Python I

HIGHER DIPLOMA IN DATA ANALYTICS

Database vs program

Employee ID	Name	Dept	Salary
100	John	HR	25500
101	Mary	R&D	44500
102	Bill	R&D	43000
103	Tom	Sales	40000

Database vs program

Employee ID	Name	Dept	Salary
100	John	HR	25500
101	Mary	R&D	44500
102	Bill	R&D	43000
103	Tom	Sales	40000

```
SELECT * FROM employees
WHERE Salary > 42000;
```

Database vs program

Employee ID	Name	Dept	Salary
100	John	HR	25500
101	Mary	R&D	44500
102	Bill	R&D	43000
103	Tom	Sales	40000

```
SELECT * FROM employees
WHERE Salary > 42000;
```

```
SELECT * FROM employees
WHERE Salary < 30000;
```

Variables

- Variables are named areas in the computer's memory that store values.

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```
my1stVariable = "Hello World"
```

Variables

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```
my1stVariable = "Hello World"

print(my1stVariable)
```

Variables

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```
my1stVariable = "Hello World"

print(my1stVariable)
```

Hello World

Variables

- Variables are named areas in the computer's memory that store values.

```
my1stVariable = "Hello World"
```

```
my2ndVariable = 1
```

```
print(my1stVariable)
```

Hello World

Variables

- Variables are named areas in the computer's memory that store values.

```
my1stVariable = "Hello World"

print(my1stVariable)
```

Hello World

```
my2ndVariable = 1

my2ndVariable + 4
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my1stVariable = "Hello World"

print(my1stVariable)
```

Hello World

```
my2ndVariable = 1

my2ndVariable + 4

print(my2ndVariable)
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my1stVariable = "Hello World"

print(my1stVariable)
```

Hello World

```
my2ndVariable = 1

my2ndVariable + 4

print(my2ndVariable)
```

1

Variables

- Variables are named areas in the computer's memory that store values.

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
```

1

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
print(x)
```

1

5

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
print(x)
```

1

5

```
age = 21
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
```

1

```
print(x)
```

5

```
age = 21

age = age + 1
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
print(x)
```

1

5

```
age = 21

age = age + 1

print(age)
```

Variables

- Variables are named areas in the computer's memory that store values.

```
my2ndVariable = 1

x = my2ndVariable + 4

print(my2ndVariable)
print(x)
```

1

5

```
age = 21

age = age + 1

print(age)
```

22

IF statements

IF statements

```
age = 17
```

IF statements

```
age = 17

if (age > 17):
    print("OK")
```

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

Finished

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

Finished

```
age = 17

if (age > 17):
    print("OK")
elif (age < 18):
    print("NOK")
print("Finished")
```

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

Finished

```
age = 17

if (age > 17):
    print("OK")
elif (age < 18):
    print("NOK")
print("Finished")
```

NOK
Finished

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

Finished

```
age = 17

if (age > 17):
    print("OK")
elif (age < 18):
    print("NOK")
print("Finished")
```

NOK
Finished

```
temp = 37

if (temp > 37):
    print("Hot")
elif (temp < 37):
    print("Cold")
else:
    print("OK")
print("Finished")
```

IF statements

```
age = 17

if (age > 17):
    print("OK")

print("Finished")
```

Finished

```
age = 17

if (age > 17):
    print("OK")
elif (age < 18):
    print("NOK")
print("Finished")
```

NOK
Finished

```
temp = 37

if (temp > 37):
    print("Hot")
elif (temp < 37):
    print("Cold")
else:
    print("OK")
print("Finished")
```

OK
Finished

input

input

```
name = input("Enter name")
```

input

```
name = input("Enter name")
```

Enter name **Tom**

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

```
salary = input("Enter salary")
```

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

```
salary = input("Enter salary")
```

Enter salary
30000

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

```
salary = input("Enter salary")

salary = salary + 100

print(salary)
```

Enter salary
30000

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

```
salary = input("Enter salary")

salary = salary + 100

print(salary)
```

Enter salary **30000**

TypeError: can only concatenate str (not "int") to str

input

```
name = input("Enter name")

email = name + "@gmit.ie"

print(email)
```

Enter name **Tom**

Tom@gmit.ie

```
salary = input("Enter salary")
salary = int(salary)
salary = salary + 100

print(salary)
```

Enter salary **30000**

TypeError: can only concatenate str (not "int") to str

WHILE statement

WHILE statement

```
i = 1


while (i <= 5):
    print(i)
    i += 1
```

```
1
2
3
4
5
```

WHILE statement

```
i = 1


while (i <= 5):
    print(i)
    i += 1
   # i = i + 1
```

```
1
2
3
4
5
```

WHILE statement

```
i = 1


while (i <= 5):
    print(i)
    i += 1
    # i = i + 1
```

```
1
2
3
4
5
```

```
answer = "5";

while True:
    guess = input("Pick a number between 1 & 10")
    if (guess == answer):
        print("Correct!")
        break;

print("End")
```

ARRAYS

ARRAYS

```
myArr = ["Jan", "Feb", "March", "April"]
```

ARRAYS

```
myArr = ["Jan", "Feb", "March", "April"]

print(myArr)
```

['Jan', 'Feb', 'March', 'April']

ARRAYS

```
myArr = ["Jan", "Feb", "March", "April"]

print(myArr)
```

['Jan', 'Feb', 'March', 'April']

```
print(myArr[0])
```

Jan

ARRAYS

```
myArr = ["Jan", "Feb", "March", "April"]
```

```
print(myArr)
```

['Jan', 'Feb', 'March', 'April']

```
print(myArr[0])
```

Jan

```
print(len(myArr))
```

4

append()

```
myArr = ["Jan", "Feb", "March", "April"]
```

append()

```
myArr = ["Jan", "Feb", "March", "April"]

myArr.append("May")


print(myArr)
```

['Jan', 'Feb', 'March', 'April', 'May']

append()

```
myArr = ["Jan", "Feb", "March", "April"]

myArr.append("May")

myArr  = myArr.append("May")

print(myArr)
```

['Jan', 'Feb', 'March', 'April', 'May']

FOR statement

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

```
Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

```
Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie
```

```
myArr = [1, 5, 12]
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie

```
myArr = [1, 5, 12]

for x in myArr:
    print(x+1)
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

```
Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie
```

```
myArr = [1, 5, 12]

for x in myArr:
    print(x+1)
```

```
2
6
13
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

```
Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie
```

```
myArr = [1, 5, 12]

for x in myArr:
    print(x+1)

print(myArr)
```

```
2
6
13
```

FOR statement

```
names = ["Tom", "John", "Mary", "Bob"]

for name in names:
    print (name+"@gmit.ie")
```

```
Tom@gmit.ie
John@gmit.ie
Mary@gmit.ie
Bob@gmit.ie
```

```
myArr = [1, 5, 12]

for x in myArr:
    print(x+1)
```

```
2
6
13
```

```
print(myArr)
```

```
[1, 5, 12]
```

User-defined functions

User-defined functions

```
def printMonths():
    print("Jan, Feb, Mar")
```

User-defined functions

```
def printMonths():
    print("Jan, Feb, Mar")
```

```
printMonths()
```

Jan, Feb, Mar

User-defined functions

```
def printMonths():
    print("Jan, Feb, Mar")


def printDays():
    print("Mon, Tue, Wed")



printMonths()
```

Jan, Feb, Mar

User-defined functions

```
def printMonths():
    print("Jan, Feb, Mar")


def printDays():
    print("Mon, Tue, Wed")


printDays()
printMonths()
```

Mon, Tue, Wed

Jan, Feb, Mar

__name__

```
def printMonths():
    print("Jan, Feb, Mar")

def main():
    printMonths()
```

__name__

```
def printMonths():
    print("Jan, Feb, Mar")

def main():
    printMonths()

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

__name__

```
def printMonths():
    print("Jan, Feb, Mar")

def main():
    printMonths()

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Jan, Feb, Mar

Parameters

Parameters

```
print("Hello World")
```

Parameters

```
print("Hello World")
```

Hello World

Parameters

```
print("Hello World")
```

Hello World

```
print("Test")
```

Test

Parameters

```
print("Hello World")
```

Hello World

```
print("Test")
```

Test

```
s = "This is a String"

print(len(s))
```

16

Parameters

```
print("Hello World")
```

Hello World

```
print("Test")
```

Test

```
s = "This is a String"

print(len(s))
```

16

```
s = "This is a String"

x = len(s)

print(x)
```

16

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name: Tom

Enter Age:

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22

Parameters

```
def checkAge(age):
    if age < 18:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age))

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Enter Name:	Tom
Enter Age:	22
Tom is Accepted	

Local Variables

```
def checkAge(age):
     limit = 18
     if age < limit:
          return "Too Young"
     return "Accepted"

def main():
     name = input("Enter Name:" )
     age = int(input("Enter Age: "))
     print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
     # execute only if run as a script
     main()
```

Local Variables

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Local Variables

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Local Variables

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    limit = "Finished"
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Local Variables

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

```
def checkAge(age):
    limit = 18
    if age < limit:
        return "Too Young"
    return "Accepted"

def main():
    limit = "Finished"
    name = input("Enter Name:" )
    age = int(input("Enter Age: "))
    print(name, "is", checkAge(age), limit)

if __name__ == "__main__":
    # execute only if run as a script
    main()
```

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)



def main():
     age = 24
     incrementAge(age)
     print(age)



if __name__ == "__main__":
     # execute only if run as a script
     main()
```

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)



def main():
     age = 24
     incrementAge(age)
     print(age)



if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

```
age = 24

def incrementAge():
     global age
     age += 1
     print(age)


def main():
     incrementAge()
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

```
age = 24

def incrementAge():
     global age
     age += 1
     print(age)


def main():
     incrementAge()
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

```
age = 24

def incrementAge():
     global age
     age += 1
     print(age)


def main():
     incrementAge()
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

```
age = 24

def incrementAge():
     global age
     age += 1
     print(age)


def main():
     incrementAge()
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

Global Variables

```
def incrementAge(age):
     age += 1
     print(age)


def main():
     age = 24
     incrementAge(age)
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

24

```
age = 24

def incrementAge():
     global age
     age += 1
     print(age)


def main():
     incrementAge()
     print(age)


if __name__ == "__main__":
     # execute only if run as a script
     main()
```

25

25