GKTCS INNOVATIONS

Control Structure

Conditional Statements (Decision Making)

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- Python language provide the following conditional (Decision making) statements.

If statements

Else statements

Elif statements

Nested if statements

If Statement

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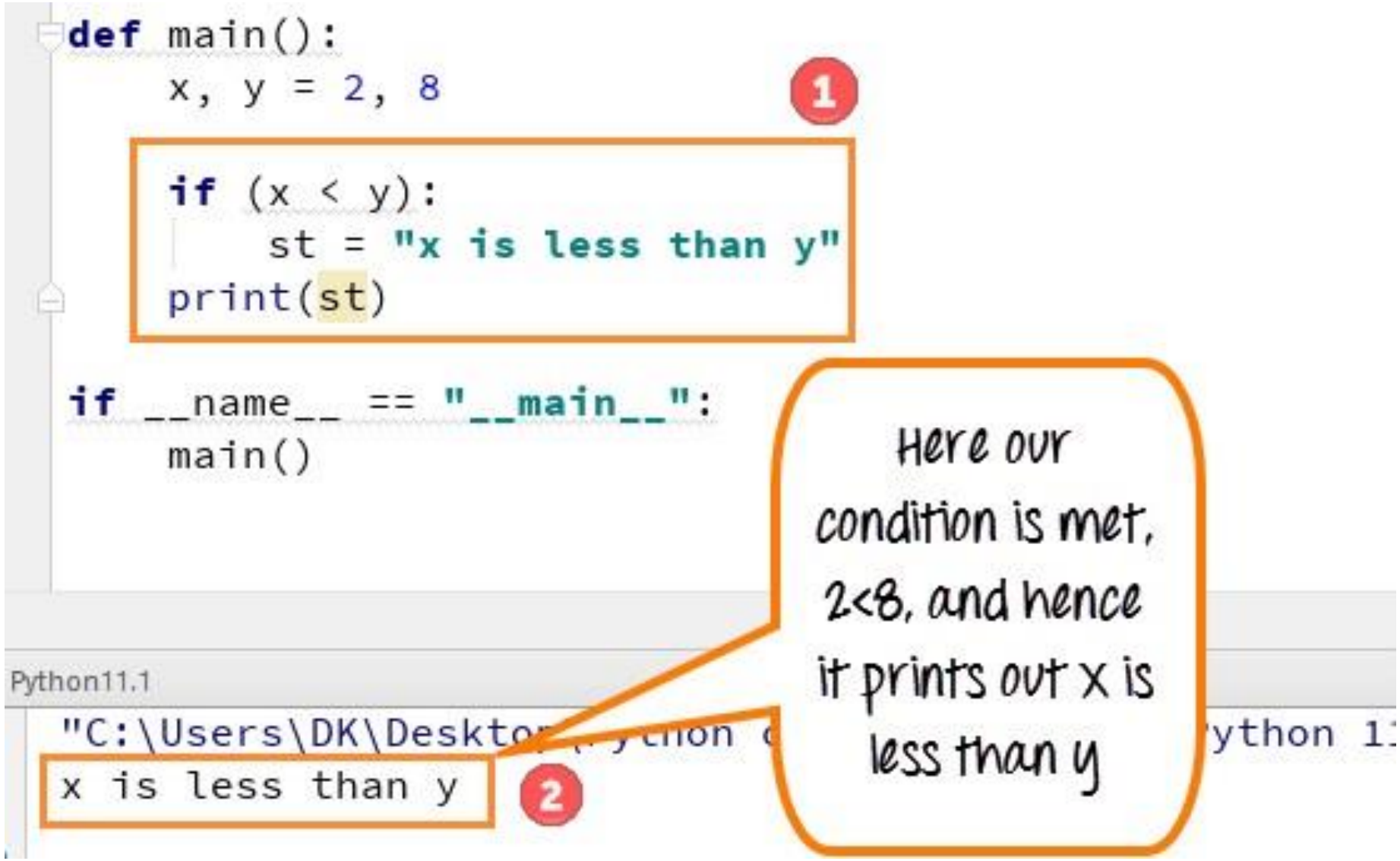
- In Python, If Statement is used for decision making.
- It will run the body of code only when IF statement is true.
- When you want to justify one condition while the other condition is not true, then you use "if statement".

Syntax:

```
if expression
    Statement
else
    Statement
```

Let see an **example-**



What happen when "if condition" does not meet

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- In this step, we will see what happens when your "if condition" does not meet.

Python11.1.py

```
1   #
2   # Example file for working with conditional statement
3   #
4   def main():
5       x, y = 8, 4
6
7       if (x < y):
8           st = "x is less than y"
9       print(st)
10
11  if __name__ == "__main__":
12      main()
13
14
```

It shows the error because it does not match our "if condition" (i.e x<y)

Run Python11.1

```
"C:\Users\DK\Desktop\Python code\Python Test\Python 11\PythonCode11\venv\S
Traceback (most recent call last):
  File "C:/Python Code/PythonCode11/Python11.1.py", line 12, in <module>
    main()
  File "C:/Python Code/PythonCode11/Python11.1.py", line 9, in main
    print(st)
UnboundLocalError: local variable 'st' referenced before assignment
```

- Code Line 5: We define two variables x, y = 8, 4
- Code Line 7: The if Statement checks for condition x<y which is **False** in this case
- Code Line 8: The variable st is **NOT** set to "x is less than y."
- Code Line 9: The line print st - is trying to print the value of a variable that was never declared. Hence, we get an error.

How to use "else statement"

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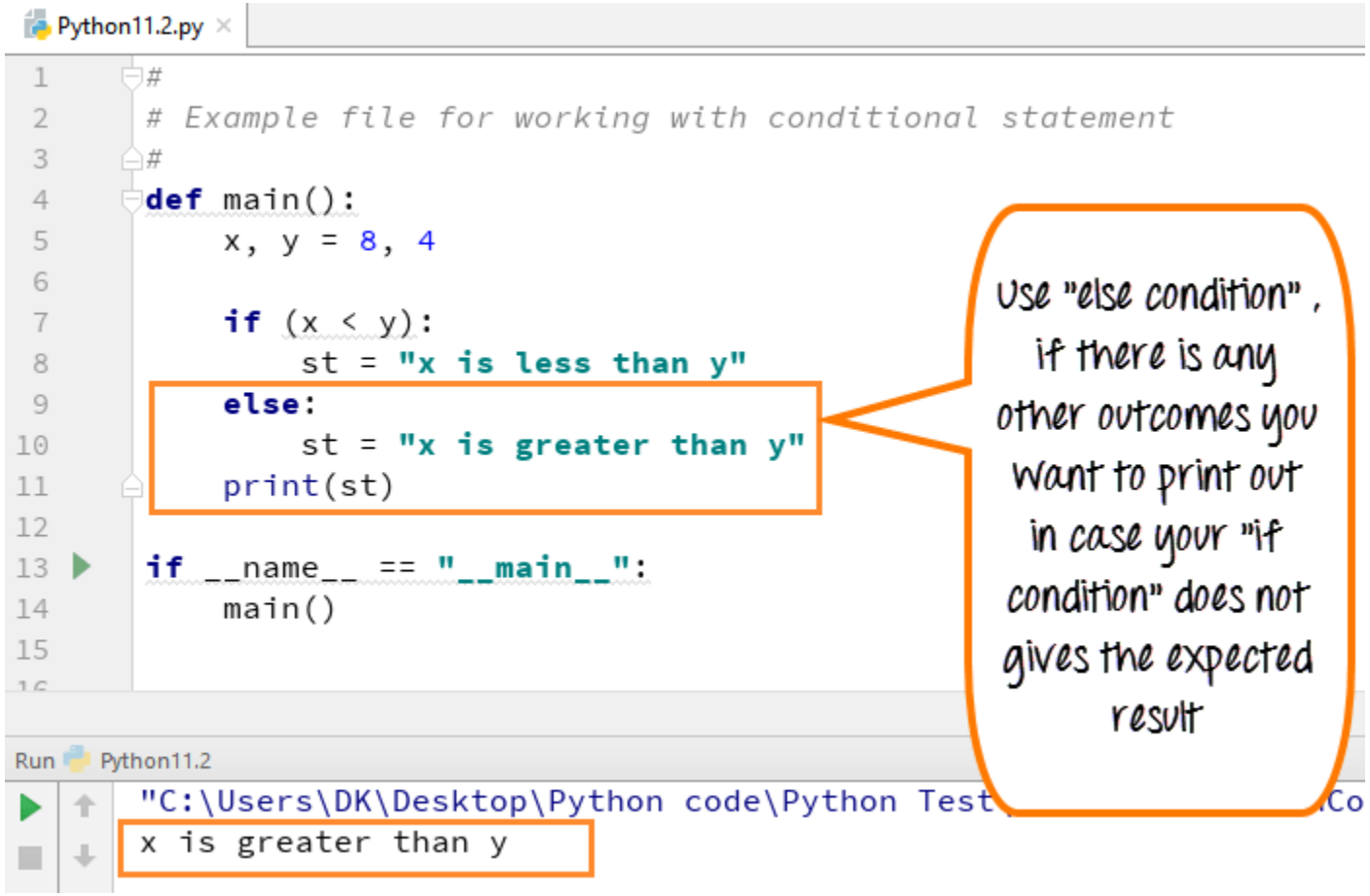
- The "else statement" is usually used when you have to judge one statement on the basis of other.
- If one condition goes wrong, then there should be another condition that should justify the statement or logic.



- Code Line 5: We define two variables x, y = 8, 4
- Code Line 7: The if Statement checks for condition x<y which is **False** in this case
- Code Line 9: The flow of program control goes to else condition
- Code Line 10: The variable st is set to "x is **greater** than y."
- Code Line 11: The line print st will output the value of variable st which is "x is greater than y"

When "else condition" does not work

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- There might be many instances when your "else condition" won't give you the desired result.
- It will print out the wrong result as there is a mistake in program logic.
- In most cases, this happens when you have to justify more than two statement or condition in a program.

Python11.3.py

```
1   #
2   # Example file for working with conditional statement
3   #
4   def main():
5       x, y = 8, 8
6
7       if (x < y):
8           st = "x is less than y"
9       else:
10          st = "x is greater than y"
11      print(st)
12
13
14  if __name__ == "__main__":
15      main()
```

Oops ! .... Now both #numbers over here are same, still it prints out "x is greater than y"

Run Python11.2

```
"C:\Users\DK\Desktop\Python  \Python Test\Python 11\Pyt
x is greater than y
```

How to use "elif" statement

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- To correct the previous error made by "else condition", we can use **"elif"** statement.
- By using "**elif**" condition, you are telling the program to print out the third condition or possibility when the other condition goes wrong or incorrect.

Python11.3.py

```
1   #
2   # Example file for working with conditional statement
3   #
4   def main():
5       x, y = 8, 8
6
7       if (x < y):
8           st = "x is less than y"
9
10      elif (x == y):
11          st = "x is same as y"
12
13      else:
14          st = "x is greater than y"
15      print(st)
16
17
18  if __name__ == "__main__":
19      main()
20
```

Run Python11.3

```
"C:\Users\DK\Desktop ython
x is same as y
```

When both co-ordinates(8,8) are same we have used "elif condition" to print out, "x is same as y"

- Code Line 5: We define two variables x, y = 8, 8
- Code Line 7: The if Statement checks for condition x<y which is **False** in this case
- Code Line 10: The flow of program control goes to the elseif condition. It checks whether x==y which is true
- Code Line 11: The variable st is set to "x is **same as** y."
- Code Line 15: The **flow of program control exits the if Statement (it will not get to the else Statement).**
- And print the variable st. The output is "x is same as y" which is correct

How to execute conditional statement with minimal code

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Syntax:

A If B else C

Example:

```
1   def main():
2       x, y = 10, 8
3       st = "x is less than y" if (x < y) else "x is greater than or equal to y"
4       print(st)
5
6   if __name__ == "__main__":
7       main()
8
9
10
11
```

Python gives freedom to use minimal code to execute your conditional statement

```
Run  Python11.4
"C:\Users\DK\Desktop\Python code\Python Test\Python 11\PythonCode11\venv\Scripts\py
x is greater than or equal to y
```

- Code Line 2: We define two variables x, y = 10, 8
- Code Line 3: Variable st is set to "x is less than y "if x<y or else it is set to "x is greater than or equal to y".
- In this x>y variable st is set to **"x is greater than or equal to y."**
- Code Line 4: Prints the value of st and gives the correct output

Nested If Statement

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When there is an if statement (or if..else or if..elif..else) is present inside another if statement (or if..else or if..elif..else) then this is calling the **nesting of control statements**.

Here we have a if statement inside another if..else statement block. Nesting control statements makes us to check multiple conditions.

```
num = -99
if num > 0
        print(“positive number”)
else:
        print(“negative number”)
if -99<=num:
        print(“two digit negative number”)
```

Output:

```
negative number
two digit negative number
```