21BDS0340

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Structured and Object-Oriented Programming

BCSE102

Program Set 2

### Question 1

### AIM

Develop C program to dynamically receive n float values which are nothing but bmi of people working in an organization. Print the index who have ideal bmi (18.6 -  24.9). Define a function named printIndex\_Regno, to complete the task.

### Algorithm / Pseudocode

void printIndex\_21BDS0340(int N, float \*Bmi)

Loop from 0 to N as X

If Bmi[X] is between 18.6 and 24.9, then display X

Declare integer N

Read input and assign as N

Declare float array Bmi with N spaces

Loop from 0 to N as X

Read input and assign as Bmi[X]

Call printIndex\_21BDS0340() and pass N and Bmi as arguments

### Program Code

// 21BDS0340 Abhinav Dinesh Srivatsa

#include <stdio.h>

#include <stdlib.h>

void printIndex\_21BDS0340(int n, float \*bmi)

{

    for (int x = 0; x < n; x++)

        if (\*(bmi + x) >= 18.6 && \*(bmi + x) <= 24.9)

            printf("%d\n", x);

}

int main()

{

    int n;

    scanf("%d", &n);

    float \*bmi = malloc(n \* sizeof(float));

    for (int x = 0; x < n; x++)

    {

        scanf("%f", (bmi + x));

    }

    printIndex\_21BDS0340(n, bmi);

}

### Output

Graphical user interface, application

Description automatically generated

### Question 2

### AIM

Define a structure named staff with details like name, age, staffID, weight, height, create n structure variables to deal with respective details. Develop a function (readStaffInfo\_Regno) to read an array of structure variables’ values, then define another function (bmi\_Regno) for calculating bmi for each staff and categorize them based on the below value, display staffID, bmi, category for each.

Underweight [<=18.5]

Ideal [18.6-24.9]

Overweight [>=25]

Note: [weight (kg) / height (cm) / height (cm)] x 10,000

### Algorithm / Pseudocode

Declare structure staff with 5 fields:

Character array Name with 15 spaces

Integer Age

Integer StaffID

Integer Weight

Integer Height

void readStaffInfo\_21BDS0340(int N, struct staff \*S)

Loop from 0 to N as X

Read 5 inputs and assign to S[X]'s Name, Age, StaffID, Weight and Height respectively

float bmi\_21BDS0340(struct staff S)

Declare float Bmi

Calculate Bmi as S's Weight \* 10000 / (S's Height)^2

Return Bmi

Declare integer N

Read input and assign to N

Declare struct staff array S with N spaces

Call readStaffInfo\_21BDS0340() and pass N and S as arguments

Loop from 0 to N as X

Declare float Bmi and assign by calling bmi\_21BDS0340() and pass S[X] as argument

Display S[X]'s StaffID and Bmi

If Bmi <= 18.5, then display "Underweight"

Else if Bmi <= 24.9 and Bmi >= 18.6, then display "Ideal"

Else if Bmi >= 25, then display "Overweight"

### Program Code

// 21BDS0340 Abhinav Dinesh Srivatsa

#include <stdio.h>

#include <stdlib.h>

struct staff

{

    char name[15];

    int age;

    int staffID;

    int weight;

    int height;

};

void readStaffInfo\_21BDS0340(int n, struct staff \*s)

{

    for (int x = 0; x < n; x++)

        scanf("%s%d%d%d%d", (s + x)->name, &(s + x)->age, &(s + x)->staffID, &(s + x)->weight, &(s + x)->height);

}

float bmi\_21BDS0340(struct staff s)

{

    float bmi = (float)s.weight \* 10000 / (s.height \* s.height);

    return bmi;

}

int main()

{

    int n;

    scanf("%d", &n);

    struct staff \*s = malloc(n \* sizeof(struct staff));

    readStaffInfo\_21BDS0340(n, s);

    for (int x = 0; x < n; x++)

    {

        float bmi = bmi\_21BDS0340(\*(s + x));

        printf("%d\n%0.2f\n", (s + x)->staffID, bmi);

        if (bmi <= 18.5)

            printf("Underweight\n");

        else if (bmi >= 18.6 && bmi <= 24.9)

            printf("Ideal\n");

        else if (bmi >= 25.0)

            printf("Overweight\n");

    }

    free(s);

}

### Output

Graphical user interface, application

Description automatically generated