Java Programming - ICT. Ed 455

Sukuna Multiple Campus

Sundar Haraicha -12

Due: 15/06/2018

This is a graded assignment and all students are required to submit their original work. In case if anyone's solution is found to be copied, you will receive a negative grade.

Objective:

The objective of theoretical question is to assess your understanding on theoretical aspect of the programming concepts.

The objective of programming question is to assess your ability on

1. Logic implementation
2. Ability to apply programming concepts
3. And problem solving skills.

Grading Policy:

For the theoretical questions, you will be graded based on the following

1. Clarity and conciseness of your answer.
2. Is your answer in accordance to the question i.e. your understanding about question and
3. Canvasing power of your answer.

For the programming problems following things are looked:

1. Naming conventions: How well you've named variables, class, and methods.
2. Logic Implementation.
3. Code formatting.
4. Result: Is the result of the program error free and does it give the correct result?

Before you start writing your code, go through the link below.

1. https://google.github.io/styleguide/javaguide.html
2. https://en.wikipedia.org/wiki/Programming_style
3. https://www.gnu.org/prep/standards/html_node/Formatting.html
4. https://code.tutsplus.com/tutorials/top-15-best-practices-for-writing-super-readable-code--net-8118

Hint for Programming Exercise:

Do not write the entire program in one go. It is easier to write small piece, test it and write further. Remember math where you'd break the problem to smaller and solve it.

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Theoretical Exercise:

1. Define data type. Explain basic data types in java with example.
2. What is meant by constant? Explain how it is created in java and purpose of constant.
3. What is the need of different types of operators? Explain.
4. Explain different types of operators that are available in java.
5. Define type casting. Explain different types of casting methods and its necessity with suitable example.
6. Explain when and how java automatically promotes data from one type to another type with example?
7. Whenever we perform some mathematical operations, java follows a rule called **operator precedence**. Now explain this rule with suitable example.
8. Explain different types of control flow statements with example.
9. Define array. Explain declaration, allocation and initialization of array.
10. Explain different types of array with example.

Programming Exercise:

1. Write a java program to implement all arithmetic operations.
2. Create a two dimensional array with some value initialized. Then fetch the value and display it on the console.
3. Write a java program to implement the following algorithm.

```
Algorithm Max(A,n)
//A is an array of size n
{
        Result := A[1];
        for i := 2 to n do
                if A[i] > Result then Result := A[i];
        print Result
}
```

4. Sukuna Campus require a program to calculate how much to pay for their hourly employees. According to the campus rule the base pay per hour is NPR 200. However if employee works more than 40 hours a week, he / she gets paid for overtime with the rate 2 times base pay, the number of extra hours worked. The campus also imposes the rule that no employee can work more than 65 hours a week. For example, an employee has worked 50 hours in a week then he / she gets paid 40 hours times base pay per hour and 10 hours of overtime, 2 times their base pay.

   Summary of Rules:
   - An employee gets paid (work hour) * (base pay), for each hour up to 40 hours
   - For every hour over 40, they get overtime = (base pay) * 2

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- The base pay must not be less than minimum wage NPR 200. If it is, print error.
- If the number of hours is more than 65 then print error.

Employee	**Base pay (NPR)**	**Hours worked**
Employee A	150	40
Employee B	200	55
Employee C	245	35
Employee D	500	21
Employee E	205	73

5. Sukuna campus is having problem with student information. Every time someone wish to see the particular student record it has to be done manually. The campus decided to automate this task, hiring some developers. However, feeling competent about students, ICT department suggested to give problem to student. In view of the suggestion from ICT department, campus now decided to give this task to ICT students. Now write a program to solve this problem.

   Note: Students record are stored based on roll number.

   Hint: https://en.wikipedia.org/wiki/Linear_search