

Solution LAB 08 (Nested Loop & User Function/ Methods)

اور جب پروردگار نے چند باتوں میں ابراہیم کی آزمائش کی تو ان میں پورے اترے۔ خدا نے کہا کہ میں تم کو لوگوں کا پیشوا بناؤں گا۔ انہوں نے کہا کہ (پروردگار) میری اولاد میں سے بھی (پیشوا بنائو)۔ خدا نے فرمایا کہ ہمارا اقرار خالموں کے لیے نہیں ہو اگر تا البقرۃ آیت ۱۲۲

Courage is resistance to fear, mastery of fear, not absence of fear. Mark Twain

Functions/ Methods

Standard Height Weight table taken from <http://www.rush.edu/rumc/page-1108048103230.html>

Male	Height	4' 8"	4' 9"	4' 10"	4' 11"	5' 0"	5' 1"	5' 2"
	Ideal Wt (lbs.)	74 - 90	79 - 97	85 - 103	90 - 110	95 - 117	101 - 123	106 - 130
Female	Height	5' 4"	5' 5"	5' 6"	5' 7"	5' 8"	5' 9"	5' 10"
	Ideal Wt (lbs.)	108 - 132	113 - 138	117 - 143	122 - 149	126 - 154	131 - 160	135 - 165

Note: I am writing PSVM [public static void main] and PS [public static]

Task 1: Considering weight height chart given above. Write a function to find whether or not a person is fit. Input of the function is gender, height and weight.

Simply apply if-else checks to find give input is according to table or not.

Code is given on right hand side. Copy from here and paste this code in some class say class Lab8. Replace PSVM, PS and question mark (?). Finally add code in method having ... (dots)

```
PSVM (String []args){
    if (isFit("female",4.11,105))
        ?ln("female, height:4.11, weight=105 is fit");
    else
        ?ln("female, height:4.11, weight=105 is not fit");
    if (isFit("male",4.11,125))
        ?ln("female, height:4.11, weight=125 is fit");
    else
        ?ln("female, height:4.11, weight=125 is not fit");
    if (isFit("male",5.7,140))
        ?ln("male, height:4.11, weight=140 is fit");
    else
        ?ln("male, height:4.11, weight=140 is not fit");
    if (isFit("female",5.7,85))
        ?ln("male, height:4.11, weight=85 is fit");
    else
        ?ln("male, height:4.11, weight=85 is not fit");
}
```

```
public static boolean isFit(String gender, double ht, int wt ){
    if (gender.equals("female")){
        if (ht==4.8 && wt>=74 && wt<=90)
            return true;
        else if (ht==4.9 && wt>=79 && wt<=97)
            return true;
        else if (ht==4.10 && wt>=85 && wt<=103)
            return true;
        else if (ht==4.11 && wt>=90 && wt<=110)
            return true;
        else if (ht==5.0 && wt>=95 && wt<=117)
            return true;
        else if (ht==5.1 && wt>=101 && wt<=123)
            return true;
        else if (ht==5.2 && wt>=106 && wt<=130)
            return true;
    }
    else{
        if (ht==5.4 && wt>=74 && wt<=90)
            return true;
        else if (ht==5.5 && wt>=108 && wt<=132)
            return true;
        else if (ht==5.6 && wt>=113 && wt<=138)
            return true;
        else if (ht==5.7 && wt>=117 && wt<=143)
            return true;
        else if (ht==5.8 && wt>=122 && wt<=149)
            return true;
        else if (ht==5.9 && wt>=126 && wt<=154)
            return true;
        else if (ht==5.10 && wt>=131 &&
            wt<=160)
            return true;
    }
    return false;
}
```

<p>Task 2: Write function hypotenuse and test it using code in main function.</p>	<pre>PSVM (String []args){ ?ln(hypotenuse(2,3)); //3.6055 ?ln(hypotenuse(3,4)); //5.0 }</pre>
<pre>public static double hypotenuse(double side1, double side2){ return Math.sqrt(side1*side1+side2*side2); }</pre>	

<p>Task 3: Write function factorial and test it using code in main function.</p> <pre>public static int factorial(int n){ int fac=1; for (;n>1;n--) fac=fac*n; return fac; }</pre>	<pre>PSVM (String []args){ ?ln(factorial(3)); ?ln(factorial(5)); }</pre>
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<p>Task 4: Write a function to count and return alphabets in the string. You must not count any other character like digit, space, dot, semi-colon, colon etc. Function signature is:</p>	<pre>PSVM (String []a){ ?ln(countAlphabets("what is your name?")); ?ln(countAlphabets("25 elements. ")); }</pre>
<pre>public static int countAlphabets(String s){ int i, count=0; char ch; for (i=0;i<s.length();i++){ ch=s.charAt(i); if ((ch>='A' && ch<='Z') (ch>='a' && ch<='z')) count++; } return count; }</pre>	

<p>Task 5: Code to find whether a given number is prime number or not is given in lecture 13. I have rewritten this code on right hand side, using this function write another function to find next prime number coming after n. Idea is to start loop from n+1 with an increment of 1 and check if it is prime number return it otherwise continue increment and checking.</p>	<pre>PSVM (String []args){ ?ln(nextPrime(50)); ?ln(nextPrime(61)); } PS boolean isPrime(int n){ int i; boolean isPrime=true; for (i=2;i<=n/2 && isPrime;i++) if (n%i==0) isPrime=false; return isPrime; }</pre>
<pre>public static int nextPrime(int n){ boolean isNotPrime=true; while(isNotPrime){ n++; if (isPrime(n)) isNotPrime=false; } return n; }</pre>	