CS110 - Computational Thinking I
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Intro to Programming

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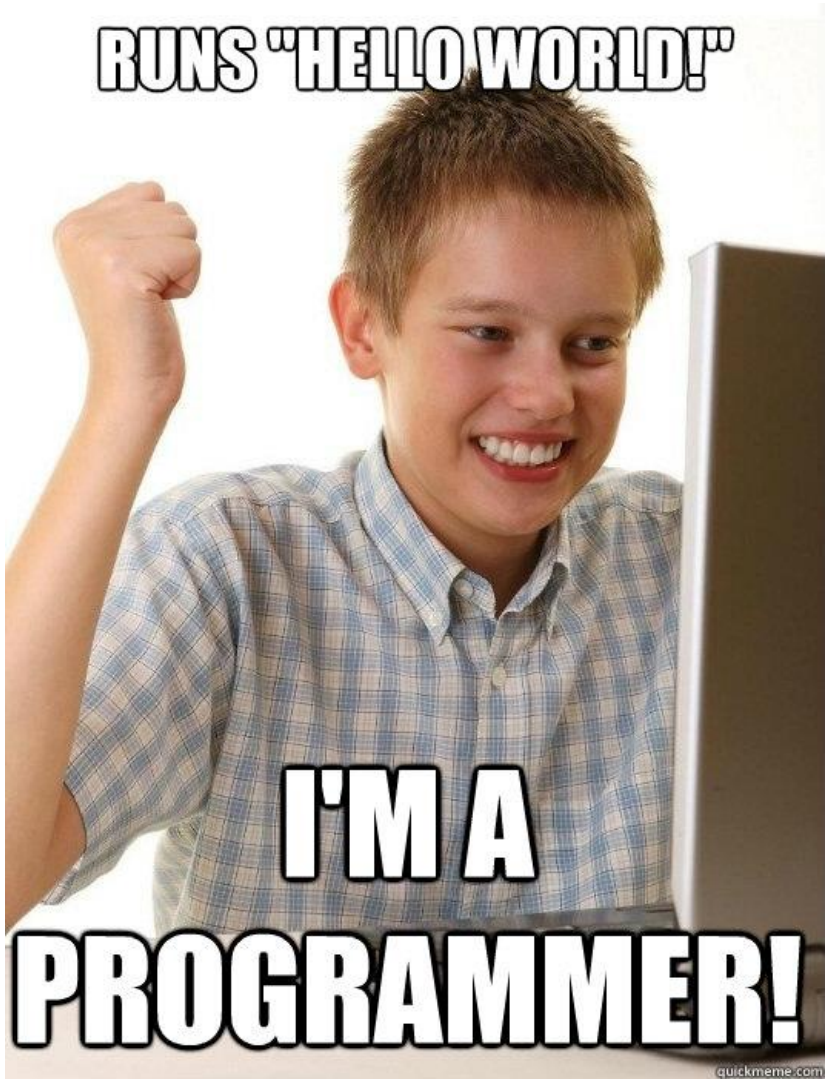
Exercise

- Write a program that prints “Hello World!”.
- Save your program as HelloWorld.py.


RUNS "HELLO WORLD!"
I'M A
PROGRAMMER!
quickmeme.com

Exercises

- Write a program that prints Hello World three times on different lines.

- Write a program that prints your student id, name and discipline on different lines.

Exercise

- Write a program that takes first name and last name as input and print them in concatenated form (firstname + lastname).

Exercises

- Write a program that takes a number as input and prints it.

  Please enter a number: 5
  The number you entered is 5

- Write a program that takes a number as input and prints the square of it.

  Please enter a number: 5
  The square is: 25

- Write a program that takes two numbers as input and prints their sum, difference and product.

  Please enter first number: 14
  Please enter second number: 5
  Sum = 19
  Difference = 9
  Product = 70

Exercise

- Write a program that takes the radius of a sphere as input and outputs its volume. The volume of a sphere with radius r is $\frac{4}{3}\pi r^3$.

Exercise

- Suppose the cover price of a book is 950 Rs, but bookstores get a 20% discount. Shipping costs 100 Rs for the first copy and 50 Rs for each additional copy. Write a program that takes an input the number of copies required and compute the total wholesale cost.

Exercise

- Suppose the cover price of a book is 950 Rs., but bookstores get a 20% discount. Shipping costs 100 Rs. for the first copy and 50 Rs. for each additional copy. Write a program that takes as input the number of copies required and compute the total wholesale cost.
- Modify your program so that now it also takes the cover price and discount rate as inputs and after computation shows the output as follows:

```
**********************************
Cover Price:                    950,
Discount Rate:          20 %
Discounted Price:       760
----------------------------------
Number of Copies :      10
Item(s) Price:          7600  (10 * 760 )
Shipping Cost:          550

Order Price :           8150
**********************************
```

Exercises

- Write a program that takes length (l) and width(w) of a rectangle as input and print its area(l*w) and perimeter (*2*(l+w)*)
- Write a program that takes radius of a circle as input and prints its area (πr^2) and circumference ($2\pi r$).
- If the total selling price of 15 items and the total profit earned on them is input through the keyboard, write a program to find the cost price of one item.

Exercise

- Any integer is input through the keyboard. Write a program to find out whether it is positive, negative or zero.
- Any integer is input through the keyboard. Write a program to find out whether it is an odd number or even number.
- Any year is input through the keyboard. Write a program to determine whether the year is a leap year or not.

Exercise

- Write a program that takes marks of a subject as input and outputs the corresponding grade and grade point as per the following table.

Marks	Grade	GPA
< 50	F	0
50 – 62	D	1
63 – 74	C	2
75 – 87	B	3
> 87	A	4

Exercises

- Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered through the keyboard. A triangle is valid if the sum of all the three angles is equal to 180 degrees.

- If the ages of Saad, Bilal and Adeel are input through the keyboard, write a program to determine the youngest of the three.

Exercise

- A certain grade of steel is graded according to the following conditions:
  a) Hardness must be greater than 50
  b) Carbon content must be less than 0.7
  c) Tensile strength must be greater than 5600
- The grades are as follows:
  - Grade is 10 if all three conditions are met
  - Grade is 9 if conditions (i) and (ii) are met
  - Grade is 8 if conditions (ii) and (iii) are met
  - Grade is 7 if conditions (i) and (iii) are met
  - Grade is 6 if only one condition is met
  - Grade is 5 if none of the conditions are met

Write a program, which will require the user to give values of hardness, carbon content and tensile strength of the steel under consideration and output the grade of the steel.

For Loop

- For Example:
  - Print first 10 odd numbers.
  - Compute factorial of a given number ‘n’.
  - Print table of a given number ‘n’ up to ‘k’.

Exercise – For Loop

- Write a program that prints the following series:
  - 1,2,3,4,5,6,……..100
  - 1,3,5,7,9,11,……..99
  - 2,4,6,8,10,……..,100
  - 100,200,300,400,……..,1000
  - 100,90,80,70,……..,0
  - 1,4,9,16,25,……..100

Exercise – For Loop

- Write a program that takes a number as input and prints its multiplication table (formatted).
- Write a program to draw following patterns:

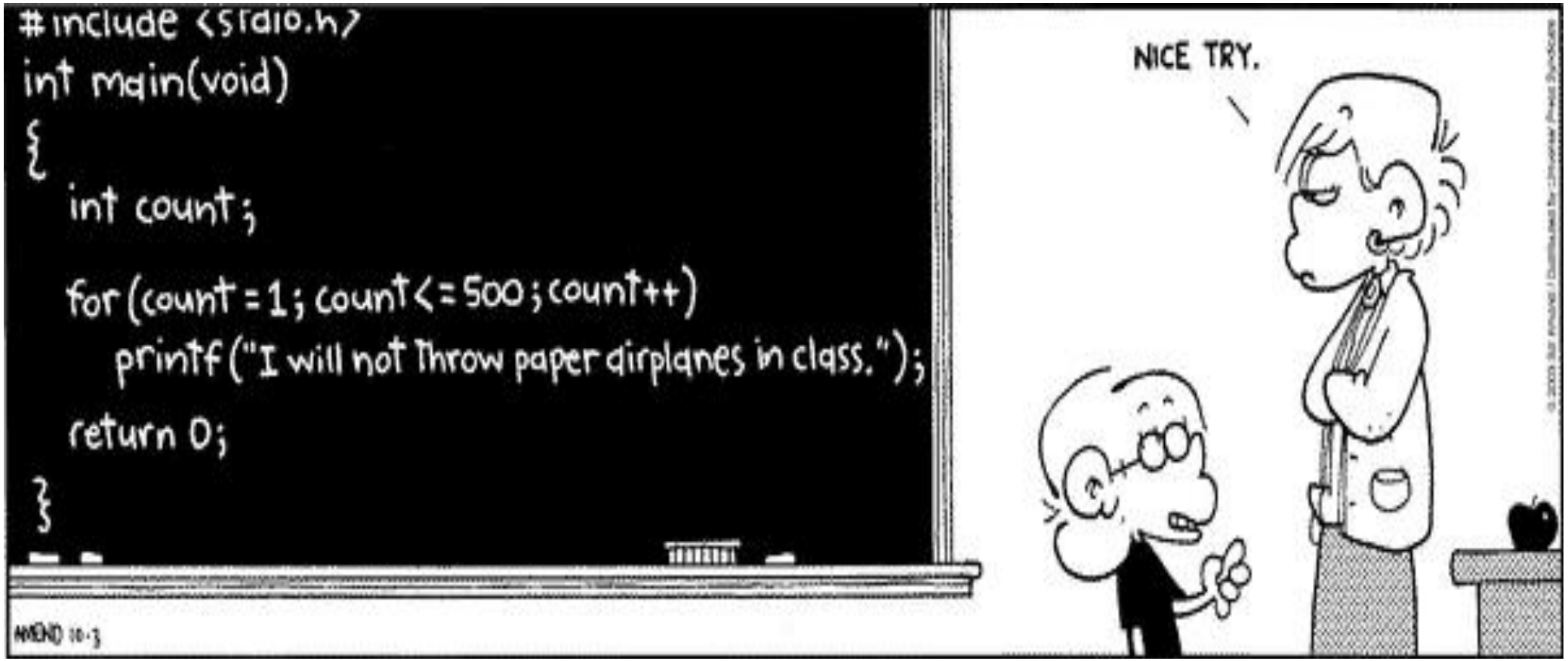
```
*

**

***

****
```

Loops


#include <stdio.h>
int main(void)
{
int count;
for (count = 1; count <= 500; count++)
printf("I will not throw paper airplanes in class.");
return 0;
}
NICE TRY.

Exercise – For Loop

- Two numbers are entered through keyboard. Write a program to find the value of one number raised to the power of another by repeated multiplication.

Exercise – While loop

– Write a program that prompts user to enter a value between 1 and 9. If the user enters an invalid value, the program will give an error and prompt again. The program will keep asking for the input until the user enters a valid value.

Exercise – While Loop

- You have to build a security system that requires a password for login. The security system should allow the user to input a password, and if the password is “login123!\” then the system should display a message saying login successful, otherwise the system should point out that the login attempt was unsuccessful and ask for the password again.

Exercise - Loops

- Write a program CurrencyConverter that asks the user to enter today's exchange rate between U.S. dollars and the PKR. Then the program reads U.S. dollar values and converts it into PKR. Stop when the user enters Q.

  Here is a sample session:

  – How many euros is one dollar? 0.79447
  Dollar value (Q to quit): 100
  100.00 dollar = 79.45 euro
  Dollar value (Q to quit): 20
  20.00 dollar = 15.89 euro
  Dollar value (Q to quit):

Exercises - Loops

- Write a program that takes a number as input and computes its factorial.

- Write a program that repeatedly prints the value of a variable, decreasing it by 0.5 each time, as long as the value remains positive.