

This file contains all program given in lab and homework before midterm. Therefore instead of opening different files you can find all in one.

LAB 01 (Introduction)

وہی تو ہے جس نے سورج کو روشن اور چاند کو منور بنایا اور چاند کی منزلیں مقرر کیں تاکہ تم برسوں کا شمار اور (کاموں کا) حساب معلوم کرو۔ یہ (سب کچھ) خدا نے تدبیر سے پیدا کیا ہے۔ سمجھنے والوں کے لیے وہ اپنی آیاتیں کھول کھول کر بیان فرماتا ہے (آیت نمبر ۱۰ سورۃ ۱۱)

Mercy means to be kind when there is no need to be kind!

Welcome to first programming lab, as you are going to program in Java, you need some software to do programming. Though there are many softwares as option here we will begin with “**Textpad**”, a simple and light weight software. In Lab you can find **Textpad** in windows menu, may be inside “**Java**” group or just outside.

Once you succeed to open “**Textpad**” next you have to type your first program taking care of spaces, small and capital letters:

```
class FirstProgram{
    public static void main(String []args){
        System.out.println("Starting first program with name of Allah! ");
        System.out.println(3+5*6);
        System.out.println(10/3*3);
        System.out.println(10/3.0*3);
        System.out.println("End of first program!");
    }
}
```

- Press **Ctrl+S** to save this program, you will see this screen
- Type name against **File name:**
- Select **Java** in front of **Save as type:** drop down box
- **Compile** by pressing **Ctrl+1** keys on keyboard
If there are errors correct them and recompile otherwise move to next step
- **Execute** by pressing **Ctrl+2** keys on keyboard

Well done first program completed.

Further create more programs by changing class name that is:

```
class SecondProgram{
```

Now from file menu select Save As or press F12 key from keyboard and give file name: **SecondProgram**

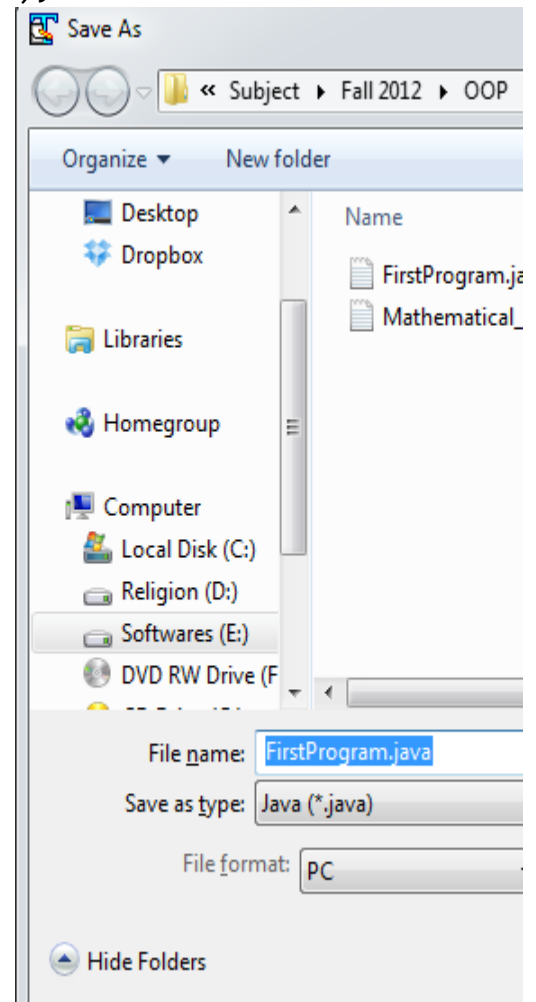
Write some other mathematical expressions like 3 written in first program and once again compile and execute your program.

Now if you have too bored you may leave the Lab or you can create more programs. I suggest use following functions:

System.out.println: to print in separate line each time

System.out.print: to print in same line

You may write different messages using " . . . "



LAB 02 (Printing + Variables)

اور جو کافر ہیں ان کے لئے دنیا کی زندگی خوشنما کر دی گئی ہے اور وہ مومنوں سے تمسخر کرتے ہیں لیکن جو پرہیزگار ہیں وہ قیامت کے دن ان پر غالب ہوں گے اور خدا جس کو چاہتا ہے بے شمار رزق دیتا ہے (آیت نمبر ۲۱۲ سورۃ ۲)

Action is the foundational key to all success. Pablo Picasso

Hope you have enjoyed first lab, if not then try to do enjoy onwards, unfortunately you have no other choice.

Just type following code and try to understand it to perform next tasks:

```
class PrintUsingEscapeSequence{
    public static void main(String []args){
        System.out.println("a.\nb.\nc.");
        System.out.println("1234\r56");
        System.out.println("Hamid\t83");
        System.out.println("Khawar\t73");
        System.out.println("Sum==\b23");
        System.out.println("He has given \"very good\" comments.");
        System.out.println("Let\'s walk!.");
        System.out.println("He has given Rs.1000 \\-");
    }
}
```

Task 1: Print 1 to 5 in separate lines using 1 print statement

Task 2: Print following paragraph using multiple print statements:

Sajid is a bank employee. Sajid's designation is Cashier. He earns Rs. 40000/- per month. He lives in "Gulberg III".

Once again type following program and try to understand for next tasks:

```
import java.util.*;
class Marks{
    public static void main(String []args){
        Scanner scan=new Scanner(System.in);
        System.out.print("Enter your matric marks:");
        int marks=scan.nextInt();
        System.out.println("Percentage Marks are:"+(marks/900.0*100));
    }
}
```

Task 3: Take two numbers as input from user. Print their sum, difference, product, division and remainder

Make your program interactive like show numbers with + symbol followed by sum and same for other operations

Task 4: Take date and month as input from user in integer type variables and print date in following formats:

- 13-7-2012
- 13/7/2012

Task 5: Take hour, minute and seconds as input from user in integer type variables and print time in following formats:

- 2:13:45
- 2 hours 13 minutes and 45 seconds

اور اس دن سے ڈرو جب کوئی کسی کے کچھ کام نہ آئے اور نہ کسی کی سفارش منظور کی جائے اور نہ کسی سے کسی طرح

کا بدلہ قبول کیا جائے اور نہ لوگ (کسی اور طرح) مدد حاصل کر سکیں۔ البقرة آیت ۳۸

Homework 01

[Print Statements, Mathematical Expressions, Relation & Logical Expressions]

Task 1

Write table of 5 using println statement, taking care of spaces to show result as shown above?	<pre> 5 * 1 = 5 5 * 2 = 10 5 * 3 = 15 5 * 4 = 20 5 * 5 = 25 5 * 6 = 30 5 * 7 = 35 5 * 8 = 40 5 * 9 = 45 5 * 10 = 50 </pre>
--	--

Task 2

Show output given on right hand side using println statements?	<pre> 1 2 3 4 5 </pre>
--	-------------------------------------

Task 3

Extend task 2 to show output given on right hand side using println statements?	<pre> 1 1 2 2 3 3 4 4 5 5 </pre>
---	---

Task 4

Write print statement for following mathematical expressions?
1. $\frac{5}{2}$
2. $\frac{5+3}{2.0}$
3. $\frac{5+3}{1.5+2.5}$
4. $\frac{5}{2.0} - \frac{3}{2.0}$

Task 5

Write print statement for following logical expressions?
1. $2 = 3$ and $3 < 5$
2. $5 \neq 3$ or $3 == 6$
3. Not $5 \neq 3$ or $3 == 6$ Not is with complete expression
4. Not $5 \neq 3$ or Not $3 == 6$ Not is with individual expressions

LAB 03 (Selection using If Condition)

اور جو شخص محنت کرتا ہے تو اپنے ہی فائدے کے لئے محنت کرتا ہے۔ اور خدا تو سارے جہان سے بے پروا ہے (آیت نمبر ۶ (سورة ۲۹)

A dream doesn't become reality through magic; it takes sweat, determination and hard work. Colin Powell

Lab is based on Lecture 7, however prior concepts also required

Task 1: Print first four powers of 2, 3, and 4 in separate lines using power function from Math class.

Note: Use escape sequence to align output, as shown 2 4 8 16

```
3  9  27  81
4 16  64 256
```

Task 2: Write program to take two sides of right angle triangle as input and calculate hypotenuse using Pythagoras' theorem: $c^2=a^2+b^2$

Sample Run:

Enter A: 3

Enter B: 4

Hypotenuse: 5

Note: Take double as data type of variables, use nextDouble method for input. Also you have to use power and square root function from Math class

Task 3: Write program to calculate Net Salary where Basic Salary is input of the program. Procedure to calculate salary is:

- find house rent by multiplying basic salary with 0.45
- find medical allowance by multiplying basic salary with 0.10
- Add above in basic salary to calculate Gross Salary
- find provident fund by multiplying basic salary with 0.05
- Deduct provident fund from basic salary to calculate Net Salary

Use variables to store all values. Show output as shown: Basic Salary:25000

```

Salary Details
Basic Salary:      25000.0
Add:
House Rent:       11250.0
Medical Allowance: 2500.0
-----
Gross Salary:     38750.0
Less:
Provident Fund:   1250.0
-----
Net Salary:       37500.0
-----
```

Task 4: Complete code written inside main function to show output given on right hand side?

```

String space="      ";
System.out.println(space.substring(0,0)+"*");
*
*
*
*
```

Task 5: Complete code written inside main function to show output given on right hand side?

Resource Person: Abdul Mateen

```
String s="This is third lab";
int pos1=0,pos2;
pos2=s.indexOf(' ');
System.out.println(s.substring(pos1,pos2));
pos1=pos2+1;
pos2=s.indexOf(' ',pos1);
System.out.println(s.substring(pos1,pos2));
```

This
is
third
lab

جو لوگ ایمان لائے اور نیک عمل کرتے اور نماز پڑھتے اور زکوٰۃ دیتے رہے ان کو ان کے کاموں کا صلہ خدا کے
ہاں ملے گا اور (قیامت کے دن) ان کو نہ کچھ خوف ہو اور نہ وہ غمناک ہوں گے۔ البقرة آیت ۲۷۷

Homework 02

[Math & String class Functions]

Note1: Homework is given assuming that you have read lecture notes 05 and understand the codes given in the notes; however; if unfortunately you don't have lecture notes still you can try.

Note2: You may have to use some functions from Math or String class not discussed in class. To use them you may see documentation given at the end of lecture notes 5 or Google it.

Note3: If you are unable to do any task move to next. If you can perform any task partially do it.

Task 1

Write first five powers of 2 using power function and show output as given or right hand side?

2¹=2
2²=4
2³=8
2⁴=16
2⁵=32

Task 2

Create a program to take r, theta (30, 45, 60, 90 etc.) as input from user. Calculate and show following?

Area of Square: r^2

Area of Circle: πr^2

Area of Sector: $\frac{1}{2} r^2 \theta$: For this use Math.**toRadians** function see

Task 3

Create a program to take theta (in degrees) as input. Show sin, cos and tan ?

If your output is not correct again use Math.**toRadians** function to convert theta in radians

Task 4

String s = "welcome" Use print statements using substring function to show output as shown on right hand side.	welcome welcom welco welc wel we w
--	--

Task 5

String s = "welcome" Use print statements using charAt function to show output as shown on right hand side. There are spaces in between letters.	w e l c o m e
--	---------------

Task 6

String s = "Welcome"

Show s as it is, in upper case and lower case. See function **toLowerCase** & **toUpperCase** in String class**Task 7**

String s1="Welcome"; // Use concat function s1.concat(" MIT"); and print s1

LAB 0 4(Selection using If Condition)

یہ دنیا کا تھوڑا سا فائدہ ہے پھر آخرت میں تو ان کا ٹھکانا دوزخ ہے اور وہ بری جگہ ہے (آیت نمبر ۱۹۷ سورۃ ۳)

[A question that sometimes drives me hazy: am I or are the others crazy?](#) Albert Einstein

Lab is based on Lecture 7, however prior concepts also required

Task 1: Related to ATM. Randomly generate account balance between 3000 and 20000. If balance is > 10000, show message "Sufficient Balance", otherwise, show message "Sorry! Insufficient Balance"

Run program for number of times to get both messages.

Task 2: Write program to generate age randomly between 5 to 45 and print messages according to criteria:

```
age < 10      Child
10 <= age < 20  Teenage
20 <= age < 40  Young
>=40        Above Young
```

Task 3: Generate 3 numbers randomly without any range and print them in ascending order?

Task 4: Input salary as input and calculate salary using formulas?

salary < 200000 tax = 10% - salary < 300000 tax = 15% - otherwise tax = 20%

Task 5: Complete code written inside main function to show output given on right hand side. Here same data is shown twice, first ordering is done on the basis of salary; whereas; in second ordering is done on the basis of name?

```
String s1="Ahmad Kamal", s2="Amjad Hussain";
int salary1=30000, 28000;
```

Note: Use if condition to show output, don't write hard code

```
Salary wise:
Amjad Hussain 28000
Ahmad Kamal   30000
Name wise:
Ahmad Kamal   30000
Amjad Hussain 28000
```

Task 6: Complete code to print Truth Table as shown using composite if condition:

```
boolean a=true, b=true;
```

```
...
```

```
...
```

```
a = true, b = false;
```

```
...
```

```
...
```

Note: First complete and table than print or table. Use \t for formatting

A	B	A and B
true	true	true
true	false	false
false	true	false
false	false	false

A	B	A or B
true	true	true
true	false	true
false	true	true
false	false	false

اور اگر وہ ایمان لاتے اور پرہیز گاری کرتے تو خدا کے ہاں سے بہت اچھا صلہ ملتا۔ اے کاش، وہ اس سے واقف ہوتے۔ البقرة آیت ۱۰۳

The difference between stupidity and genius is that genius has its limits. Albert Einstein

Homework 03

[String and Math Functions, General Programming Practice]

Note1: Output is made clear by showing boxes so that spaces can be counted.

Note2: Don't do hard coding in task use formulas and functions to generalize your programs.

Note3: In task 7 output on right hand side is of two different runs of the program

Task 1:

Complete code written inside main function to show output given on right hand side?

```
String space="          ";
System.out.println("*");
System.out.println("*"+space.substring(0,0)+"*");
```

*							
*	*						
*		*					
*			*				
*				*			
*					*		
*	*	*	*	*	*	*	*

Task 2:

Complete code written inside main function to show output given on right hand side?

```
String space="          ";
System.out.println("*");
System.out.println("*"+space.substring(0,0)+"*");
```

			*				
		*		*			
	*			*			
*				*			
*	*	*	*	*	*	*	*

Use Random Function for Next 3 Tasks

Task 3

Print 5 real values between 200 and 300

Task 4

Print 5 integer values between -200 & -100

Task 5

Print 5 capital alphabets

Help: Capital alphabets have ASCII code from 65 to 90. Type cast in char to show alphabet like

```
System.out.println((char)65); //will show A as output
```

Task 6

Write a program to take full name as input from user using **nextLine** method of Scanner class. Full name includes first name & last name like "Muhammad Hamid". Take two String variables **firstName** & **lastName**. Assign first part of name in firstName & second part in lastName. Finally display them in separate line. Don't hard code use appropriate functions from String class.

Task 7:

Write program to calculate quadratic roots using formula $\frac{-b+\sqrt{b^2-4ac}}{2a}$ and $\frac{-b-\sqrt{b^2-4ac}}{2a}$. Take a, b, c as double values from user, calculate x1, x2 roots and display answer. See the sample run on right hand side.	A:2 B:5 C:3 X1:-1.0 X2:-1.5 A:4 B:9 C:5 X1:-1.0 X2:-1.25
---	---

LAB 05 (Selection/ Repetition)

اور مومن عورتوں سے بھی کہہ دو کہ وہ بھی اپنی نگاہیں نیچی رکھا کریں اور اپنی شرم گاہوں کی حفاظت کیا کریں اور اپنی آرائش کو ظاہر نہ ہونے دیا کریں مگر جو ان میں سے کھلا رہتا ہو۔ اور اپنے سینوں پر اوڑھنیاں اوڑھے رہا کریں اور اپنے خاوند اور باپ اور خسر اور بیٹیوں اور خاوند کے بیٹوں اور بھائیوں اور بھتیجیوں اور بھانجیوں اور اپنی عورتوں اور لونڈی غلاموں کے سوا نیز ان خدام کے جو عورتوں کی خواہش نہ رکھیں یا ایسے لڑکوں کے جو عورتوں کے پردے کی چیزوں سے واقف نہ ہوں (غرض ان لوگوں کے سوا) کسی پر اپنی زینت (اور سنگار کے مقامات) کو ظاہر نہ ہونے دیں۔ اور اپنے پاؤں (ایسے طور سے زمین پر نہ ماریں) کہ جھنکار کانوں میں پہنچے اور ان کا پوشیدہ زیور معلوم ہو جائے۔ اور مومن! سب خدا کے آگے توبہ کرو تا کہ فلاح پاؤں اور آیت ۳۱

Lab is based on last week lectures and Lecture 9 related to repetition. If you face any problem ask TA, if they suggest you may advance to next problem, but with their advice only.

Task 1: Generate a card from deck at random. Assign a string code of 2 or 3 characters to card. First one or two characters will represent card no as cards has numbers 2,3,4,...,10,J,Q,K,A and next character will show type that is D, H, C, S respectively for "Diamond", "Heart", "Club" and "Spade". Your code is:

- "4D", 4 of Diamond
- "KS", King of Spade
- "10H", 10 of Heart

Task 2: Generate an MIT student's ID randomly. Student may belong to 2011 or 2012. Student may have section morning or afternoon. Student roll no may vary from 1 to 50. Generate 3 random numbers **one** for year, **second** for section and **third** for roll no. Using selection concatenate them to generate combined ID as you have allotted. Finally print ID.

Next tasks are related to Repetition, therefore, every task required loop

Task 3: Print first 50 odd numbers i.e. 1 to 99

Task 4: Generate 10 random numbers in range 1 to 100?

Task 5: Generate 10 capital alphabets randomly?

Task 6: Print 20 stars in a row, followed by 20 stars in column

Hint: Use two independent loops, each loop may have same or different controlling variable

Task 7: Print checker board like given on right hand side.

Hint: Use 2 print statements inside loop.

```
* * * *
* * * *
* * * *
* * * *
* * * *
* * * *
* * * *
```

Task 8: Extend Task 1 and Task 2 to generate 10 outputs of same?

System.out.println("My Lord! Help those who help themselves")

کہہ دو کہ اگر آخرت کا گھر اور لوگوں (یعنی مسلمانوں) کے لیے نہیں اور خدا کے نزدیک تمہارے ہی لیے مخصوص ہے تو اگر سچے ہو تو موت کی آرزو تو کرو۔ البقرة آیت ۹۴

A man should look for what is, and not for what he thinks should be. Albert Einstein

Homework 04

[If, Nested If]

See Next Homework for further practice, coming soon....

Note1: Output is made clear by showing boxes so that spaces can be counted.

Note2: Don't do hard coding in task use formulas and functions to generalize your programs.

Note3: In task 7 output on right hand side is of two different runs of the program

Task 1:

Write a program to input number from user (1-5). Print respective English word like One, Two, Three, Four and Five. Show error message if output is out of range?

Task 2:

Write a program to input full name from user. Check if user has given space or not to separate first and last name. If user has not given space show error message?

Task 3:

Write a program to generate 3 random numbers n1, n2 and n3 in range 1 to 10. If any of them comes same show them otherwise show message all numbers are different?

Task 4:

Write a program to generate 2 random numbers n1 and n2 in range 1 to 5. Display n and check if both are equal, show message "Same number generated again, Let me try again." generate n2 again and check if same number generated again, show message "Sorry same number again." otherwise show second number?

Next tasks are from deck of cards, if students are luckily unaware of detail of cards used in card games. Read detail of cards, otherwise move to next task:

A pack of cards called deck has 52 cards of 4 types. Each type has 13 cards, 4 types given below. Cards have two colors Red or Black see details below. Each type of card is numbered from 2-10. Where remaining 4 cards has symbols instead of number that is 11 is Jack, 12 is Queen, 13 is King and A for Ace:

Symbol	Type	Color	Symbol	Representation
D	Diamonds	Red	A	Ace
H	Hearts	Red	2 ... 10	Card values
S	Spades	Black	J	Jack
C	Clubs	Black	Q	Queen
			K	King

Task 5:

Write a program to input card type (String) and print color of the card?

Task 6:

Write a program to generate a card randomly out of deck. Idea is generate a number 1 to 13 both included. Generate another number say type 0 to 4 (4 not included). Now using checks print card like:

Four of Club

Six of Diamond

Ace of Spade

King of Diamond

Task 7:

Extend previous task to generate two cards. Check and show appropriate messages if:

- both cards have same number
- both cards have same type
- both cards have same color
- cards are in sequence

----- BEST of LUCK -----

LAB 06 (Repetition Use While/ For)

Repeating same verse from Quran thinking some of you has ignored this. You must see this in Quran and if it is in Quran surely it is for you. You may ignore if you think you are not مومن because it speaks about مومن

اور مومن عورتوں سے بھی کہہ دو کہ وہ بھی اپنی نگاہیں نیچی رکھا کریں اور اپنی شرم گاہوں کی حفاظت کیا کریں اور اپنی آرائش کو ظاہر نہ ہونے دیا کریں مگر جو ان میں سے کھلا رہتا ہو۔ اور اپنے سینوں پر اوڑھنیاں اوڑھے رہا کریں اور اپنے خاوند اور باپ اور خسر اور بیٹیوں اور خاوند کے بیٹوں اور بھائیوں اور بھتیجیوں اور بھانجیوں اور اپنی عورتوں اور لونڈی غلاموں کے سوا نیز ان خدام کے جو عورتوں کی خواہش نہ رکھیں یا ایسے لڑکوں کے جو عورتوں کے پردے کی چیزوں سے واقف نہ ہوں (غرض ان لوگوں کے سوا) کسی پر اپنی زینت (اور سنگار کے مقامات) کو ظاہر نہ ہونے دیں۔ اور اپنے پاؤں (ایسے طور سے زمین پر نہ ماریں) کہ جھنکار کانوں میں پہنچے اور ان کا پوشیدہ زیور معلوم ہو جائے۔ اور مومن! سب خدا کے آگے توبہ کرو تا کہ فلاح پاؤ: النور آیت ۳۱

Task 1: Write a program to show output given on right hand side. You may run a loop 8 times. Use another variable initialize it by 1 and multiple by 10 each time inside loop.

Note: Student who have not experienced yet what happen when int goes out of range may check this code by running loop 11 or 12 times

```
1
10
1000
10000
100000
1000000
10000000
100000000
```

Task 2: Generate a pattern given on right hand side. You may run a loop 5 times. You can take a string zeros="0000000000000000"
Inside loop print zeros.substring ...+ 1 + zeros.substring

```
1
010
00100
0001000
000010000
```

Task 3: Extend task 2 to generate a pattern given on right hand side. Use another string of spaces.

```
1
 010
  00100
    0001000
     000010000
```

Task 4: Input a string having spaces and print words separately on each line? "This is sentence of six words"

This
is
sentence
of
six
words

Take 2 integer variables 1 for start and second for end. Run a loop while end is less than length of string. Outside loop initialize start by 0. Inside loop calculate end using indexOf method. Print word using substring (start, end) than assign end to start

Task 5: Repeat task 4. Now use charAt function with print function and apply check if character is space use println function with parenthesis empty inside.

Task 6: Write a program to print angles (with difference of 15 from 0 to 180) their sin and cosine using Math class functions. Give output like this:

Angle	Sine	Cosine
0	0	1
15 ...		
...		

You may use DecimalFormat class for formatting:

```
DecimalFormat df=new DecimalFormat();[import java.text.*;]
? (df.format(Math.sin(Math.toRadians(45)));// See difference
```

System.out.println("Muslims! Pray for GAZA")

جس شخص سے اس روز عذاب نال دیا گیا اس پر خدا نے (بڑی) مہربانی فرمائی اور یہ کھلی کامیابی ہے۔ الانعام آیت ۱۶

All human actions have one or more of these seven causes: chance, nature, compulsion, habit, reason, passion, and desire. Aristotle

Homework 05

[Repetition]

Note: It is assumed that all tasks should be solved using loop.

Task 1:

Write a program to print first 10 multiple of 7

7 14 21 28 35 ... 70

Task 2:

Write a program to print 1-100 all numbers divisible by 3 or 7

3 6 7 9 12 14 15 18 21 24 27 28 ...

Task 3:

Write a program to print 1-100 all numbers divisible by 3 and 7

21 42 63 84

Task 4:

Write a program to calculate factorial of any number.

Factorial of 3 is: $3*2*1=6$ and factorial of 5 is $5*4*3*2*1=120$

Hint: Similar to sum program discussed in class and lecture notes 10

Task 5:

Write a program similar to one discussed in lecture notes 10. Modify this program to give output like this:

$1+2+3+4+5+6+7+8+9+10=55$

Note you must not hard code this program. Write program using loop and having user input. Above output is for input 10, if input is 5, output should be

$1+2+3+4+5=15$

Task 6:

Write a program to print square of first ten positive numbers?

1 4 9 16 25 36 49 64 81 100

Give distance between numbers so that squares can be distinguished

Task 7:

Write a program to show output as given on right hand side. Use the idea of printing stars given in lecture 10. Instead of stars uses space, also replace character star with character star, finally write following line inside loop to print pattern.

```
System.out.println(spaces+i);
```

```
1
 2
   3
    4
     5
      6
       7
```

Task 8:

Write a program to generate 2 random numbers n1 and n2 in range 1 to 5. Display n and check if both are equal, show message "Same number generated again, Let me try again." generate n2 again and check if same number generated again, show message "Sorry same number again." otherwise show second number?

See Assignment 1 in \\printsrv and on [web page](#) to be evaluated in the coming lab.

LAB 07 (Nested Loop & User Function/ Methods)

اے پیغمبر اپنی بیویوں اور بیٹیوں اور مسلمانوں کی عورتوں سے کہہ دو کہ (باہر نکلا کریں تو) اپنے (مومنہوں) پر چادر لٹکا (کر گھونگھٹ نکال) لیا کریں۔ یہ امر ان کے لئے موجب شناخت (وامتیاز) ہو گا تو کوئی ان کو ایذا نہ دے گا۔ اور خدا بخشنے والا مہربان ہے پاؤ الاحزاب آیت ۵۹

Wishing to be friends is quick work, but friendship is a slow ripening fruit. Aristotle

Use nested loop

Task 1: Write a program to input rows and columns and print a rectangle filled by stars like given on right hand side.

```
*****
*****
*****
*****
*****
```

Task 2: Modify task 1 to draw a hollow box of stars as discussed in lecture notes and displayed on right hand side.

```
*****
*           *
*           *
*           *
*****
```

Task 3: Write a program to generate a pattern given on right hand side.

```
1
12
123
1234
12345
123456
```

Task 4: Input 2 strings and print letters common in both strings?

Use functions/ methods

Just type code to get understanding of function creation

```
class TestFunction{
    public static void printChar(char c,int n){
        int i;
        for (i=1;i<=n;i++)
            System.out.print(c);
        System.out.println();
    }
}
```

```
public static void main(String []a){
    printChar('-',5);
    printChar('*',7);
    printChar('^',8);
    printChar('#',3);
}
```

Task 5: Write a function:

```
public static void printCounting(int s, int e)
```

The function will print number from s to e in ascending order like if s is 5 and e is 9, output will be 5 6 7 8 9.

After printing move to next line as in previous program.

```
public static void main(String []a){
    printCounting(1,5);
    printCounting(3,7);
    printCounting(-5,15);
} //use main to test your code
```

Task 6: Write a function:

```
public int void randomInt(int s, int e)
```

The function will generate a random integer between s and e and return.

```
public static void main(String []a){
    randomInt(100,500);
    randomInt(-100,100);
    randomInt(30,70);
} //use main to test your code
```

System.out.println("Muslims! Listen to your lord, follow his commandments")

جس اور جس دن قیامت برپا ہوگی گنہگار نا امید ہو جائیں گے۔ - الروم آیت ۱۲

There are no secrets to success. It is the result of preparation, hard work, and learning from failure.

Colin Powel

Homework 06 [Loop, Nested Loop]

Note: It is assumed that all tasks should be solved using loop.

Task 1:

Write a program to calculate sum of first ten positive numbers. In output show numbers separated by + sign and finally show = sign and sum:

1+2+3+4+5+6+7+8+9+10=55 [Hint: Use \b to erase last + sign]

Task 2:

Write a program to show numbers 1 to with an increment of 0.1, use DecimalFormat to show output like?

1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0

Task 3:

Write a program to input a sentence and display position of spaces in sentence like:

Space 1 at position: 4

Space 2 at position: 11

...

Task 4:

Write a program to calculate factorial of any number. Show output like if number is 5 print:

5 * 4 * 3 * 2 * 1 = 120 [Hint: use \b to erase last *]

Task 5:

Write a program to input numbers from user and print their sum. Say user to enter any positive number and enter -1 to terminate. Inside loop write print statement and input statement. Check if input is -1 terminate loop otherwise calculate count and sum and show output like:

Enter Positive Number or -1 to quit: 12

Enter Positive Number or -1 to quit: 13

Enter Positive Number or -1 to quit: 2

Enter Positive Number or -1 to quit: -1

You entered 3 numbers Sum is : 27

Task 6:

Write a program to show output as given on right hand side. Use nested loop

```

1
2 1
3 2 1
4 3 2 1
5 4 3 2 1

```

Task 7:

Write a program to show output as given on right hand side. Use nested loop

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

Task 8:

Write a program to calculate factorial of 3 to 6 using nested loop. Show output like

3!=6

4!=24

5!=120

6!=720

----- BEST of LUCK -----

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 بنائیو)۔ خدا نے فرمایا کہ ہمارا اقرار ظالموں کے لیے نہیں ہوا کرتا البقرة آیت ۱۲۴

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

Functions/ Methods

Note: For this lab you don't have to create more than 1 class. Simply add more functions in same class and add code in main method to test function, uncomment lines in main which are previously checked.

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");
```

	<pre> } PS boolean isFit(String gender, double ht, int wt){ ... } </pre>
<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 } PS double hypotenuse(double side1, double side2){ ...// $\sqrt{side1^2 + side2^2}$ } </pre>
<p>Task 3: Write function factorial and test it using code in main function.</p> <pre> PS int factorial(int n){ ... } </pre>	<pre> PSVM (String []args){ ?ln(factorial(3)); ?ln(factorial(5)); } </pre>
<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> int countAlphabets(String s) </pre>	<pre> PSVM (String []a){ ?ln(countAlphabets("what is your name?")); ?ln(countAlphabets("25 elements.")); } PS int countAlphabets(String s){ ... } // For each letter check if it is in range of capital or // small alphabet add 1 to 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; } PS int nextPrime(int n){ ... } </pre>

System.out.println("The only way to get success in this course is to code..code..code..")

اے انسان تجھ کو اپنے رب کریم کے بارے میں کس چیز نے دھوکے میں ڈال رکھا ہے۔ الانفطار آیت ۶

It is better to remain silent and be thought a fool than to open one's mouth and remove all doubts. Mark Twain

Homework 07

[Nested Loop, User Function/ Methods]

Note: Task 1-6 should be done using nested loop.

Task 1:

Write a program to input a String and print frequency of all letters within that String. For String **good**

```
g 1
o 2
o 2
d 1
```

Task 2:

Write a program to input two Strings and print characters of first string not existing in second string. Use concept of flag in inner loop

Task 3:

Print pattern given on right hand side. Pseudo code is given in lecture notes.	<pre>1 212 32123 4321234 543212345</pre>
--	--

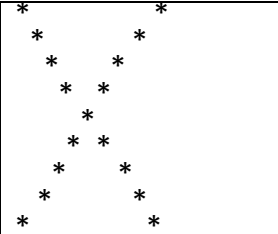
Task 4:

Print pattern given on right hand side.	
---	---

Task 5:

Print pattern given on right hand side.	
---	---

Task 6:

Print pattern given on right hand side. Hint: Use 2 set of nested loops. One for upper portion and second for lower portion.	
---	---

User Functions/ Methods

Task 7: Write a function ***void printSpaces(int n)*** to print n number of spaces in same line using System.out.print and loop

Task 8: Write a function *int greaterRandom(int n)* to receive an integer number and return random number greater than passed number.

Task 9:

Write a program *int factorial (int n)* to calculate factorial and return factorial of n

Task 10:

Write a program *boolean isAlphabet(char c)* to find whether c is alphabet or not

Task 11:

Write a program *boolean isVowel (char c)* to find whether c is vowel or not

Task 12:

Write a program *boolean isCapital (char c)* to find whether c is capital letter or not

Task 13:

Write a program *boolean isSmall (char c)* to find whether c is small letter or not

Task 14:

Write a program *boolean isNumber (char c)* to find whether c is capital letter or not

Finally test last 5 functions to categorize vowel, capital, small letter or number for any string.

----- BEST of LUCK -----