Lab instructions
Week 04

Introduction to Programming
ECS 102, 2018-19 Semester II

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sum_avg_min_max.c

Write a program to calculate and print the sum, average, minimum, and maximum of a set of numbers.

Use a while loop to scan numbers one by one from the user input

Use only one while loop

data_type.c

Write a program on the following.

(a) Print the lengths of all the data types in bits. Use **sizeof**.

(b) Define $\mathrm{a} = 3$ and $\mathrm{b} = 2$ as integers and c as float. Write assignments in different ways to get $\mathrm{c} = \mathrm{a}/\mathrm{b} = 1.5$

(c) Print the character a as integer and explain your answer. Write some other characters as integers e.g., " % \ ' 0 A

(d) Print the integer 97 as character and explain your answer.

(e) Use $\mathrm{a} = 3$ and print $\mathrm{a} \ll 1$ and $\mathrm{a} \gg 1$. Explain your answers.

(f) Use $\mathrm{a} = 3$ and print $\mathrm{b} = ++\mathrm{a}$ and $\mathrm{b} = \mathrm{a}++$. Explain your answers.

(g) Define and integer as **const** and assign it a value later. Compile the program and explain your output.

(h) Create one user-defined data type named **week** for 7 days and print them using printf statement.

expressions.c

Identify unnecessary parentheses, if any in the following arithmetic expressions.

(a) $\big((x - (y/5) + z)\%8\big) + 25$

(b) $\big((x - y) * p)\big) + \mathrm{q}$

(c) $(m * n) + (-x/y)$

(d) $x/(3 * y)$

Verify after writing a program with suitable inputs

sum_series.c

For a set of integers $\mathrm{n} = 1 \ldots N$, print the sum as follows.

$$sum = \sum_{1}^{N} 1/n$$

Compute until 6 digits after decimal point do not change

Use a while loop

euler_number.c

Write a program to compute the value of Euler's number e.

$$e = 1 + \frac{1}{1!} + \frac{1}{2!} + \cdots + \frac{1}{n!}$$

Compute until 12 digits after decimal point do not change

Use a while loop

multiplication_table.c

Write a program to generate the following multiplication table.

```
 1   2   3   4   5   6   7   8   9  10
 2   4   6   8  10  12  14  16  18  20
 3   6   9  12  15  18  21  24  27  30
 4   8  12  16  20  24  28  32  36  40
 5  10  15  20  25  30  35  40  45  50
 6  12  18  24  30  36  42  48  54  60
 7  14  21  28  35  42  49  56  63  70
 8  16  24  32  40  48  56  64  72  80
 9  18  27  36  45  54  63  72  81  90
10  20  30  40  50  60  70  80  90 100
```

Use two nested while loops

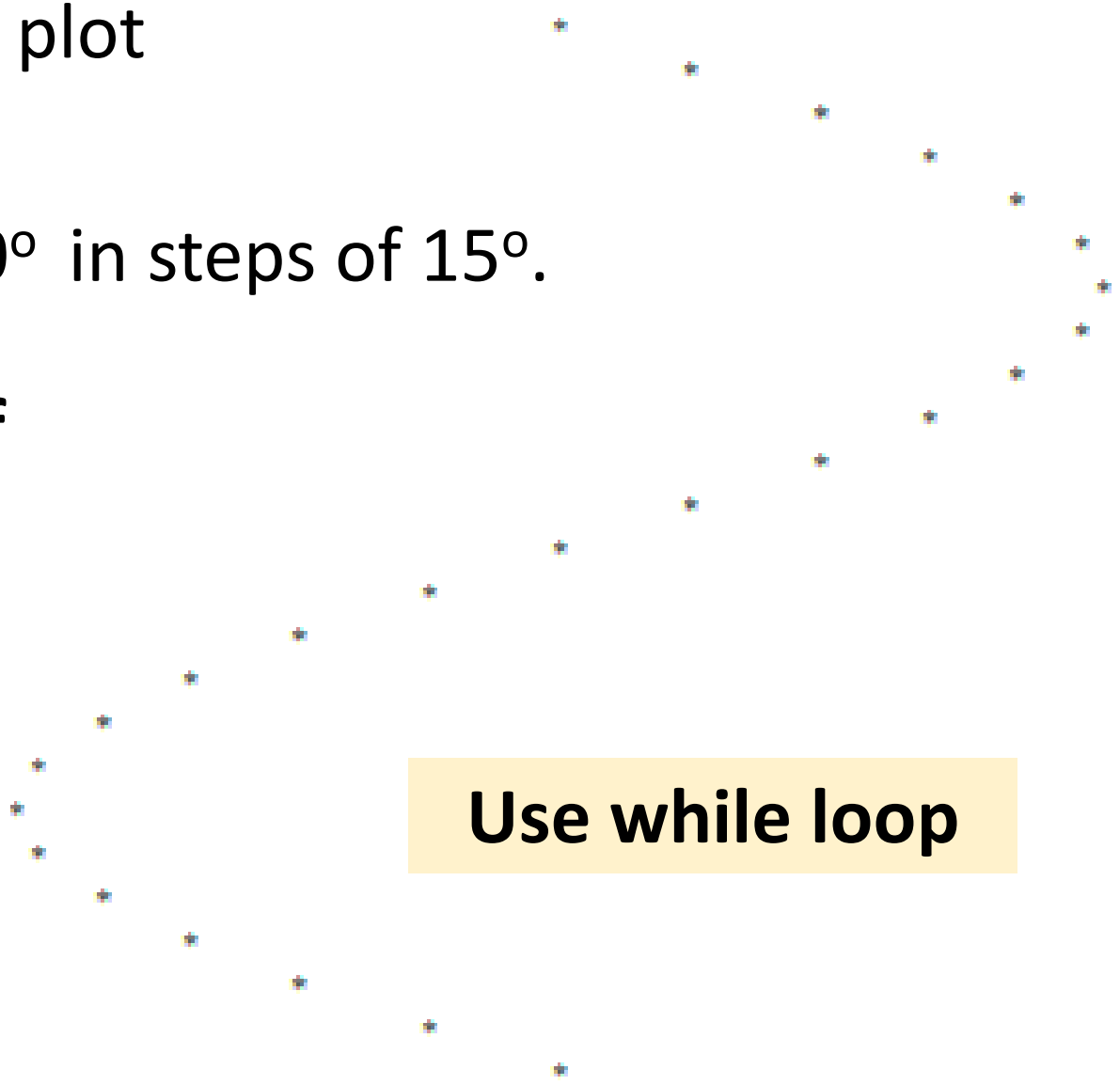
plot_sin.c

Write a program to plot

sin(angle)

for angle = 0 to 360^o in steps of 15^o.

Put "*" using printf statement at the appropriate places programmatically



Use while loop