



# University of Central Punjab

## Faculty of Information Technology

### **GYM CANDIDATE'S BODY ANALYSIS SYSTEM**

#### **Project Details:**

You need to store the first name, second name, weight and height of the people in different arrays either using files or from console.

For example:

```
first_name = ['Bones', 'Welma', ..., ...]  
last_name  = ['Smith', 'Seger', ..., ...]  
weight     = [87, 72, , ..., ...]  
height     = [169, 158, , ..., ...]
```

This way we could easily store the information and for accessing, the first index of each array corresponds to the data belonging to the same person, you can use 2D array if you are not comfortable with parallel arrays.

#### **If user want to analyze the height of their people in the gym:**

- Sorts them in increasing order of the height using any sorting algorithm.
- Searches the name of the 2nd tallest person, the 3rd shortest person and the person having a height equal to highest height in the record.

#### **If user want to analyze the weight of their people in the gym:**

- Sorts them in decreasing order of the weight using any sorting algorithm.
- Searches the name of the lowest weight person, the 5th highest weighted person and the person having a weight equal to lowest weight in the record.

### **If user want to calculate the BMI of their people in the gym:**

- Display names, height & weights of all the person in the gym.
- Ask the first name of person to the user whose BMI needs to be calculated.
- Display the BMI of that specific person and ask user to continue calculating BMI or wants to quit.
- You can use the following formula to calculate BMI :
- **BMI = kg/m<sup>2</sup>** where kg is a person's weight in kilograms and m<sup>2</sup> is their height in meters squared.

### **Welcoming Display:**

- Following welcoming messages must be displayed:
- **Welcome to the GYM CANDIDATE'S BODY ANALYSIS SYSTEM**
- ENTER YOUR NAME :
- ENTER YOUR GYM NAME :
- HOW MANY CANDIDATES YOU HAVE:
- Ask user about the number of persons and create the desired arrays of that specific size and so on.
- Display the choices.
- 1 for height analysis, 2 for weight analysis and 3 for BMI calculator.

### **Front end:**

- User can enter his or her name and the name of his or her gym.
- Ask user about the number of persons and create the arrays of that specific size.
- User can get output on console or through files of their choosing
- Program should not end until users finish or wishes to end their task.
- User can enter any of their choice after all the data populated in arrays successfully.
- User can quit or restart the process.

### **Functions:**

You can take idea from the following functions to implement this system:

- Regrow , read data from file by using regrowing technique (if required)
- Display Welcome message
- Display menu
- Ask choice
- Create Dynamic arrays

- Populate Data in arrays
- Print Details
- Sort heights
- Sort weights
- Binary search , used to search elements
- Print Parallel arrays
- Calculate BMI

**Note: You can use as many helper function for your ease.**

### **Backend:**

- Use separate function for every task that is controlled by menu function which guides users through the various options.
- Use separate functions for storing data such as file input/output
- Handle any and all sanity checks such as “size < 1”
- In case there are any operations the program cannot perform, show a proper error message on screen to user to clearly state what is wrong with the input
- Code should be thoroughly commented with appropriate details
- There should be no memory leakage at all throughout the program
- All code must be 100% generic

### **Topic Covered:**

Following topics must be used to implement this system:

- Dynamic Arrays
- Pointers
- Functions
- Filing
- Regrow
- Shrink

**Note: You can also use 2D arrays to implement this system.**

