Practice Sheet

First Name: ....

Last Name: ....

Matriculation Number: ....

- Read <u>all</u> the following points before proceeding to the solution.

- Write immediately your name on this sheet.

- Write clearly. Take into consideration that Python is a case sensitive language.

- Indent your code in a sensible way.

- Books, slides, notes or other documents are not allowed.

- If you need more space to solve the exercises you may use also the back of each page.

- Read carefully the questions and strictly adhere to the requirements.

- You have two hours to solve this test.

- Any attempt to cheat leads to an immediate fail.

- By signing this sheet you imply you read and understood all of the above.

Signature: ....

%	0.00 - 39.49	39.50 - 44.49	44.50 - 49.49	49.50 - 54.49
Grade	5.0	4.7	4.3	4.0

%	54.50 - 59.49	59.50 - 64.49	64.50 - 69.49	69.50 - 74.49
Grade	3.7	3.3	3.0	2.7

74.50 - 79.49	79.50 - 84.49	84.50 - 89.49	89.50 - 94.49	94.50 - 100.00
2.3	2.0	1.7	1.3	1.0

Reference `ASCII` Table

Decimal	Character	Decimal	Character	Decimal	Character
32	space	64	@	96	'
33	!	65	A	97	a
34	"	66	B	98	b
35	#	67	C	99	c
36	$	68	D	100	d
37	%	69	E	101	e
38	&	70	F	102	f
39	'	71	G	103	g
40	(	72	H	104	h
41	)	73	I	105	i
42	*	74	J	106	j
43	+	75	K	107	k
44	,	76	L	108	l
45	-	77	M	109	m
46	.	78	N	110	n
47	/	79	O	111	o
48	0	80	P	112	p
49	1	81	Q	113	q
50	2	82	R	114	r
51	3	83	S	115	s
52	4	84	T	116	t
53	5	85	U	117	u
54	6	86	V	118	v
55	7	87	W	119	w
56	8	88	X	120	x
57	9	89	Y	121	y
58	:	90	Z	122	z
59	;	91	[	123	{
60	<	92	\	124		
61	=	93	]	125	}
62	>	94	^	126	~
63	?	95	_	127	DEL

File Methods (Selection)

```
open(pathname, mode)          f.readline()

f.close()                     f.write(aString)

f.read()
```

List Methods (Selection)

```
L.append(element)             L.pop()

L.extend(aList)               L.pop(index)

L.insert(index, element)      L.sort()
```

Dictionary Methods (Selection)

```
len(d)                        list(d.keys())

aDict[key]                    list(d.values())

d.get(key [, default])        list(d.items())

d.pop(key [, default])        d.clear()
```

String Methods (Selection)

```
s.endswith(sub)               s.replace(old, new [, count])

s.find(sub [, start [, end]]) s.split([sep])

s.isalpha()                   s.startswith(sub)

s.isdigit()                   s.strip([aString])

s.join(sequence)              s.upper()

s.lower()                     s.format(value[, format_spec])
```

Problem P.1 (3 points)

Write a program that prints to the screen all even numbers and also the numbers that are divisible by 3 for all numbers between 1 and 200 (inclusive). The program should then print on the screen the following:

```
2
3
4
6
8
9
10
...
```

Problem P.2 (5 points)

Write a program which reads in 6 integers from the keyboard and then prints these numbers and their square in the opposite order of their input to a file named `squares.txt`.
So if you enter

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

your output should look like this then:

```
6 36
5 25
4 16
3 9
2 4
1 1
```

You will lose points if you are using separate variables for each input.

Problem P.3 (3 points)

Please write a program where you first ask for an integer `n`. The program then prints `n` rows with the pattern below using nested loops.
So if you enter 6, 6 rows will be printed:

```
A
AB
ABC
ABCD
ABCDE
ABCDEF
```

Problem P.4 (4 points)

Please write a program that converts feet and inches to meters.
First write the definition of a function `to_meters(foot, inch)` that converts feet and inches to one single length meters.

Then write a short test program that repeatedly reads feet and inches from the keyboard and converts the lengths using the function
`to_meters(foot, inch)` and prints the result from outside the function. If **both** inputs are 0 then the program quits without printing anything.
Keep in mind that 1 *foot* = 30.5 *cm and* 1 *inch* = 2.54 *cm.*

Problem P.5 (5 points)
It is suggested that passwords mix letters and numbers, so passwords are not that easy to guess.
Here, a good password must have at least 8 characters and needs to contain at least three numbers.
Please write a password checker where you can **repeatedly** enter passwords. If the string is empty, the program quits. After each password entered, your program determines whether the password is good or not, and either prints "PASSWORD IS GOOD" or PASSWORD IS BAD" to the screen.

Problem P.6 (4 points)
Write the definition of the following function

`substitute_vowels(str, ch)`

A vowel is one of the letters `a, e, i, o, u` (it is sufficient to just substitute lowercase characters). The function takes a string and replaces all vowels with the given character `ch`. The function returns a string with the replacements done.
You may **not** *use the* `replace` *method to solve this assignment.*
Thus the following (incomplete) piece of code

```
s = "This is a sentence"
print(s)
n = substitute_vowels(s, 'o')
print(n)
```

will print
```
Thos os o sontonco
```

Problem P.7 (3 points)
A store sells pens. Each pen costs 45 cents. However, for more than 50 pens, the price of all pens drops to 38 cent per item, and for more than 100 pens you will just need to pay 30 cent per pen.
Please write a program where you can repeatedly enter the number of pens you would like to buy. If you enter a negative number the program should stop. Your program should compute the price that is to be paid and display this price in Euros and Cent on the screen.

Problem P.8 (3 points)
Write a function that returns the smallest value of a list of integers. You have free choice for the return type and the parameters, but do not use global values in your function.
You may not use any `sort` *method in this problem.*

Problem P.9 (4 points)
Write a program which draws two circles. One of the circles should be red and unfilled and the other one should have a green line and green filling. The two circles should be partially overlapping. You can freely select the exact values for the center and radius of both circles. Make sure that both circles fit within the drawing window. At the end also make sure that the representation of the turtle will not show.
You can assume that the window's width is 683 *and the window's height is* 576.