جامعة عفت

EFFAT UNIVERSITY

CS1021 - Computer Arch and Organization

project Report - Fall 2022

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1 Project title

BMI calculator

2 Introduction

For our project, we wrote a Body Mass Index (BMI) calculator and 2 conversion calculators to help the user enter the correct inputs in the BMI function. Knowing your BMI is a good way to gauge whether your weight is in healthy proportion to your height. It is important to know about your BMI because it can help you determine any health risks you may face if it's outside of the healthy range.

3 functions details

3.1 message function

We started by this function to give the user a brief description of the BMI calculator.

3.2 inPound function

This function is for converting weight or mass measurements from kilograms (kg) to pounds (lbs). It will ask the user to Input the weight in kilograms and it will automatically convert it to inches by multiplying it by 2.20462262185 and display the result.

3.3 inInches function

This function is for converting height from CM to inches. It will ask the user to Input the Height in CM and it will automatically convert it to inches by multiplying it by 2.54 and display the result.

3.4 BMI function

Body mass index (BMI) function measures body fat based on height and weight that applies to adult men and women. It is widely used as a general indicator of whether a person has a healthy body weight for their height. The function requires the user to enter the weight in pounds and enter the height in inches and execute this operation (weight in pounds * 703 / height * height) to get his body mass index.

4 Group members

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5 execute

```
deema@deema-VirtualBox:~/cs1021/project3$ nasm -f elf64 bmiCalc.asm  -o bmiCalc.o
deema@deema-VirtualBox:~/cs1021/project3$ gcc -no-pie bmiCalc.c bmiCalc.o -o project
deema@deema-VirtualBox:~/cs1021/project3$ ./project
------------------Welcome to our BMI calculator!----------------

 Knowing your BMI is a good way to gauge whether your weight
 is in healthy proportion to your height. It is important to
 know about your BMI because it can help you to determine any
 health risks you may face if it's outside of the healthy range.

 Enter your weight in kg: 41
Your weight in pounds:
90.389527

Enter youe heigh in CM: 151
Your heigh in Inches:
59.448819

Enter your weight in Pound: 90.389527
Enter your height in Inches: 59.448819
Your BMI is:
17.979888
-----------------------------------------------------------------
deema@deema-VirtualBox:~/cs1021/project3$
```

6 CODES

6.1 assembly

```
; SECTION .DATA

  msg:    db'------------------Welcome to our BMI calculator!----------------',10
  msgLen: equ $-msg

  msg2:    db'Your weight in pounds: ',10
  msg2Len: equ $-msg2

  msg3:   db'Your heigh in Inches: ',10
  msg3Len: equ $-msg3

  msg4:   db'Your BMI is: ',10
  msg4Len: equ $-msg4



; SECTION .TEXT

GLOBAL message
message:

  mov rax, 1
  mov rdi,1

  mov rsi, msg
  mov rdx, msgLen
  syscall

  mov rax, 60
  xor rdi, rdi

  ret


GLOBAL inPound
inPound:
  mov  rax, rdi
  push rax

  mov eax, 4
  mov ebx, 1
  mov ecx, msg2
  mov edx, msg2Len

  int 80h

  pop  rax
  ret


GLOBAL inInch
inInch:
  mov  rax, rdi
  push rax

  mov eax, 4
  mov ebx, 1
  mov ecx, msg3
  mov edx, msg3Len

  int 80h

  pop  rax
```

```
  ret


Global BMI
BMI:
  mov  rax, rdi
  push rax

  mov eax, 4
  mov ebx, 1
  mov ecx, msg4
  mov edx, msg4Len


  int 80h

  pop  rax
  ret
;nasm -f elf64 bmiCalc.asm  -o bmiCalc.o
```

Listing 1: bmiCalc-asm.txtl

6.2 C

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

extern char message();
extern double inPound();
extern double BMI();
extern double inInch();

char message_c() {

    message();
    printf("\n Knowing your BMI is a good way to gauge whether your weight \n is in healthy
    proportion to your height. It is important to \n know about your BMI because it can help
     you to determine any \n health risks you may face if it's outside of the healthy range.
    ");

}

double inPound_c() {
    double x = 2.20462262185, weight, poundResult, val;

    printf("\n \n Enter your weight in kg: ");
    scanf("%lf",&weight);
    poundResult = x * weight;
    val = inPound(poundResult);
    printf("%lf",val);
}

double inInch_c() {
    double x3 = 2.54, inch, inchResult, val;

    printf("\n \nEnter youe heigh in CM: ");
    scanf("%lf",&inch);
    inchResult = inch / x3;
    val = inInch(inchResult);
    printf("%lf",val);
}


double BMI_c() {
    double x2 = 703, weight_lb, height_CM, bmiResult, H_bmi, W_bmi, val;

    printf("\n \nEnter your weight in Pound: ");
    scanf("%lf",&weight_lb);
```

```
42
43      printf("Enter your height in Inches: ");
44      scanf("%lf",&height_CM);
45
46      H_bmi = (height_CM * height_CM);
47      W_bmi = weight_lb  * x2;
48      bmiResult = W_bmi / H_bmi;
49      val = BMI(bmiResult);
50      printf("%lf",val);
51      printf("\n-----------------------------------------------------------------\n");
52  }
53
54  double main(int argc, char *argv[]) {
55       message_c();
56      inPound_c();
57      inInch_c();
58      BMI_c();
59
60    return 0;
61  }
62  //nasm -f elf64 bmiCalc.asm  -o bmiCalc.o
```

Listing 2: bmiCalc-c.txt