# Project 2
# NBA ALL-STARS

Created By: Ryan DeLeon
February 1, 2016
Dr. Mark Lehr
CSC 5- C++

# Introduction

Instead of coding one of my favorite games that has already been made, I have created my own original game centered around my favorite sport. The title of my game is NBA All-Stars  and the premise of the game is to allow the player to play in a one on one pickup up game against  their choice of four of the best basketball players in the world. The first player to score three points wins. Along with the choice of the opponent, the user also get to choose the arena where the game will take place. The game consists of a maximum of five possessions in which either the user or the opponent will score a point. Each possession is like its own mini game, the player is given a set of instructions on how to score and if the player fails, then the opponent scores. I attempted to make each possession different in order to keep the user engaged throughout the entire game. The results of the game including the player's name, the opponent, the location, and whether they won or loss will be output to a file in the project folder.

Here is a quick breakdown of how each possession goes.

<u>First</u> - Player chooses left or right in order to force the opponent a specific way

<u>Second</u> - A timed possession where the user has 5 seconds to input a character

<u>Third</u> - Another guess by the user, this time the correct answer is generated randomly

<u>Fourth</u> - User must select a location on a simulated basketball court

<u>Fifth</u> - Trivia question involving all of the possible opponents

| Variables | | |
|---|---|---|
| **Variable Name** | **Data Type** | **Purpose** |
| player | string | The users name |
| opponent | string | The opponents name |
| crtName | string | The name of the court |
| selOp | unsigned short | Users number input for opponent selection |
| court | unsigned short | Users number input for opponent selection |
| guesTyp | unsigned short | Users choice of shot type |
| ranTyp | unsigned short | Random shot ype |
| selFor | unsigned character | Users choice of shot type |
| ready | unsigned character | Getting the user ready for next possession |
| shoot | unsigned character | User input to shoot |
| plyAgn | unsigned character | User input to play again or not |
| force | boolean | Dtermines ifuser chose left or right |
| ppts | unsigned short | Players total points |
| oppts | unsigned short | Opponents total points |
| begTime | unsigned integer | Beginning time for timed possession |

| endTime | unsigned integer | Ending time for timed possession |
|---------|------------------|----------------------------------|
| totTime | unsigned integer | Total time for timed possession |
| reDsply | boolean | Determines whether to replay game |
| SIZE | constant integer | Sets the size of the location array |
| crt[] | integer array | Holds the choices for the shot locations |
| loc | short | User's location selection (fourth poss) |
| row | integer | Sets number of rows for the name array |
| col | integer | Sets number of columns for the name array |
| names[] | string array | Holds the names of the opponents (fifth) |
| name | string | Users inputs to fill in names array |

# Constructs & Concepts

| Construct/Concept | Purpose | Location |
|---|---|---|
| switch | Getting the name of the court | Line 103 |
| while | Used for quick spacing | Line 201 |
| do-while | Used to redisplay the entire game | Line 67 |
| if-else | Get opponents name | Line 74 |
| ternary operator | Used to output a win or lose statement | Line 158 |
| for loop | Mostly used for quick spacing | Line 160 |
| writing to a file | Writes the game results to a file | Line 401 |
| function with no return | Used to fill and print the court | Line 423 |
| function with return | Use a bool to return a true or false | Line 454 |
| one dimensional array | Stores the possible shot locations | Line 326 |
| two dimensional array | Stores the players names | Line 358 |
| pass by value | Pass integers into a void function | Line 445 |
| pass by reference | Pass players names that are inputted | Line 365 |
| pass array between function | Pass the court betwween void functions | Line 423 |

# Pseudocode

*Display Header*

*Declare Variables*

*Open File to store game results*

*Welcome user*

*Ask to  enter the users name*

*read in as string*

*Ask to select opponent*

*read in as short*

*Set name of opponent equal to string using if else*

> *if number inputted equals 1 set opponent equal to Lebron James*

> *else if number inputted equals 2 set opponent equal to Lebron James*

> *else if number inputted equals 3 set opponent equal to Kobe Bryant*

> *else if number inputted equals 4 set opponent equal to James Harden*

*Do this while the user does not enter a valid input*

*Ask to select arena*

*Use switch to set court equal to a string*

> *Case 1 is staples center*

> *Case 2 is Madison Square Garden*

> *Case 3 is Pauley Pavilion*

> *Case 4 is Rucker Park*

*Start game*

*First Possession*

*Instruct user to force player left or right*

*If user chose steph curry the player loses and opponent score*

*else if user chose kobe bryant or lebron james*

    *Use ternary operator to display the user won if the user chose left and add a point*

    *or display a loss if the user chose right and add a point to opponent*

*else if user chose James Harden*

    *Use ternary operator to display the user won if the user chose right and add a point*

    *or display a loss if the user chose left and add a point to opponent*


*Second Possession*

    *Give player instructions for this possession*

    *Ask to input character when ready*

    *Ask to quickly press 's' to shoot*

    *begin timer before input and end after input*

    *if the total time it took is longer than 5 seconds display loss message and add point to*

    *opponent*

    *else display win message and add point to player*

*Third Possession*

    *Display final possession instructions*

    *Ask user to input what type of shot they predict opponent to take*

    *read in as int*

    *generate a random number using rand%3*

    *do this while the random number equals a 1*

    *if random number and player guess are equal display win message and add point to*

    *user*

else add point to opponent and display loose message

*Fourth Possession*

*if neither player has 3 points then go on*

> *Give instructions for the possession*
>
> *Call function to fill the court array*
>
> *Call function to print the court array*
>
> *Ask for users guess of the location*
>
> *if the guess matches the location set for the opponent they chose then display win*
>
> > *message and add point to player score*
>
> *else display lose message and add point to opponents score*

*Fifth Possession*

*if the score is tied then continue*

> *Display instructions for the possession*
>
> *fill the first column of the names array*
>
> *ask user to input the names in the correct order*
>
> *fill the second column of the names array with users inputs*
>
> *check to see if the columns match*
>
> *if yes then display win message and add point to player*
>
> *else then display lose message and add point to opponent*

*if the player has 3 points then tell them they won the game*

*else if the opponent has 3 points they lost the game*

*close the file*

*ask to play again*

*if yes, restart the game*

*else end program*

# Source Code

```cpp
/*
 * File:   main.cpp
 * Author: Ryan DeLeon
 * Created on February , 11, 12:38 AM
 */

//User Libraries
#include <cstdlib>
#include <iostream>
#include <string>
#include <ctime>
#include <fstream>
#include <iomanip>
using namespace std;

//System Libraries
//Global Constants
//Function Prototypes
void fillCrt(int [], int);
void prntCrt(int [], int);
bool assgnLoc (int [], short, short);
//Execution Begins Here

int main(){

  //Redisplay
  bool reDsply=true;
  do{

 //Header
  cout<<endl;
  cout<<"**************************************************************"<<endl;
  cout<<"**              NBA ALL STARS                  **"<<endl;
  cout<<"**           Created By:  Ryan DeLeon           **"<<endl;
  cout<<"**************************************************************"<<endl;

 //Set random seed
  srand(static_cast<unsigned int>(time(0)));
```

```cpp
//Declare Variables
    string player, oponent, crtNam;
    unsigned int selOp, court, guesTyp, ranTyp;
    unsigned char selFor, ready, shoot, plyAgn;
    bool force=true;
    unsigned short ppts=0, opts=0; //Players and opponents points
    unsigned int begTime, endTime, totTime=5, n=0;
    const int SIZE=6;
    int crt[SIZE];
    short loc;
    int col=2;
    int row=4;
    string names[row][col];
    string name;

//Open a file for game summary
    ofstream out;
    out.open("Game Summary.dat");

//Player input
    cout<<"WELCOME TO NBA ALLSTARS"<<endl;
    cout<<"Please enter the name of your player. (First name only please)"<<endl;
    cin>>player;

//Picking opponent
    cout<<endl<<"Cool, so you're "<<player<<". "<<endl;
    cout<<"Which NBA ALL-STAR would you like to go up against?"<<endl;
    do{
    cout<<"Enter the number of the opponent you choose."<<endl;
    cout<<"1. Lebron James"<<endl;
    cout<<"2. Kobe Bryant"<<endl;
    cout<<"3. Steph curry"<<endl;
    cout<<"4. James Harden"<<endl<<endl;
    cin>>selOp;
    if(selOp==1){
        cout<<endl<<"You chose to face the King, Good Luck."<<endl<<endl;
        oponent="Lebron";
    }
    else if(selOp==2){
        cout<<endl<<"They dont call Kobe the Black Mamba for nothing, Good
Luck!"<<endl<<endl;
        oponent="Kobe";
```

```cpp
    }
    else if(selOp==3){
        cout<<endl<<"Dont let the babyface fool you, Steph is an assasin, Good
Luck!."<<endl<<endl;
        oponent="Steph";
    }
    else if(selOp==4){
        cout<<endl<<"Fear the beard, Good Luck!"<<endl<<endl;
        oponent="James";
    }
    else if(selOp<1 || selOp>4){
        cout<<"Sorry, I know you're scared but you gotta pick one"<<endl<<endl;
    }
    }while (selOp<1 || selOp>4);

//Selecting arena
    cout<<"One last thing, pick the arena you would like to play in."<<endl;
    cout<<"1. Staples Center"<<endl;
    cout<<"2. Madison Square Garden"<<endl;
    cout<<"3. Pauley Pavilion"<<endl;
    cout<<"4. Rucker Park"<<endl;
    cout<<"Enter the number next to the court you want."<<endl<<endl;
    cin>>court;
    switch(court){
        case 1:{
            cout<<endl<<"Welcome to Staples Center. Home of the LA Lakers."<<endl;
            crtNam="Staples Center";
            break;
        }
        case 2:{
            cout<<endl<<"Welcome to Madison Square Garden. Home of the NY Knicks."<<endl;
            crtNam="Madison Square Garden";
            break;
        }
        case 3:{
            cout<<endl<<"Welcome to Pauley Pavilion. Home of the UCLA Bruins."<<endl;
            crtNam="Pauley Pavilion";
            break;
        }
        case 4:{
            cout<<endl<<"Welcome to Rucker Park. Streetball Central."<<endl;
            crtNam="Rucker Park";
            break;
```

```
        }
        default:{
            cout<<"Please select a court."<<endl;
            break;
        }
    }
    cout<<endl<<endl;
    cout<<"Ok now lets start the game. First player to score 2 points wins."<<endl;
    cout<<"Each possession will have a different set of instructions and you"<<endl
        <<"may need to react quickly so pay attention. BEGIN!"<<endl<<endl;

 //First posession
    cout<<"First Possession."<<endl<<endl;
    cout<<"You check the ball to "<<oponent<<". Now since you're on defense"<<endl
        <<"you have to force him to his off hand."<<endl;
    cout<<"Enter 'L' to force "<<oponent<<" left. Or 'R' to force him right"<<endl;
    cin>>selFor;
    selFor=toupper(selFor);

    //Using ternary operator / And "For loop" for quick spacing
    if (selFor=='L')
        force=false;
    if (oponent=="Steph"){
        cout<<endl<<"Sorry, unfortunately you chose to play the best ball handler"<<endl
            <<"in the world so he has no off hand. You got crossed up and scored on. Your
ball"<<endl;
        opts++;
        cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        for(unsigned short i=0;i<=5;i++){
            cout<<endl;
        }
    }else if (oponent=="Kobe"){
        if (selFor=='R')
            opts++;
        else ppts++;
        cout<<(force?"Wrong move, Kobe is right handed and you get dunked on. Your ball":
            "Nice move, forcing him left caused a turnover and an easy lay up for you. Your
ball")<<endl;
        cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        for(unsigned short i=0;i<=5;i++){
            cout<<endl;
        }
    }else if (oponent=="Lebron"){
```

```cpp
        if (selFor=='R')
            opts++;
        else ppts++;
        cout<<(force?"Wrong move, Lebron is right handed and you get dunked on. Your ball":
            "Nice move, forcing him left caused a turnover and an easy lay up for you. Your
ball")<<endl;
        cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        for(unsigned short i=0;i<=5;i++){
            cout<<endl;
        }
    }else if (oponent=="James"){
        if (selFor=='L')
            opts++;
        else ppts++;
        cout<<(!force?"Wrong move, James is left handed and you get dunked on":
            "Nice move, forcing him right caused a turnover and an easy lay up for you. Your
ball")<<endl;
        cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        for(unsigned short i=0;i<=5;i++){
            cout<<endl;
        }
    }

    //Second Possession, use while loop for quick spacing this time
    cout<<"Second Possession."<<endl<<endl;
    cout<<"Ok now its your turn to show what you got. This possession requires"<<endl
        <<"some quick reflexes so enter any character when ready."<<endl<<endl;
    cin>>ready;
    if (oponent=="Steph"){
        begTime=static_cast<unsigned int>(time(0));
        cout<<endl<<"You were able to back down the smaller Curry, "<<endl
            <<"quick, press 'S' to shoot."<<endl;
        cin>>shoot;
        endTime=static_cast<unsigned int>(time(0));
        if (totTime<=endTime-begTime){
            opts++;
            cout<<endl<<"You were to slow and the shot got blocked, causing an easy"<<endl
                <<"bucket for "<<oponent<<"."<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
            while(n<5){
                cout<<endl;
                n++;
            }
```

```cpp
        }else if(totTime>endTime-begTime) {
            ppts++;
            cout<<endl<<"Awesome! Your quick reactions paid off. Swish!"<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
            while(n<5){
                cout<<endl;
                n++;
            }
        }
    }else if (oponent=="Kobe"){
        begTime=static_cast<unsigned int>(time(0));
        cout<<endl<<"You were able to create space against the much older Bryant, "<<endl
            <<"quick, press 'S' to shoot."<<endl;
        cin>>shoot;
        endTime=static_cast<unsigned int>(time(0));
        if (totTime<=endTime-begTime){
            opts++;
            cout<<endl<<"You were to slow and the shot got blocked, causing an easy"<<endl
                <<"bucket for "<<oponent<<"."<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
            while(n<5){
                cout<<endl;
                n++;
            }
        }else if(totTime>endTime-begTime) {
            ppts++;
            cout<<endl<<"Awesome! Your quick reactions paid off. Swish!"<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
            while(n<5){
                cout<<endl;
                n++;
            }
        }
    }else if (oponent=="Lebron"){
        begTime=static_cast<unsigned int>(time(0));
        cout<<endl<<"You were able to run away form the slow giant Lebron, "<<endl
            <<"quick, press 'S' to shoot."<<endl;
        cin>>shoot;
        endTime=static_cast<unsigned int>(time(0));
        if (totTime<=endTime-begTime){
            opts++;
            cout<<endl<<"You were to slow and the shot got blocked, causing an easy"<<endl
                <<"bucket for "<<oponent<<"."<<endl;
```

```cpp
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
             while(n<5){
                cout<<endl;
                n++;
             }
        }else if(totTime>endTime-begTime) {
            ppts++;
            cout<<endl<<"Awesome! Your quick reactions paid off. Swish!"<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
             while(n<5){
                cout<<endl;
                n++;
             }
        }
    }else if (oponent=="James"){
        begTime=static_cast<unsigned int>(time(0));
        cout<<"You were able to grab James' Beard and distract him., "<<endl
            <<"quick, press 'S' to shoot."<<endl;
        cin>>shoot;
        endTime=static_cast<unsigned int>(time(0));
        if (totTime<=endTime-begTime){
            opts++;
            cout<<endl<<"You were to slow and the shot got blocked, causing an easy"<<endl
                <<"bucket for "<<oponent<<"."<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
             while(n<5){
                cout<<endl;
                n++;
             }
        }else if(totTime>endTime-begTime) {
            ppts++;
            cout<<endl<<"Awesome! Your quick reactions paid off. Swish!"<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
             while(n<5){
                cout<<endl;
                n++;
             }
        }
    }
//Third Possession
cout<<"Third Possession."<<endl<<endl;
cout<<"For this possession you have to guess what type of shot"<<endl
    <<"you think "<<oponent<<" is going to take."<<endl;
```

```cpp
        cout<<"Enter 2 if you think he will take a two pointer."<<endl;
        cout<<"Enter 3 if you think he will take a three pointer."<<endl;
        cin>>guesTyp;
        //Randomly generate a 2 or 3
        do{
        ranTyp=rand()%3+1;
        }while(ranTyp==1);
        if (guesTyp==ranTyp){
            ppts++;
            cout<<endl<<"You guessed right and blocked the shot! Then scored a Basket!"<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        }else if (guesTyp==2 && ranTyp==3){
            opts++;
            cout<<endl<<"Oh No! You guessed wrong and started backing up expecting a
drive"<<endl;
            cout<<"but "<<oponent<<" shot it from outside and scored."<<endl<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        }else if (guesTyp==3 && ranTyp==2){
            opts++;
            cout<<endl<<"Oh No! You guessed wrong and jumped expecting a shot"<<endl;
            cout<<"but "<<oponent<<" pump faked and scored an easy layup."<<endl<<endl;
            cout<<"The score is "<<ppts<<" - "<<opts<<endl;
        }


        //Fourth possession
         for(unsigned short i=0;i<=5;i++){
             cout<<endl;
         }
        if (ppts==2 || opts==2){
            cout<<"Fourth possession."<<endl;
            cout<<"For this posession you have to choose which spot you think "
                <<oponent<<" will shoot from on the court. Good Luck!"<<endl;
            cout<<endl;

            //fill array
            fillCrt(crt,SIZE);
            //print the court
            prntCrt(crt,SIZE);

            //Get players guess
            cout<<"Where do you think "<<oponent<<" will shoot from?"<<endl;
            cin>>loc;
```

```cpp
    if (assgnLoc(crt, selOp, loc)){
    cout<<endl<<"You chose correctly and beat him to the spot! You scored!"<<endl;
    ppts++;
    }
    else {
       cout<<endl<<"Sorry you ran to the wrong spot..."<<endl;
       opts++;
    }
    cout<<"The score is "<<ppts<<" - "<<opts<<endl;
}

//Fifth possession
 for(unsigned short i=0;i<=5;i++){
       cout<<endl;
    }
if(ppts==opts){
cout<<"Final Posession. Next Score wins."<<endl;
cout<<"This last round is a little different so read carefully."<<endl;
cout<<"To score this last point you must list the playable opponents "
       <<"in order of youngest to oldest."<<endl;
cout<<"Be sure to press enter once you've finished typing each person."<<endl;
cout<<"Also, make sure to capitalize the first letter of each name...Proper english."<<endl;

//Filling first column
names[0][0]="Steph";
names[1][0]="James";
names[2][0]="Lebron";
names[3][0]="Kobe";
cout<<endl<<"Enter the players name in order of youngest to oldest."<<endl<<endl;

//Filling second column
for(int i=0; i<row; i++){
   cin>>name;//Loop for the rows
   names[i][1] = name;  //odds second column
}
//label columns
cout<<"Correct Order    Your order"<<endl<<endl;
for(int i=0; i<row; i++){
    for(int j=0; j<col; j++) cout<<names[i][j]  <<"     ";
    cout << endl;
}
```

```cpp
    //check the columns
    if(names[0][0]==names[0][1] && names[1][0]==names[1][1] &&
      names[2][0]==names[2][1] && names[3][0]==names[3][1]) {
        cout<<endl<<"You know your basketball."<<endl;
        ppts++;
    }
    else {
      cout<<endl<<"Looks like you dont know your basketball."<<endl;
      opts++;
    }
    }

    //Outputting to a file
    out<<endl<<"Your player name was "<<player<<"."<<endl;
    out<<"You played against "<<oponent<<"."<<endl;
    out<<"The game took place at "<<crtNam<<"."<<endl;

    if (ppts==3){
        cout<<endl<<"Congratulations "<<player<<" you beat "<<oponent<<" in a 1v1"<<endl
        <<"pickup game!! The game summary will be output to a file. Thank you"<<endl;
        out<<"You won the game."<<endl;
        out<<"The score was "<<ppts<<" - "<<opts<<endl;
    }else if (opts==3){
        cout<<endl<<"Im sorry "<<player<<" you lost to "<<oponent<<" in a 1v1"<<endl
        <<"pickup game!! The game summary will be output to a file."<<endl;
        out<<"You lost the game."<<endl;
        out<<"The score was "<<ppts<<" - "<<opts<<endl;
    }
    //Ask to play again
    cout<<"Would you like to play again? 'Y' or 'N'? "<<endl;
    cin>>plyAgn;
    plyAgn=toupper(plyAgn);
    if(plyAgn!='Y') reDsply=false;

    //Close file
    out.close();
    }while(reDsply);

    //Say goodbye
    cout<<endl<<"Thank you for playing NBA ALLSTARS!"<<endl;
return (0);
}
```

```cpp
//00000000111111111122222222223333333333444444444455555555556666666666677777777
778
//3456789012345678901234567890123456789012345678901234567890123456789012345667
890
//                 Print Court
//**************************************************************************
void prntCrt(int crt[],int n){
   cout<<endl;
   cout<<" _____ "<<endl;
   cout<<"|   |   |        |    |   |"<<endl;
   cout<<"| "<<crt[1]<<" |   |        |    | "<<crt[5]<<"  |"<<endl;
   cout<<"|   |   |        |    |   |"<<endl;
   cout<<"|   |   |_____|    |   |"<<endl;
   cout<<"|   \\   \\       /    /   |"<<endl;
   cout<<"|   \\   \\      /    /   |"<<endl;
   cout<<"|    \\   \_____/    /    |"<<endl;
   cout<<"|    "<<crt[2]<<"  \\          /  "<<crt[4]<<"    |"<<endl;
   cout<<"|        \\      /        |"<<endl;
   cout<<"|         \_____/          |"<<endl;
   cout<<"|             "<<crt[3]<<"            |"<<endl;
   cout<<"|_____|"<<endl;
   cout<<endl;
}


//00000000111111111122222222223333333333444444444455555555556666666666677777777
778
//3456789012345678901234567890123456789012345678901234567890123456789012345667
890
//                 Fill Array
//**************************************************************************
void fillCrt(int crt[],int n){
   for(int i=1;i<n;i++){
      crt[i]=i;
   }
}
//00000000111111111122222222223333333333444444444455555555556666666666677777777
778
//3456789012345678901234567890123456789012345678901234567890123456789012345667
890
//                 Assign opponent a different location
//**************************************************************************
bool assgnLoc(int crt[], short selOp, short loc){
   if (selOp==1 && loc==1) return true;
```

```
    else if (selOp==2 && loc==2) return true;
    else if (selOp==3 && loc==4) return true;
    else if (selOp==4 && loc==5) return true;
    else return false;
}
```