Sunbeam Institute of Information Technology

Preparatory Assignments

The following assignments are designed to assess basic programming skills. You can find the assignments to be implemented using C **OR** Java programming language as per their comfort and their course relevance.

For Java revisions, you are advised to visit Sunbeam's YouTube channel and refer Java playlist.

https://youtube.com/playlist?list=PLsbFrbYSzxMSHVrcz_eoGKPnE17jC-3OS

For C revisions, we are conducting online classes (on Zoom) from 10-Mar to 15-Mar for Sunbeam students. Though we recommend learning live, sessions will be recorded for your reference and will be available in Sunbeam student portal till 19-Mar-2023. The registration process for Sunbeam MIS/LMS will be informed on WhatsApp groups.

It is strongly recommended to first implement all the demos in the tutorials while referring to these tutorials and then proceed to solve the assignments.

Happy Programming!

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Preparatory Assignments

Core Java Assignments

Q1. Write a program to input n numbers on command line argument and calculate maximum of them.

Q2. Write a program to calculate a Factorial of a number.

Q3. Write a program to calculate Fibonacci Series up to n numbers.

Q4. Write a program to calculate the grade of a student. There are five subjects. Marks in each subject are entered from keyboard. Assign grade based on the following rule:

Total Marks >= 90	Grade: Ex
90 > Total Marks >= 80	Grade: A
80 > Total Marks >= 70	Grade: B
70 > Total Marks >= 60	Grade: C
60 > Total Marks	Grade: F

Q5. Write a program to check the input characters for uppercase, lowercase, number of digits and other characters. Display appropriate message.

Q6. Write a program to perform matrix multiplication.

Q7. Write a program to accept a number from user as command line argument and display its table.

Q8. Write a program to read the name of a student (studentName), roll Number (rollNo) and marks (totalMarks) obtained. rollNo may be an alphanumeric string. Display the data as read. Hint: Create a Student class.

Q9. Accept an integer number and when the program is executed print the binary, octal and hexadecimal equivalent of the given number.

Sample Output:

```
terminal> java Test
Enter Number : 20
Given Number :20
Binary equivalent :10100
Octal equivalent :24
Hexadecimal equivalent :14
```

Hint: Use functions toBinaryString() , toOctalString(), toHexString() of Integer class.

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Preparatory Assignments

Q10. Read at most 10 names of students and store them into an array of String nameOfStudents[10]. Sort the array and display them back. Hint: Use Arrays.sort() method.

Q11. Create a class called Employee that includes three fields - a first name (type String), a last name (type String) and a monthly salary (double). Provide a constructor that initializes these fields. Provide a set and a get method for each instance variable. If the monthly salary is not positive, do not set its value.

Write the test code (i.e. main()) in another class EmployeeTest that demonstrates class Employee's capabilities. Create two Employee objects and display each object's yearly salary. Then give each Employee a 10% raise and display each Employee's yearly salary again.

Q12. Write a Program to reverse the letters present in the given String.

Q13. Declare an Array of type String. Display the strings which are duplicated in that array. (Hint: use equals())

Q14 Write a program to check if give string is palindrome.

Q15. Input a string from the user. Count occurrences (case insensitive) of each alphabet in the string.

Sample output:

Input: Welcome to SunBeam.
Output:
A : 1
B : 1
C : 1
E : 3
L : 1
M : 2
N : 1
O : 2
S : 1
T : 1
U : 1
W : 1

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Preparatory Assignments

C Programming Assignments

Q1. Write a program to input n numbers on command line argument and calculate maximum of them.

Q2. Write a program to calculate a Factorial of a number.

Q3. Write a program to calculate Fibonacci Series up to n numbers

Q4. Write a program to calculate the grade of a student. There are five subjects. Marks in each subject are entered from keyboard. Assign grade based on the following rule:

Total Marks >= 90	Grade: Ex
90 > Total Marks >= 80	Grade: A
80 > Total Marks >= 70	Grade: B
70 > Total Marks >= 60	Grade: C
60 > Total Marks	Grade: F

Q5. Write a program to check the input characters for uppercase, lowercase, number of digits and other characters. Display appropriate message.

Q6. Write a program to perform matrix multiplication.

Q7. Write a program to accept a number from user using command line argument and display its table.

Q8. Write a program to read the name of a student (studentName), roll Number (rollNo) and marks (totalMarks) obtained. rollNo may be an alphanumeric string. Display the data as read. Hint: Create a Student structure and write appropriate functions.

Q9. Accept an integer number and when the program is executed print the binary, octal and hexadecimal equivalent of the given number.

Sample Output:

Enter Number : 20
Given Number :20
Binary equivalent :10100
Octal equivalent :24
Hexadecimal equivalent :14

Hint: Use bitwise operators for binary conversion. Octal/Hexadecimal conversion to be done by repetitive division using recursion.

Preparatory Assignments

Q10. Read at most 10 names of students and store them into an array of char nameOfStudents[10][50]. Sort the array and display them back. Hint: Use qsort() method.

Q11. Create a structure called Employee that includes three fields - a first name (type String), a last name (type String) and a monthly salary (double). Write functions to initialize the fields, print them and modify the values in the given object. Example methods:

- void emp_init(struct emp* e);
- void set_salary(struct emp *e, double sal);
- void emp_display(struct emp *e);

Write the test code in the main(). Create two emp objects and display each object's yearly salary. Then give each Employee a 10% raise and display each Employee's yearly salary again.

Q12. Write a Program to reverse the letters present in the given String. Do not use strrev() function.

Q13. Declare an Array of type char* and initialize it with a few strings (hard-coded). Display the strings which are duplicated in that array. (Hint: use strcmp())

Q14 Write a program to check if give string is palindrome.

Q15. Input a string from the user. Count occurrences (case insensitive) of each alphabet in the string.

Sample output:

Input: Welcome to SunBeam.
Output:
A : 1
B : 1
C : 1
E : 3
L : 1
M : 2
N : 1
O : 2
S : 1
T : 1
U : 1
W : 1