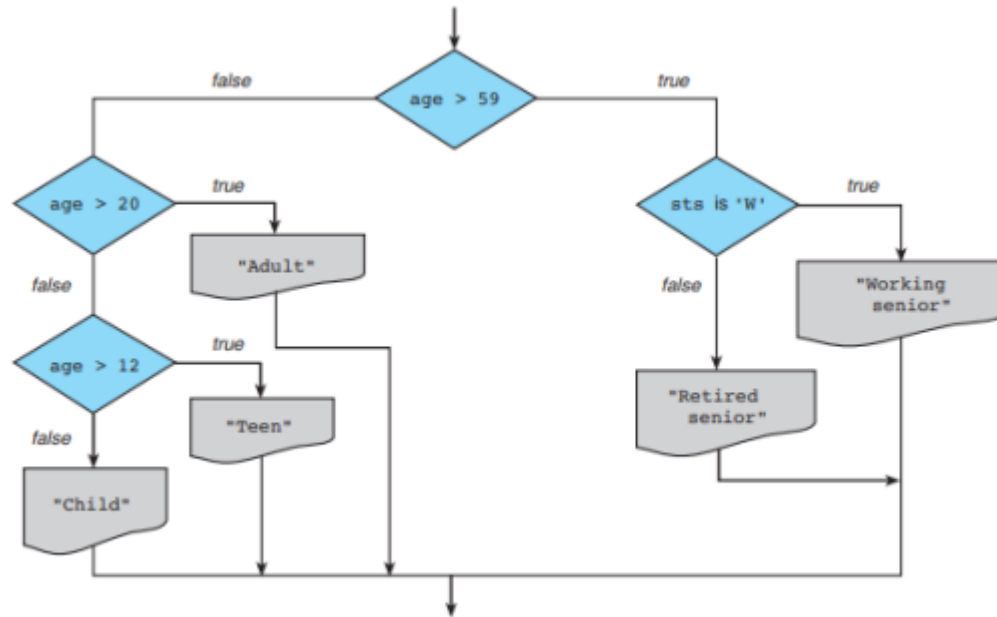


CSE 115, Assignment 1, Due: 31st March, 2023

- 1) If a four-digit number is input through the keyboard, write a program to obtain the sum of the first and last digit of this number.
- 2) Convert Celsius to Fahrenheit unit using the following formula. Take the value of C as input from user and calculate the value of F. $F = C * (9/5) + 32$ [You may not make changes like adding/removing brackets in expression to get accurate result]
- 3) Implement the flow diagram using a nested if structure.



4) Write C Program to calculate the tax from salary using the following table. The formula for tax is: $\text{tax} = (\text{base tax}) + (\text{percentage of excess}) * (\text{salary} - \text{min. salary in the salary range})$. For e.g., if the salary is 32000, then $\text{tax} = 5400 + (22/100) * (32000 - 30000) = 5400 + 440 = 5840$.

Salary Range (\$)	Base Tax (\$)	Percentage of Excess
0.00–14,999.99	0.00	15
15,000.00–29,999.99	2,250.00	18
30,000.00–49,999.99	5,400.00	22
50,000.00–79,999.99	11,000.00	27
80,000.00–150,000.00	21,600.00	33

5) The National Earthquake Information Center has asked you to write a program implementing the following decision table to characterize an earthquake based on its Richter scale number.

Richter Scale Number (n)	Characterization
$n < 5.0$	Little or no damage
$5.0 \leq n < 5.5$	Some damage
$5.5 \leq n < 6.5$	Serious damage: walls may crack or fall
$6.5 \leq n < 7.5$	Disaster: houses and buildings may collapse
higher	Catastrophe: most buildings destroyed

6) Write a program which will use **while** loop to print all the integers between 100 and 200 which are divisible by 8 in descending order.

7) Write a C program to find the **sum of squares** of all **odd numbers** between 1 and 126.

8) A serial transmission line can transmit 960 characters each second. Write a program that will calculate the time required to send a file, given the file's size. Try the program on a 400MB (419,430,400 -byte) file. Use appropriate units. (A 400MB file takes days.)

9) Write a C program that reads the first letter of direction (North, South, East, West), current (x, y) coordinate, and advancement of a person and prints the new coordinate. For e.g., if the current coordinate of a person in XY plane is (2,3) and s/he advances 6 units towards North, then his/her new coordinate is $(2, 3+6) = (2, 9)$.

Sample input/output (bold ones are user inputs):

Enter current coordinate (x and y positions): **2 3**

Enter No. units towards direction: **6**

Enter Direction: **N**

New coordinate: (2,9)

10) Add all integer numbers in an **infinite loop** till **0** is entered. [Hint: you have to use break when 0 is entered, and continue to take input if negative number is given as input]

11) Write a C program that asks a shopper to enter amount (in kg) and total price of sugar he bought from different places. If the shopper mistakenly enters a negative number as amount/price, it prints an error message "Invalid input, enter a positive number" and prompts the shopper to give another input. When the shopper enters 0 as an amount then the program terminates and shows the shopper total amount, price and average price of sugar per kg. [Hint: Use continue within loop statement]

Sample input/output:

Enter amount (in kg): **5**

Enter price: **350**

Enter amount (in kg): **-3**

Invalid input, enter a positive number

Enter amount (in kg): **5**

Enter price: **-67** Invalid input, enter a positive number

Enter amount (in kg): 10
Enter price: 650
Enter amount (in kg): 0
Total amount (in kg): 15,
Total price: 1000,
Average price per kg: 66.67

12) Write a program to compute the series using **while** loop statement: $5^2 + 9^2 + 15^2 + 23^2 + \dots + n^2$

13) Find the sum of the following series up to n terms: $1/2 - 2/3 + 3/4 - 4/5 + 5/6 - \dots$

14) Write a C program to print the sum of this series upto n terms

$$1 + (8^2 + 2)/4^2 + (27^2 + 3)/9^3 + (64^2 + 4)/16^4 + \dots + N$$

15) Write a C program to compute sum of the series: $1/1! + 1/2! + 1/3! + \dots + 1/n!$. n is an input.

16) Write a program to print out all Armstrong numbers between 1 and 500. If sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number. For example, $153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)$

17) Write a C program to compute the sum of digits of an input number and check if this sum is a prime or not.

Sample Input/Output:

Enter any integer: 2821

Sum of its digits = 13. 13 is a prime number.

18) Write a C program to print all palindrome numbers from **m to n** (m, n are inputs). For e.g.

121 is a palindrome since the reverse of 121 = 121; but 152 is not a palindrome. Display also the sum of the palindrome numbers within the range.

19) Write a C program to print the first n palindrome numbers where n is an input.

20) Pattern:

<p>a)</p> <pre> * * * * * * * * * * * * * * * * * * * * * * * * </pre>	<p>b)</p> <pre> * ** *** **** ***** ***** ***** **** *** ** * </pre>	<p>c)</p> <pre> EDCBA DCBA CBA BA A </pre>	<p>d)</p> <table border="1"> <thead> <tr> <th>Sample Input</th> <th>Output</th> </tr> </thead> <tbody> <tr> <td>6</td> <td>1 2 1 3 2 4 1 3 5 2 4 6</td> </tr> </tbody> </table>	Sample Input	Output	6	1 2 1 3 2 4 1 3 5 2 4 6
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