

PH 434 Programming Lab – Practical 2 (Date: 12 August 2025)

Please follow the guidelines VERY carefully. You are expected to complete all the tasks (challenge is optional) and show it to one of the TAs before you leave. They may ask you to implement/demonstrate the result and input the marks on the grade sheet. **It is your duty to ensure that marks have been noted at the end of the day.**

You are free to use your Notes to solve the problems. **Do not use the internet.** The TAs will assist you if you need some help.

Task#1: (2 marks)

Write a bash script in VIM (or text editor) called “Grades.sh” that will take as input 1) the name of a student, 2) their roll number, and 3) their marks in four subjects, English, Physics, Chemistry and Mathematics.

The code should create two files with headers and data separated by a comma (see below)

1. A file called “Candidate_list.txt” that contains the name, roll number, and all marks.
2. A file called “Merit_list.txt” which contains only the roll number and percentage obtained.

On output the two files should like (actual names and marks can be different):

```
cat Candidate_list.txt
Name, Roll-No, English, Physics, Chemistry, Mathematics
Rajesh, 10021, 89, 90, 92, 100
Afzal, 10034, 88, 93, 95, 90
Nilima, 10001, 89, 95, 92, 92
Ajay, 10099, 82, 82, 86, 86
Bharti, 10085, 85, 80, 100, 100

cat Merit_list.txt
Roll-No, Percentage
10021, xx
10034, xx
10001, xx
10099, xx
10085, xx
```

Here xx should be the calculated percentage. No need to round off.

You are expected to show the TA that the file was indeed created using the code “Grades.sh”. **They may ask you to add a new name and show that it is added to the text file.**

Task#2: (2 marks)

Write a Python script in VIM, that **asks the user for a number** (real) and prints the nearest integer less than the number. That is if you enter 5.99 it returns 5.

The output of your code should be:

Enter a number: x

Hello, the nearest integer is: y

Hint: To input something, you can use the command: `x = input("text")`. Note all inputs `x` are strings and to convert them to a real number or integer you need to use the command `float(x)` or `int(x)`, respectively.

Task#3: (1 mark)

Let us look at a conditional loop (repeated statement) in Python:

```
i = 0
while i < 10:
    i = i+1
    print (i)
```

The above code will run the loop for all values that satisfy the “while” condition.

Write and run the above code in Python and check its output. Now, use the above idea to **asks the user for a name** and print it 3 times.

Challenge:

The command **mod(x,y)** is the modulus function. It divides **x** by **y** and returns the remainder.

Also, the conditional python command (if...else) works as follows:

```
x = a # some random number
if x < 50:
    print ("Less than 10") # implements only if x < 50
else:
    print ("Equal or greater than 10") # otherwise it will implement this part
```

Using the above, write a code that **inputs or takes two random integers from the user** and checks and prints whether the sum and product of the two numbers are odd or even.

Hint: You can use `int(x)` to convert the string input `x` to an integer.