ಭಾರತೀಯ ಮಾಹಿತಿ ತಂತ್ರಜ್ಞಾನ ಸಂಸ್ಥೆ ರಾಯಚೂರು
भारतीय सूचना प्रौद्योगिकी संस्थान रायचूर
Indian Institute of Information Technology Raichur

Lab - 2
Introduction to Programming (ID110)
Date: October 30, 2024
Topics: Functions

Time: 1.5 Hr | CSE'24, Semester - I | Max marks: 10

Instructions:

- The lab session consists of **two programming questions**, and **both are mandatory**.
- External materials (e.g., notes, books) and electronic devices (e.g., mobile phones, smart watch, bluetooth) are **strictly prohibited**. Only a **blank sheet of paper** and a **pen** may be used for rough work.
- Internet usage is **not allowed** under any circumstances. Any violations will lead to **serious academic consequences**, including potential disqualification from the lab.
- Any form of **plagiarism or academic dishonesty** will be treated with the utmost seriousness and may result in severe penalties, including a zero for the lab or further disciplinary actions.
- Code must be written from scratch during the session. Pre-written code snippets or solutions will not be accepted. Use meaningful variable names and add appropriate comments where necessary.
- Upon completion, **two code files** named after **roll no.** (e.g., `"CS24B1001-Lab2-p1.c"` and `"CS24B1001-Lab2-p2.c"`) must be submitted on **Google Classroom**. Not following the naming convention will lead to **minus marking**. The submission will only be accepted if done in the presence of TA.

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1. Write a C Program that prints maximum element's index of an integer array. The application should first determine the array's size, then read the elements separated by space into it, and lastly output the maximum element's index. Not necessary to use functions.

   (+**2** *Bonus Marks* : if you implement using functions.)

   Input Format:

   - First, an integer n representing the number of elements in the array.
   - Followed by n integers, representing the elements of the array.

   Output Format:

   - If the array is not empty, print:
     - Print: **maximum element index value.**
     - Print: **maximum element.**
   - If the array is empty, print: **Array is empty**

Examples:

- **Input:**

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

Output:

```
index: 2
element is: 5
```

- **Input:**

```
3
10 20 5
```

Output:

```
index: 1
element is: 20
```

- **Input:**

```
0
```

Output:

```
Array is empty
```

(5 marks)

2. Guddu and Bablu are saving the money they earned from wroking for Kaleen Bhaiya. They want to calculate how much they will have after a few years with compound interest applied. Design two functions:

   - ***finalAmount()*** will calculate the **final amount** in the account.
   - ***compoundInterest()*** will calculate the **compound interest** earned.

   Your program should accept inputs : the principal amount (initial deposit), the annual interest rate, the number of times interest is compounded per year, and the total number of years they plan to keep their money invested.

   Input Format:

   - A *Double* representing the **Principal Amount (P)**.
   - A *Double* representing the **Annual Interest Rate (R)** in percentage.
   - An *Integer* representing the **Number of Times Interest is Compounded Per Year (N)**.
   - An *Integer* representing the **Number of Years (T)**.

Output Format:

- Print the **final amount** after the specified number of years.
- Print the **compound interest earned**.

Formulas:

- **Final Amount (A):** $A = P \times \left(1 + \frac{R}{100 \times N}\right)^{N \cdot T}$
- **Compound Interest (CI):** $CI = A - P$

Examples:

- **Input:**

```
1000
5
4
10
```

Output:

```
Final Amount: 1648.72
Compound Interest: 648.72
```

- **Input:**

```
1500
3.5
2
5
```

Output:

```
Final Amount: 1771.57
Compound Interest: 271.57
```

(5 marks)

All the Best!