

(1) Student and Computing Information

- Nicholas Phillips and Student ID: A031344011
- Advance Programming Principles and Assignment 4.
- Completed on a MacBook Pro running macOS Monterey version 12.1. The compiler used was visual studios.

(2) Purpose statement: The purpose of this assignment is for students to become familiar with strings, c-string, arrays, structure data, and conditional statements. For this assignment, we used structured data to hold data types of each of the six players (name, number, and points). Then, the program will loop through a for loop asking the user to input the name, number, and points scored by each of the six players. Once each player's data is recorded, all the information will be presented in a table. Once the table is printed out, the program will then add up all the player's points to find the total points by the team using a for a loop. Lastly, the program will then find the player who scored the highest amount of points using a for loop and if statement. This information will then be printed out displaying the player's name and number.

(3) C++ Code

```
/*  
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strings, c-string, arrays, structure data, and conditional statements. For  
this assignment, we used structured data to hold data types of each of  
the six players (name, number, and points). Then, the program will loop  
through a for loop asking the user to input the name, number, and points  
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```

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printed out displaying the player's name and number.

```
*/
```

```
#include <iostream>
```

```
#include <iomanip>
```

```
#include <string>
```

```
#include <stdio.h>
```

```
using namespace std;
```

```
const int SIZE = 100;
```

```
const int VOLLEYBALL_PLAYERS = 2; //Number of players on the volleyball team.
```

```
struct Players
```

```
{
```

```
    char name[SIZE]; //Player's Name
```

```
    int number; //Player's Number
```

```
    int points; //Points Scored
```

```
};
```

```
int main () {
```

```
    Players *players = new Players[VOLLEYBALL_PLAYERS]; //Array of structures
```

```

int i; //Loop Control Variable

int total=0; //Total number of points scored by the team.

//Reference to slide 49 and 50 lecture 10

//Loops through all the players and asks for their name, number, and points
for (i = 0; i < VOLLEYBALL_PLAYERS; i++ ) {

    cout<<"PLAYER #"<<i+1<<endl; //Will add 1 to the players number.

    cout<<"-----"<<endl; //Divider

    cout<<"Player's name: ";

    cin.getline(players[i].name, 100); //Gets line, will read up to 100 characters
for the user's name

    cout<<"Player's number: ";

    (cin >> players[i].number).get(); //Gets the user's number.

    cout<<"Points scored: ";

    (cin >> players[i].points).get();

    cout<<" "<<endl;

}

//Displays for the name, number, and points for all the players

cout << "Here is the players data:\n\n";

cout << "    Name    Number    Points    \n";

cout << "-----\n";

for (i = 0; i < VOLLEYBALL_PLAYERS; i++)

{

    cout << setw(8) << players[i].name; //set width

    cout << setw(8) << players[i].number; //set width

    cout << setw(8) << players[i].points << endl; //set width

```

```

}

cout << "-----\n";

//Calculate the total points
for (i = 0; i < VOLLEYBALL_PLAYERS; i++)
{
    total += players[i].points;
}

//Display the results of the total points.
cout << "\n\nThe total of points scored by the team are: ";
cout << total << endl;

int max=players[0].points;
int maxIndex = 0;

//Finds the player who scored the highest points
for (i = 0; i < VOLLEYBALL_PLAYERS; i ++) {
    if (players[i].points > max) {
        max = players[i].points;
        maxIndex = i;
    }
}

```

```

//Displays the player with the highest points

cout << "The highest scorer of the game is: " << players[maxIndex].name << " they
are number: " << players[maxIndex].number << " on the team."<<endl;

}

```

(4) Output from the code.

This is the output of the code ran correctly.

The screenshot shows a C++ IDE with the following output in the terminal:

```

PLAYER #2
Player's name: Mike
Player's number: 1
Points scored: 12

PLAYER #3
Player's name: Lisa
Player's number: 8
Points scored: 56

PLAYER #4
Player's name: Amber
Player's number: 4
Points scored: 32

PLAYER #5
Player's name: Zach
Player's number: 88
Points scored: 1

PLAYER #6
Player's name: Paul
Player's number: 13
Points scored: 44

Here is the players data:


| Name  | Number | Points |
|-------|--------|--------|
| Nick  | 6      | 44     |
| Mike  | 1      | 12     |
| Lisa  | 8      | 56     |
| Amber | 4      | 32     |
| Zach  | 88     | 1      |
| Paul  | 13     | 44     |



The total of points scored by the team are: 189
The highest scorer of the game is: Lisa they are number: 8 on the team.
(base) temp@temp-MacBook-Pro CPSC 246 %

```

This is the output when the user enters the wrong data type. The program will stop running and will calculate any of the data it was entered in prior.

```
Get Started Assignment4.cpp X
Assignment4.cpp > main()
24
25 const int SIZE = 100;
26 const int VOLLEYBALL_PLAYERS = 6; //Number of players on the volleyball team.
27
28 struct Players
29 {
30     char name[SIZE]; //Player's Name
31     int number; //Player's Number
32     int points; //Point's Scored
33 };
34
35 int main () {
36
37     Players *players = new Players[VOLLEYBALL_PLAYERS]; //Array of structures
38     int i; //Loop Control Variable
39     int total=0; //Total number of points scored by the team
40
41     //Enter the data for the players
42     for (i = 0; i < VOLLEYBALL_PLAYERS; i++)
43     {
44         cout << "Enter the name of the player: ";
45         get_string(players[i].name, SIZE);
46         cout << "Enter the number of the player: ";
47         int number;
48         while (number < 1 || number > 100)
49         {
50             cout << "Invalid number. Please enter a number between 1 and 100: ";
51             number = 0;
52         }
53         players[i].number = number;
54         cout << "Enter the points scored by the player: ";
55         int points;
56         while (points < 0 || points > 100)
57         {
58             cout << "Invalid points. Please enter a number between 0 and 100: ";
59             points = 0;
60         }
61         players[i].points = points;
62         cout << "Player's name: " << players[i].name << "Player's number: " << players[i].number << "Points scored: " << players[i].points << endl;
63     }
64
65     //Display the total points scored by the team
66     cout << "The total of points scored by the team are: " << total << endl;
67
68     //Display the highest scorer of the game
69     int highest_scorer = 0;
70     for (i = 0; i < VOLLEYBALL_PLAYERS; i++)
71     {
72         if (players[i].points > highest_scorer)
73             highest_scorer = players[i].points;
74     }
75     cout << "The highest scorer of the game is: " << highest_scorer << " and they are number: " << highest_scorer << " on the team." << endl;
76
77     //Delete the array of structures
78     delete[] players;
79
80     return 0;
81 }
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
(base) temp@temp-MacBook-Pro CPSC 246 % cd "/Users/temp/Desktop/CPSC 246/" && g++ Assignment4.cpp -o Assignment4 && "/Users/temp/Desktop/CPSC 246/"Assignment4
PLAYER #1
Player's name: Nick
Player's number: 6
Points scored: 44

(base) temp@temp-MacBook-Pro CPSC 246 % cd "/Users/temp/Desktop/CPSC 246/" && g++ Assignment4.cpp -o Assignment4 && "/Users/temp/Desktop/CPSC 246/"Assignment4
PLAYER #1
Player's name: 1
Player's number: 2
Points scored: 3f

PLAYER #2
Player's name: Player's number: a
Points scored:
PLAYER #3
-----
Player's name: Player's number: Points scored:
PLAYER #4
-----
Player's name: Player's number: Points scored:
PLAYER #5
-----
Player's name: Player's number: Points scored:
PLAYER #6
-----
Player's name: Player's number: Points scored:
Here is the players data:

  Name    Number    Points
  ----    -
  1        2        3
  0        0
  0        0
  0        0
  0        0
  0        0

The total of points scored by the team are: 3
The highest scorer of the game is: 1 they are number: 2 on the team.
(base) temp@temp-MacBook-Pro CPSC 246 %
```