Basics: From C to C++

Computer Programming for Engineers (DSAF003-42)
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Assignment : PA1

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PA1

- There is a class that the number of students is 10. Their nickname are ‘A’ to ‘J’.
- As the new semester comes, they had to take a physical exam.
- So, their teacher measured their height and weight one by one.
- Using their height and weight, calculate their BMI(Body Max Index: BMI provides a simple numeric measure of a person's thickness or thinness)
- BMI: weight(kg) / height(m)^2
- And then, Find who is the closest the best BMI(21), the lowest BMI and the highest BMI

Must follow rules – functions

- **struct Student**
  - Student struct has nickname, height, weight

- **find_best_bmi_student()**
  - Is inputted an array and address of best_bmi_student
  - Using pointer change the value of best_bmi_student to the student's nickname who is the closest to the best_bmi(21)

- **find_lowest_highest_bmi_student()**
  - Is inputted an array and variables(lowest_bmi_student, highest_bmi_student)
  - Using reference change the value of lowest_bmi_student and highest_bmi_student to the student's nickname who is the lowest BMI and highest BMI respectively

Must follow rules – main function

- **student_array is an array that has 10 Student structure**
  - Length of student_array is 10(total number of students)
  - Each array element is structure of Student.

- **Using for statement, input their nickname, height, weight**
  - Input their nickname “A” to “J” sequentially.
  - Input their height(160+rand()%20), weight(50+rand()%20) one by one sequentially.

Codes and output examples

```cpp
#include <iostream>
#include <cmath>
using namespace std;

struct Student{
};
void find_best_bmi_student(){
}
void find_lowest_highest_bmi_student(){
}
int main(){
    int seed;
    cout << "Input Seed: ";
    cin >> seed;
    srand(seed);


    find_best_bmi_student(student_array, &best_bmi_student);
    cout << "The best bmi student: " << best_bmi_student <<endl;

    find_lowest_highest_bmi_student(student_array, lowest_bmi_student, highest_bmi_student);
    cout << "The lowest bmi student: " << lowest_bmi_student <<endl;
    cout << "The highest bmi student: " << highest_bmi_student <<endl;

    return 0;
}
```

```
Input Seed: 21
The best bmi student: D
The lowest bmi student: B
The highest bmi student: C
```

```
Input Seed: 12
The best bmi student: I
The lowest bmi student: E
The highest bmi student: A
```