getBoomerangUse() const;
23 };
24
25 void menu(); //menu text
26
27 long choice(long max); //Random num
28
29 void game(Player you); //main game
30
31 void getAsmDirection(); //get input
32
33 void getAsmEquipment(); //get input
34
35 #endif
36
```

```
game.cpp
1 #include "game.h"
2
3 //link to assembly functions
4 extern "C" char* asmTest(long);
5 extern "C" char* equip(long);
6
7 Player::Player(){};
8
9 void Player::setPossession(long hold){
10     _calvinBall = hold;
11 }
12
13 void Player::setOppPoleUse(){
14     _oppPole = 1;
15 }
16
17 void Player::setBoomerangUse(){
18     _boomerang = 1;
19 }
20
21 long Player::getPossession() const{
22     return _calvinBall;
23 }
24
25 long Player::getOppPoleUse() const{
26     return _oppPole;
27 }
28
29 long Player::getBoomerangUse() const{
30     return _boomerang;
31 }
32
33 void menu(){
34     std::cout << "1) Start Game\n" <<
35     "2) Rules\n" <<
36     "3) Quit\n" <<
37     "User Input: " << std::endl;
38 }
39
```

```
main.cpp
1 #include "game.h"
2
3 int main(){
4     Player you;
5     std::cout << "Welcome to Calvinball! \n";
6     menu();
7
8     long menuChoice = 0;
9     std::string entry = "";
10    while(true){
11        std::getline(std::cin, entry);
12        std::istringstream iss(entry);
13        if(iss >> menuChoice){
14            if(menuChoice == 1){
15                game(you);
16                break;
17            }
18            if(menuChoice == 2){
19                std::cout << "The only rule is that you can't play it the
20                same way twice!\n" <<
21                "Make a choice:\n" <<
22                "User Input: " << std::endl;
23                continue;
24            }
25            if(menuChoice == 3){
26                std::cout << "Thanks for playing!" << std::endl;
27                return 0;
28            }
29            else {
30                std::cout << "That isn't an option. Please make a
31                choice.\n" <<
32                "User Input: " << std::endl;
33                continue;
34            }
35        }
36    }
37 }
```

# Conclusion, Comments, Complications

- The player is given choices of actions to take - right now it is numeric selection. I may change it to text input from the player.
- Ultimately I would like to add conditional opportunities, like entering one of the game zones or acquiring the Calvinball
- The use of two assembly files is causing repeated segmentation faults - the program will run, but at some point, it will throw a seg fault.
  - Conundrum: admit defeat and use only one assembly file, replacing the other with a vector? Or persist in attempting to debug, thus using up time that could be spent making more interesting, dynamic code?

