

CSE 101 - Introduction to Programming Tutorial 1

Topics to be covered:

1. Number systems and conversions.
2. Basic addition and subtraction.
3. Basic python operations like string slicing, exponentiation.

Ques 1: What are the bases in the following number systems? Also tell their set of valid digits.

- a. Decimal
- b. Binary
- c. Octal
- d. Hexadecimal

Remark: Students will learn about different number systems and their ranges.

Ans: A. 10, 0-9
B. 2, 0-1
C. 8, 0-7
D. 16, 0-9 and A-F

Ques 2: Convert from Binary to Decimal:

- a. 11001001
- b. 110010.01

Remark: Practise conversion of a number cross number systems.

Ans: A. 201
B. 50.25

Ques 3: Convert from Hexadecimal to Binary:

- a. FAB1
- b. 1234

Remark: Practise conversion of a number cross number systems.

Ans: A. 1111101010110001
B. 0001001000110100

Ques 4: Perform operation using 2's complements the following operations:

- a. 55 - 3
- b. 7 - 120

Remark: Learn basic arithmetic in binary number system.

Ans: A. $00110111 + 11111101 = 00110100$
B. $00000111 + 10001000 = 10001111$

Ques 5: What is the range of numbers that can be represented using 8 bits in 2's complement form?

Remark:

Ans: -128 to +127

Ques 6: What is the range of numbers that can be represented using 8 bits in Offset or Biased representation?

Remark:

Ans: -128 to +127

Ques 7: What are the basic types of errors in programming?

Remark:

Ans: Syntax, Logical and Runtime Error

Ques 8: What does Dynamic Typing Language mean?

Remark:

Ans: **Dynamic typed programming languages** are those languages in which variables must necessarily be defined before they are used. This implies that dynamic typed languages do not require the explicit declaration of the variables before they're used.

Static typed programming languages are those in which variables need not be defined before they're used. This implies that static typing has to do with the explicit declaration (or initialization) of variables before they're employed. Java is an example of a static typed language; C and C++ are also static typed languages.

Ques 9. Write Python Programs:

a) To print Square Root of a Number 'num'

b) To Solve quadratic Equation Ax^2+Bx+c

Remark: Students will learn dealing with exponent operators.

Ans:

a) num=3

num=num**(1/2)

b) Let A=2;B=3;C=4;

x1= ((-B)+(((B*B)-4*A*C)**(1/2)))/2*A

x2= ((-B)-(((B*B)-4*A*C)**(1/2)))/2*A

Ques 10.

a) What will be the output of the following commands:

```
>>> S="INTRODUCTION"
```

```
>>>S[2:8]
```

```
>>>S[::-1]
```

```
>>>S[:-5]
```

```
>>>S[::1]
```

```
>>>S[::2]
```

b) Write a Python program to print a string where '\$' is after the 1st character of S = 'I' S='INTRODUCTION' and before the last character of S String.

Remark: Students will learn about string operations like splitting.

Ans:

```
a) >>> S="INTRODUCTION"
>>> S[2:8] = TRODUC
>>> S[::-1] = NOITCUDORTNI
>>> S[:-5] = INTRODU
>>> S[:1] = INTRODUCTION
>>> S[:2] = ITOUTO
b) print(S[:1]+'$'+S[1:11]+'$'+S[-1])
```