Programming Fundamental

Programming Day - Week 04

Introduction

Welcome to your favorite day of the week, programming day��. This week, we shall work together to learn and implement new programming concepts.

Skills to be Tested:

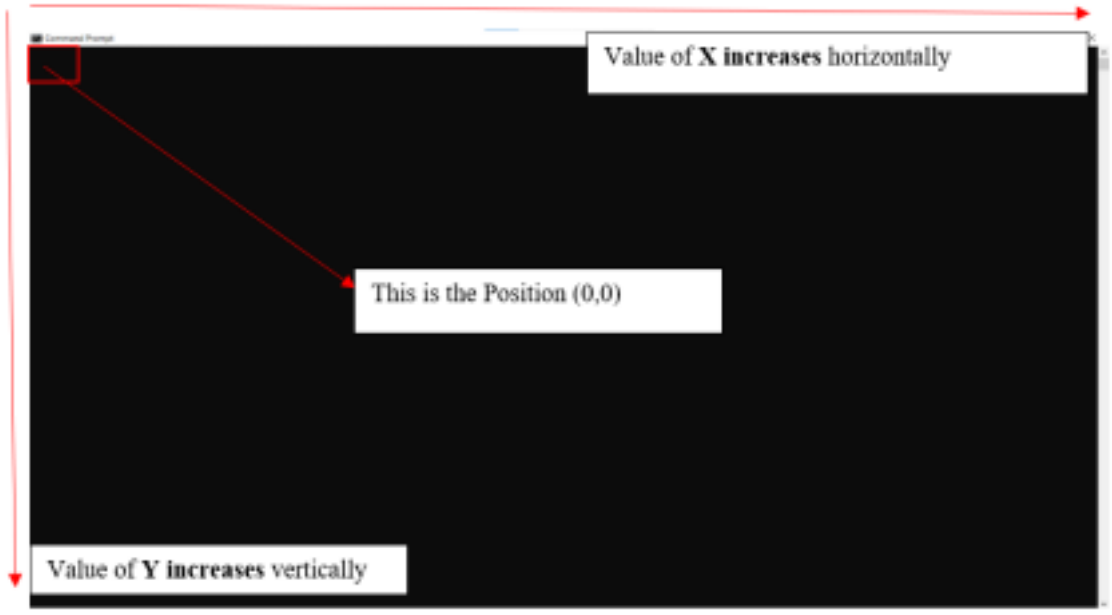
- Learning to use the gotoxy function

Let's do some coding.

Skill: Learning to use the gotoxy function

gotoxy() Function

This function is used to take the cursor from the start of the screen to the given "XY" location. The value of X refers to the **Horizontal Position on the screen** and Y refers to the **Vertical Position of the cursor on the screen**.



Consider the following code snippet to understand the gotoxy() function. **Task 01(WP):** Write a program that prints the test initially and then moves the cursor position to the given XY location on the screen.

Skill: Learning to use the gotoXY function

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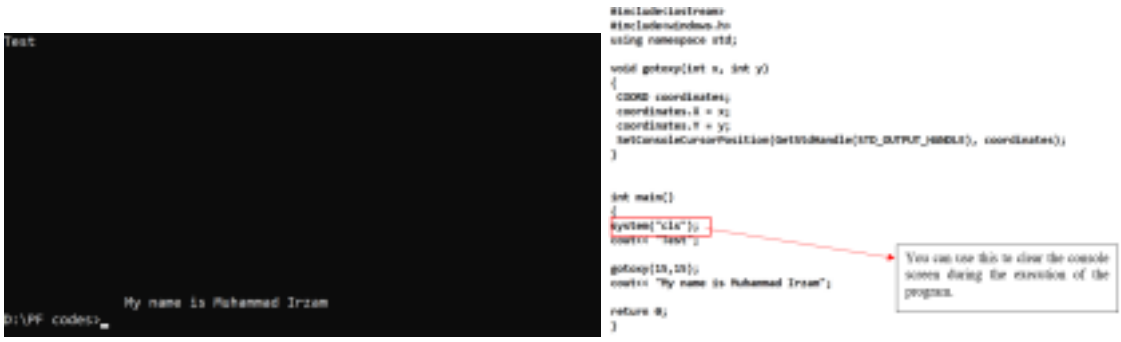
The cursor will move to the position given through the gotoxy() parameter values.



We already know the cls command, now if we want to use it during the execution of the program then we can just pass the command inside the **system(“”).**

Note: The **system()** is a function that requires a parameter that is passed as **cls**. You can use the **system(“cls”)** to clear the screen during the execution of the program.

Let's code it out!

Task 02(CL): Print a maze on the screen after clearing everything else on the console.

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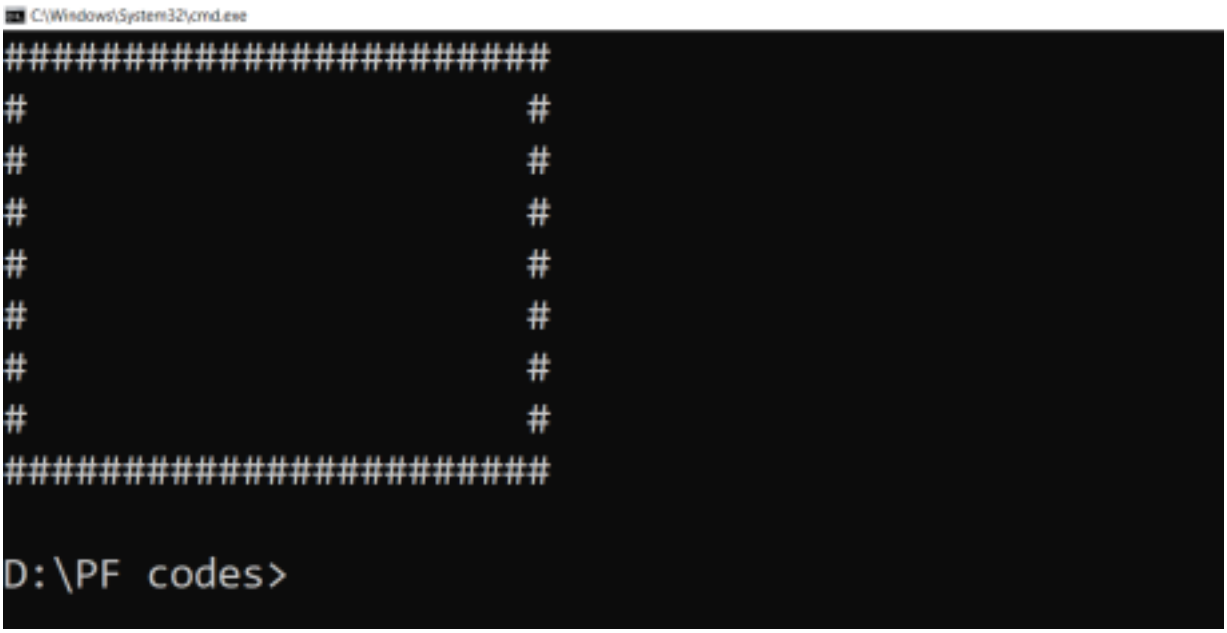

We have used the windows' function **cls** inside our c++ program to print the maze on the screen after clearing the console.
Following is the solution for this output:

```
#include<iostream>
using namespace std;

void gotoxy(int, int);
void printMaze();

main()
{
        system("cls");
        printMaze();
}
void printMaze()
{
    cout << "##########################" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "#                        #" << endl;
    cout << "##########################" << endl;
}
void gotoxy(int x, int y)
{
 COORD coordinates;
 coordinates.X = x;
 coordinates.Y = y;
 SetConsoleCursorPosition(GetStdHandle(STD_OUTPUT_HANDLE), coordinates);
}
```

Function Prototypes

Function Definition to print **Maze**

Function Definition to take cursor to **XY location**

Good Work. You are halfway there.

Skill: Learning to use the gotoXY function

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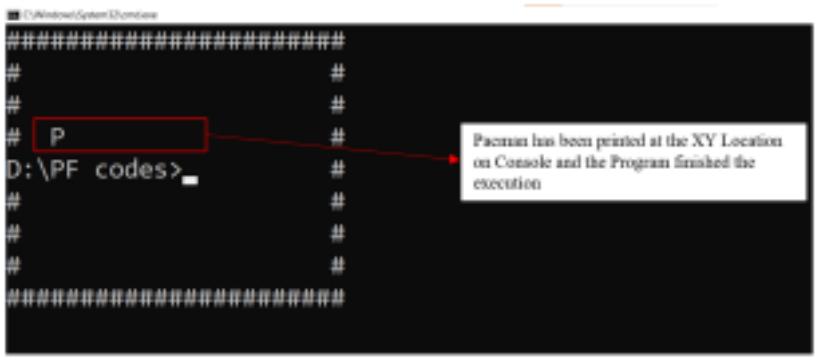
Task 03(CL): Use the gotoxy function to **print** the Player at **some point** in the maze.



Attached is the code snippet for the generated output mentioned above

ning to use the gotoXY function

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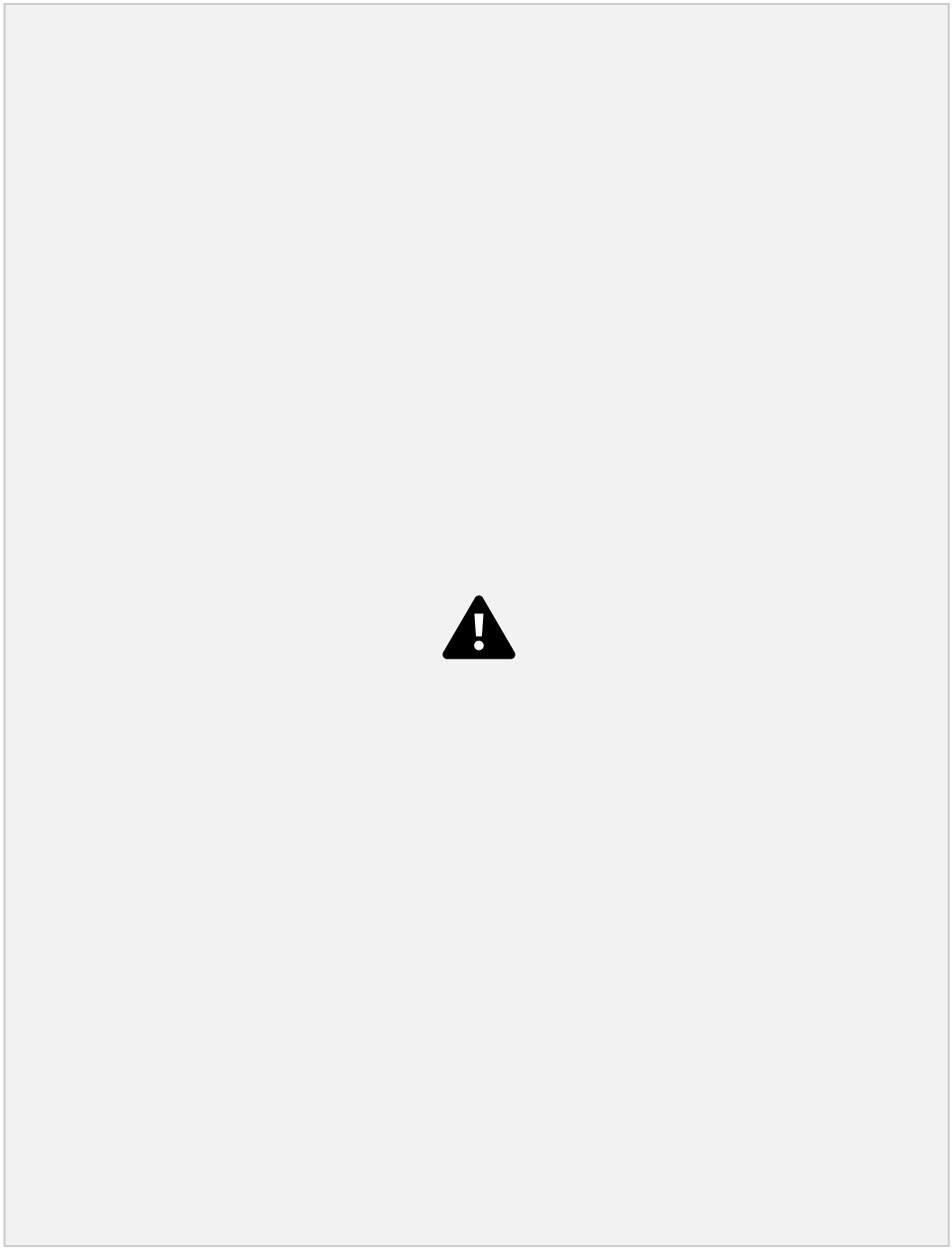

Great work, now you can print the Player at any location inside the maze.

Great work students! Now you can spawn the Player at any location inside the maze using the gotoxy function and you can control that it does not go out from the maze by using the IF Block.
Let’s make Player move diagonally inside the maze on its own by using the learned skills.

Skill: Learning to use the gotoXY function

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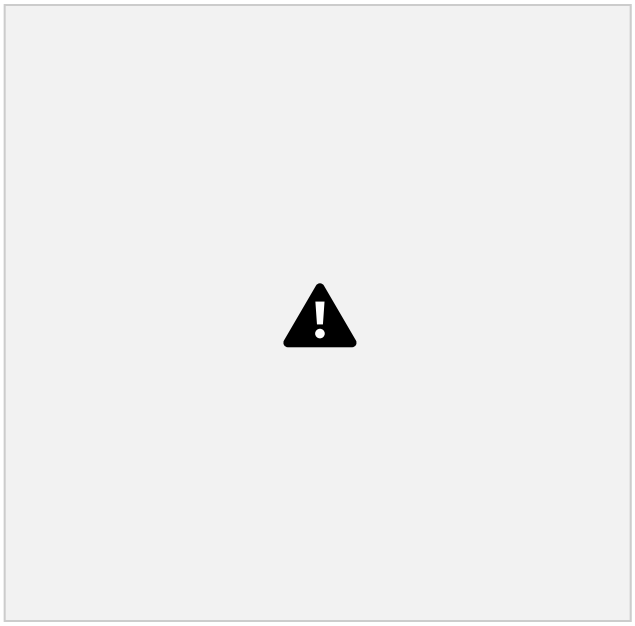
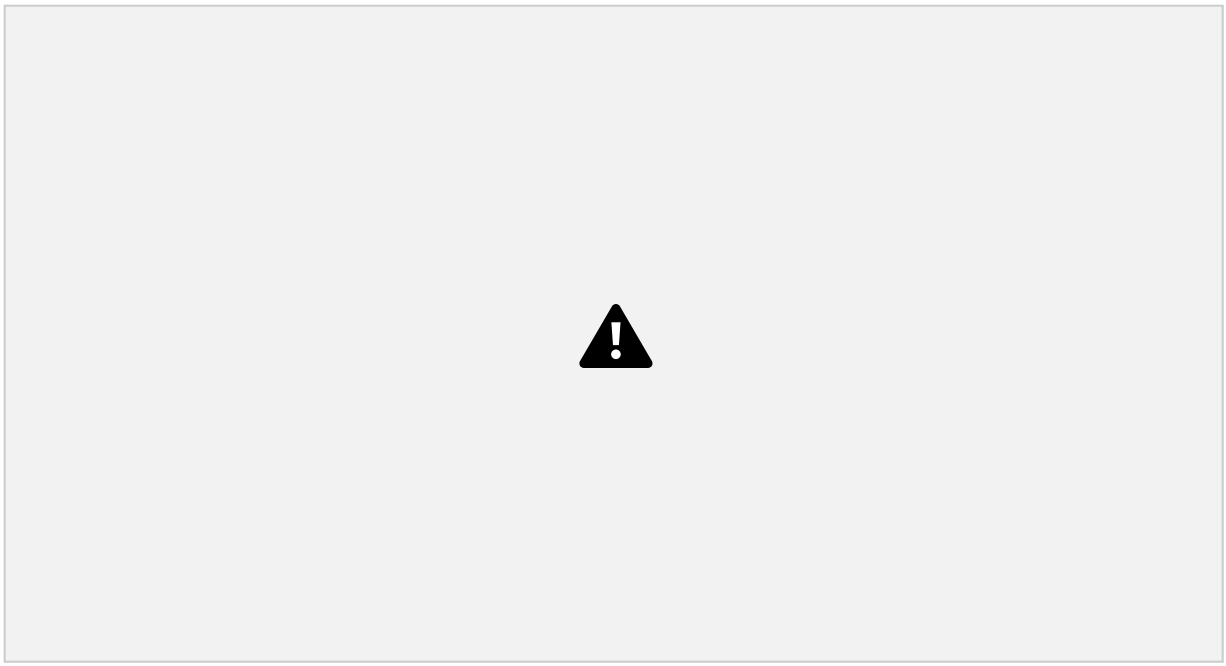
Task 04(CL): Use the **while(true)** to print the Player and move horizontally **indefinitely**.



Attached is a gif file for the output generated by this program.



Great Work !!! You have learned how to make objects move continuously using the gotoxy function, if block, and while

loop.

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Task 05(OP): Write a program that **prints** your name in the **center of the screen** using the **gotoxy** function.

Instruction: Print your name using **Big Alphabets**.

Task 06(OP): Write a program that prints "Hassan" (**Vertically**) on the console screen by using **Big Alphabets**.

Instruction: Define a **separate function** for printing **each Alphabet**. **Task 07(OP):** Write a program to make Player **patrol** (continuously move up and down) **vertically** inside the maze.

Task 08(OP): First Version of UAMS System

Write the c++ program that contains the following functions

- **printMenu()** that prints the main menu for University Admission Management System
  - Menu with the header of the university
- **calculateAggregate(name, matricMarks, interMarks, ecatMarks)** that prints the aggregate on the screen.
  - weightage Matric:30% inter:30% ecat: 40%
  - Total marks Matric:1100 inter:550 ecat: 400
- **compareMarks(nameStd1, ecatMarksStd1, nameStd2, ecatMarksStd2)** ○ Decide the first roll number based on whose marks are maximum after comparing the ecat marks
- Rest of the functionality should be provided in the main() body

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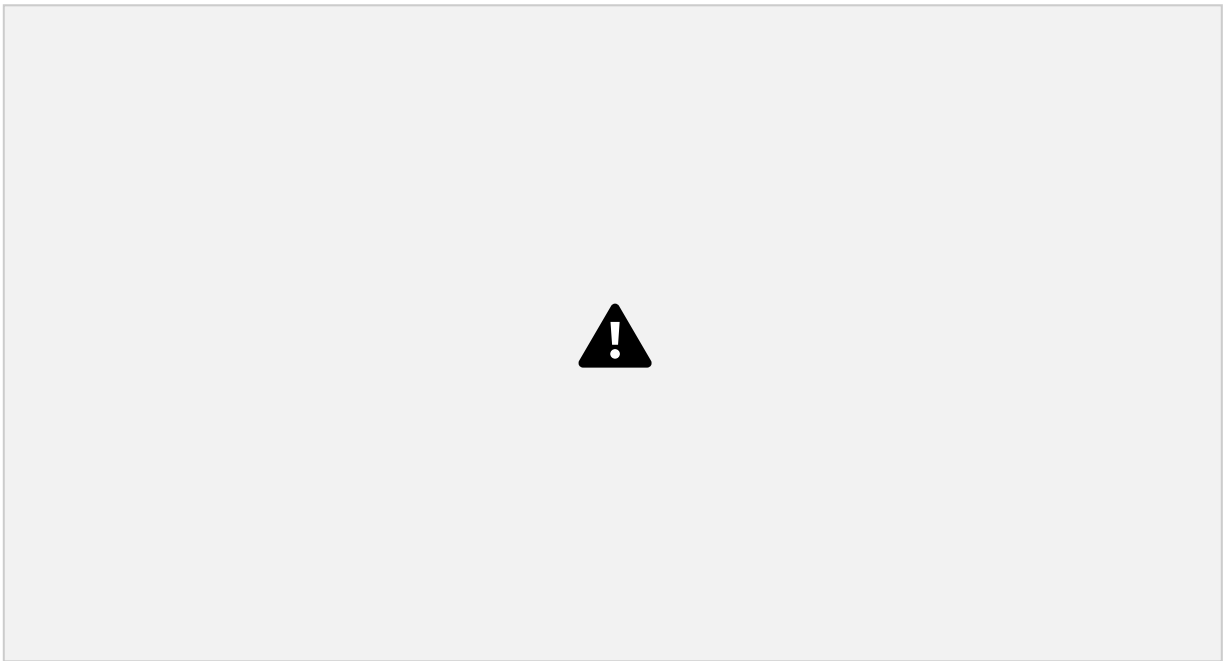
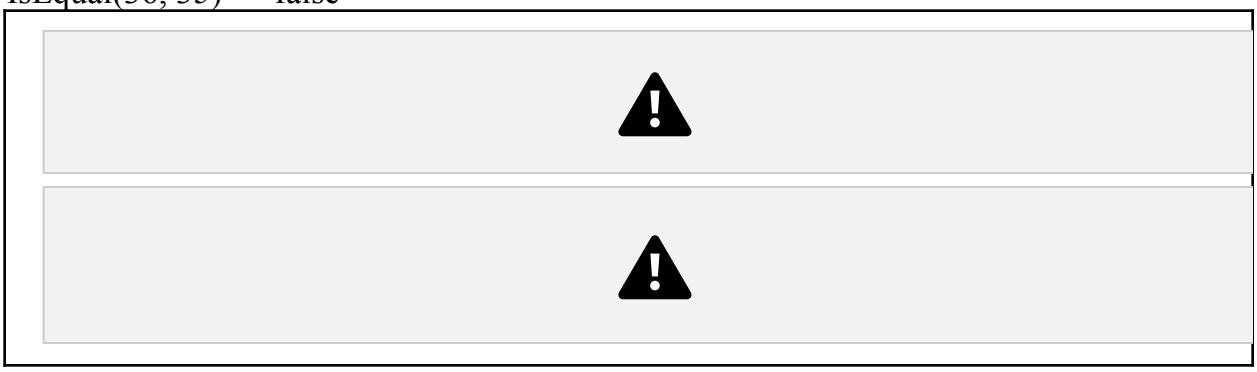


Task 01(CP):

Create a function that takes two integers as parameters and checks if they are equal or not. If they are equal then you should print on the Console “true” otherwise you should print “false” on the console. You should take input from the user in the main function and

then pass that to your function.

Test Cases:
IsEqual(5, 6) ➞ false
IsEqual(1, 1) ➞ true
IsEqual(36, 35) ➞ false



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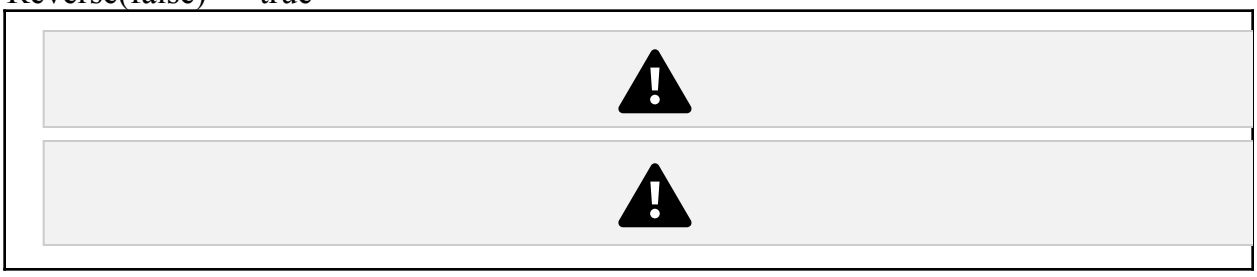
Task 02(CP):
Create a function that changes true to false and false to true. Your function should take input as a string and print false if the input is true. And it should print true if the input is false. You should take input from the user in the main function and then pass that to your function.

Test Cases:
Reverse(true) ➞ false
Reverse(false) ➞ true



Task 3(CP):

Suppose an Airline Company is giving discounts on the following bases:

Pakistan 5%
Ireland 10%
India 20%
England 30%
Canada 45%

Write a function that takes the country's name, the ticket price in dollars, and then displays the final price of the ticket after the discount. You should take input from the user and then pass it to your function.

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Extended Question:
Now make this program run continuously . i.e. it should take input from multiple customers until closed forcefully.

Task 4(CP):
Write a challan issuing program to tell if the car was speeding or not. If the speed is greater than 100 km/h then the car will be challenged, otherwise, the car is following the speed limit. You have to take input speed from the user and then pass it to your function named **checkSpeed(int speed)** and your function should do all the calculations.

Test Cases

Speed: 105	Halt… YOU WILL BE CHALLENGED!!!
Speed: 100	Perfect! You're going good.

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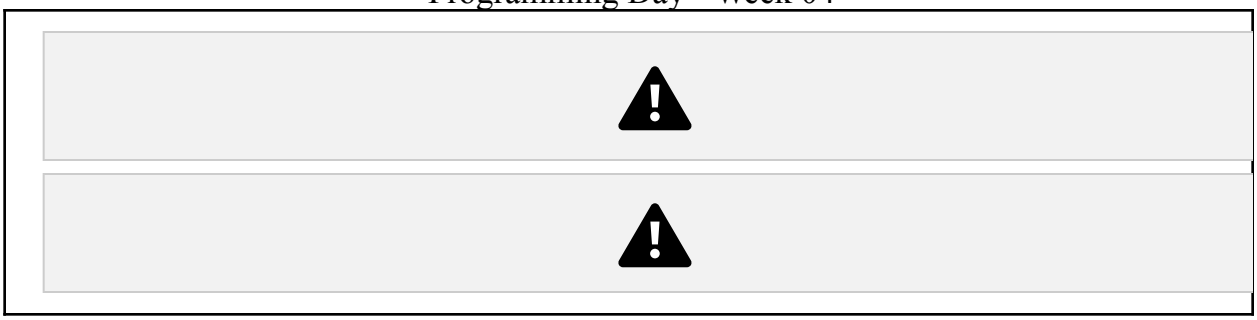


Task 5(CP):
In a board game, a piece may advance 1-6 tiles forward depending on the number rolled

on a six-sided die. If you advance your piece onto the **same tile** as another player's piece, both of you earn a bonus.

Can you reach your friend's tile number in the next roll? Create a function that takes your position `a` and your friend's position `b` and prints a string “true” or “false” of whether it's possible to earn a bonus on any die roll or not.

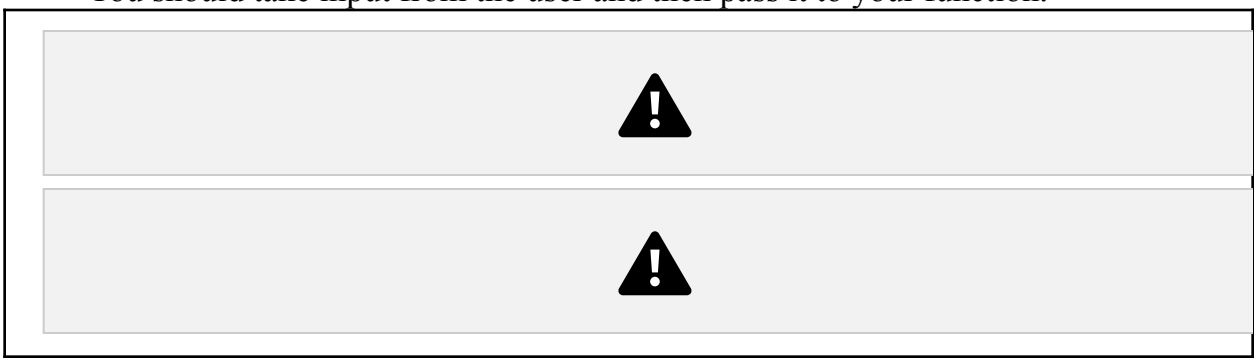
Examples

possibleBonus(3, 7) ➞ true

possibleBonus(1, 9) ➞ false

Notes

- Always assume that you are behind your friend.
- Expect only positive integer inputs.
- You should take input from the user and then pass it to your function.



Task 6(CP):

Create a function that takes two values:

- `h` hours
- `m` minutes

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print the value that's the **longest duration**.

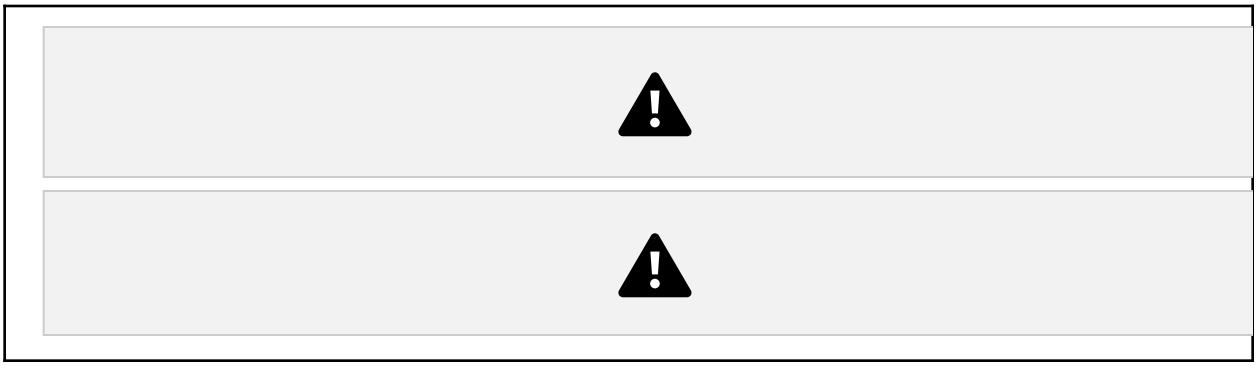
You have to take the value of hour and minute from the user.

Examples

longestTime(1, 59) ➞ 1

longestTime(2, 300) ➞ 300

longestTime(15, 955) ➞ 955



Task 7(CP):

A Flower shop offers three types of flowers. Red Rose, White Rose, and Tulips.

2.00 dollars/pc	4.10 dollars/pc 2.50 dollars/pc

Write a program that takes the number of red roses, white roses, tulips as input from the user, then passes them to a function named **flowerShop(int redRose, int whiteRose, int tulip)** and the function then calculates the total price of the flowers.
If the price is greater than 200$, it gives a 20% discount on the total price and prints the original price and the total payable amount after the discount on the screen. **Test Cases**

Red Rose: 50 White Rose: 20 Tulips: 40	Original Price: 282 Price after Discount: 225.6
Red Rose: 70 White Rose:30 Tulips: 45	Original Price: 375.5 Price after Discount: 300.4

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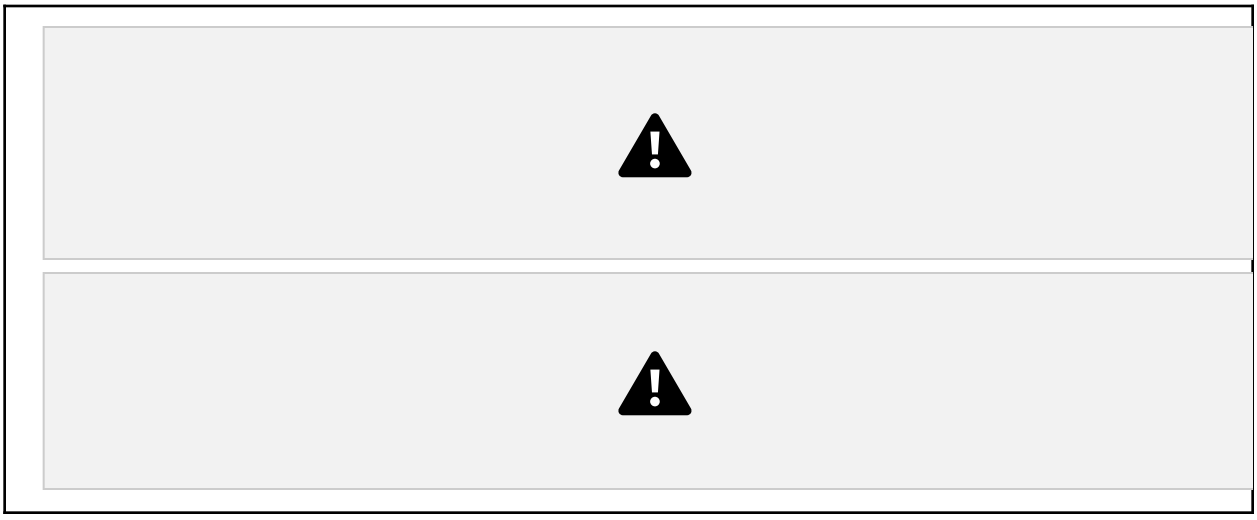

Task 8(CP):

Tom Cat likes to sleep all day, but his owner always plays with him whenever he has free time. To sleep well, the norm of games that Tom has is 30,000 minutes per year. The time for games he has depends on the holidays that his owner has.

Working Days 63 Minutes per day
Holidays 127 Minutes per day

Write a program that reads the number of holidays and passes it to the function named **pet(int holidays)** and the function then prints whether Tom can sleep well and how much the difference from the current year's norm. It is assumed that there are 365 days in one year.

Example: 20 holidays.
The working days are 345 (365 - 20 = 345).
The time for games is 24,275 minutes (345 * 63 + 20 * 127).
The difference from the norm is 5,725 minutes (30,000 – 24,275 = 5,725) or 95 hours and 25 minutes.

Test Cases

Holidays: 20 Tom sleeps well 95 hours and 25 minutes less for play
Holiday: 113 Tom will run away

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3 hours and 47 minutes for play

Task 9(CP):

In COVID you have to stay home for 14 days at any given time. Do you have enough Tissue Papers to make it through?

Although the number of squares per roll of TP varies significantly, we'll assume each roll has 500 sheets, and the average person uses 57 sheets per day.

Create a function that will receive two parameters:

- `people` — Number of people in the household.
- `tp` — Number of rolls.

print a statement telling the user if they need to buy more TP!

Examples

tpChecker(4, 1) ➞ "Your TP will only last 2 days, buy more!"

tpChecker(3, 20) ➞ "Your TP will last 58 days, no need to panic!"

tpChecker(4, 12) ➞ "Your TP will last 26 days, no need to panic!"

You should take input from the user and then pass it to your function.

ning to use the gotoXY function

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Good Luck and Best Wishes !!

Happy Coding ahead :)

Skill: Learning to use the gotoXY function