

Infosys Certification Program

Description

Infosys Certification Program aims at enabling and certifying fresh engineering graduates on basic set of courses created by Infosys Ltd required to play the role of an IT professional. Participants would be enabled on Python, Database and Software Engineering courses. Python course would enable participants with skills like logic thinking, designing , problem-solving ability,coding,executing,testing and debugging a program. Database course would support the fresh graduates in understanding why and how data plays a key role in any application. Delivery of any software product or service to clients demands software engineering approach to be followed by IT professionals and these fundamental aspects are covered in Software Engineering Course

Learning Objectives

Enable and Get certified on Python programming aspects. Enable and Get certified on Database concepts. Enable and Get certified on Software Engineering features.

Program Structure

- 1 Other Resource

Skills

- Database - RDBMS Others
- Python - OpenSystem
- Object Oriented Development process
- Algorithms and Data Structures - ALL
- Requirement Engineering
- Waterfall based development
- Scrum
- Quality Assurance

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Table: contractor

contractorid	contractorname	noofconstructions
C1001	ABC constructions	115
C1002	SSN constructions	225
C1003	XYZ constructions	100
C1004	PSN constructions	75
C1005	SSK constructions	65

Table: construction

buildingid	contractorid	status	completiondate
B1001	C1001	In-Progress	NULL
B1002	C1002	completed	20-Aug-17
B1003	C1001	In-Progress	NULL
B1004	C1002	completed	20-Aug-17
B1005	C1004	In-Progress	NULL

Query:

```
SELECT contractorid FROM construction WHERE status='In-Progress' AND contractorid IN (SELECT contractorid FROM contractor WHERE noofconstructions>=100);
```

The page also includes a sidebar titled "Infosys Certification Program - Practice Test" with a heart icon and a menu icon. At the bottom, there are links for Contact Us, FAQs, Feedback, and Terms and Conditions. The system tray shows icons for Windows, Google Chrome, File Explorer, Word, and Excel, along with the date and time (1:31 PM, 5/21/2019).

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How many rows will be fetched when the above query gets executed?

3
 2
 1
 4

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Question 2

Consider the below code:

```
my_queue1 = Queue(3)
my_queue2 = Queue(3)
for value in range(0,3):
    my_queue1.enqueue(value*3)
for value in range(0,3):
    if(value==2):
        break
    my_queue2.enqueue(my_queue1.dequeue())
my_queue2.enqueue(12)
```

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Assumption: Queue class, with the necessary methods, is available
What is the status of my_queue1 and my_queue2 after the execution of above code?

In the options, consider the elements of the queue from Front to Rear

my_queue1: 6, my_queue2: 0, 3
 my_queue1: 6, my_queue2: 0, 3, 12
 my_queue1: Queue is empty, my_queue2: 0, 3, 12
 my_queue1: 0, 3, 6, my_queue2: 0, 3, 12

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Consider the following Python function for a vehicle management system. Objective of the code is to record details of vehicles-

```
def vehicle_record(reg_no,mileage,veh_type,purpose,kickstart,no_of_gears,mil
record=""
if(veh_type == "TwoWheeler"):
    record=reg_no+":TwoWheeler:"+ str(mileage)+":"+kickstart
elif(veh_type == "FourWheeler"):
    record=reg_no+":FourWheeler:"+str(mileage)+":"+no_of_gears
    if(purpose == "Commercial"):
        record=record+":Commercial FourWheeler:"+miles_run
return record

record=vehicle_record("KA09Z7211",15,"FourWheeler","Commercial","No","4","89")
```

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What will be the optimal class structure if this was to be re-written in Object oriented programming?

- 4 independent classes: Vehicle, TwoWheeler, FourWheeler, CommercialFourWheeler
- 3 classes with inheritance: TwoWheeler and FourWheeler inherit from Vehicle
- 4 classes with inheritance: TwoWheeler, FourWheeler and CommercialFourWheeler which inherit from Vehicle
- 4 classes with inheritance: TwoWheeler and FourWheeler inherit from Vehicle; CommercialFourWheeler inherits from FourWheeler

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Question 4

Consider the tables **store** and **sales** given below:

Table:store		
store_id	city	region
S001	New York	East
S002	Chicago	Central
S003	Atlanta	East
S004	Los Angeles	West
S005	San Francisco	West
S006	Philadelphia	East

Table:sales		
productid	desc	store_id
P204	biscuits	S001
P205	shampoo	S004
P204	biscuits	S002
P203	soap	S003
P206	rice	S005
P201	wheat	S001

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Which is the best primary key for the sales table from the following?

- desc
- {productid ,store_id}
- productid
- store_id

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Question 5

Alistar is a Python developer who has written the below code.
He desires the output to be 123 Volvo, but, he is unable to proceed due to an error.

```
class Car:  
    def __init__(self,car_id,car_name):  
        self.__car_id=car_id  
        self.car_name=car_name  
  
car1=Car(123,"Volvo")  
print(car1.car_id,car1.car_name)
```

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Choose two options from below which he should implement to get the desired output?
Note: Line numbers are for reference only.

- Add a method to the Car class as follows: def get_car_id(self): return car_id
- Add a method to the Car class as follows: def get_car_id(self): return self.__car_id
- Change Line 4 to : print(car1.get_car_id(),car1.car_name)
- Change Line 4 to : print(car1.__car_id,car1.car_name)

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Question 6

Identify the statements that will be TRUE after executing the following statements on an empty MongoDB collection.

```
db.fruit.insert([{"_id":501,Fruitname:"Pine apple",Season:"Summer",Price:45},  
 {"_id":502,Fruitname:"Water melon",Season:"Winter",Price:40},  
 {"_id":503,Fruitname:"Custard apple",Season:"Summer",Price:40},  
 {"_id":504,Fruitname:"Banana",Season:"Winter",Price:25},  
 {"_id":505,Fruitname:"Mosambi",Season:"Winter",Price:25},  
 {"_id":506,Fruitname:"Musk melon",Season:"Summer",Price:35}]);  
  
db.fruit.update({$or: [{"Fruitname:"Water melon"}, {"Price:40}]},{$set:{Price:35}});
```

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db.fruit.update({_id: 503}, {\$set:{Price:25}});
db.fruit.update({_id: 506}, {Season:"Winter"});
db.fruit.remove({Price:\$gt:40});

Identify the CORRECT options(select two answers)

- Three fruits will have price as 25
- The fruit collection will have 4 "Winter" seasons
- Two fruits will have price as 35
- Two fruits will have a name ending with "melon"

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Question 7

Consider the table **gift** given below:

Table: gift

giftid	giftname	price	discount	availability
G101	Magic Mug	500	9	10
G102	Golf Set	3550	5	15
G103	Little Astronomer	2000	20	18
G104	Renoir Paintings	1500	15	15
G105	French Gastronomy	3000	7	10
G106	Magic Set	1300	30	30

Query:

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```
SELECT g1.giftid,g1.giftname FROM gift g1 JOIN gift g2
ON g1.availability=g2.availability AND g1.discount>>g2.discount
WHERE g1.discount>7
```

How many rows will be fetched when the above query gets executed?

4
 2
 3
 0

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Question 8

Consider a Patient table with attributes patientid (primary key), patientname, city, dateofbirth and phone. Except patientid no columns are unique. The table has three indexes as follows:

IDX1 - patientid
IDX2 - patientname, dateofbirth
IDX3 - dateofbirth, phone

Which of the following queries will result in INDEX UNIQUE SCAN?

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WHERE city <> 'Mumbai' AND dateofbirth > '30-Mar-1995'
WHERE patientid = 'P1007' AND dateofbirth = '30-Mar-1995'
WHERE patientname = 'Sam' AND dateofbirth = '30-Mar-1995'
WHERE patientname LIKE 'R%'

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Question 9

Consider the table **instructor** given below:

Table: instructor

instructorid	name	subject	university	salary
I201	Alex	Java	Harvard	70000
I202	Sam	Ruby	Oxford	75000
I201	Alex	RDBMS	Harvard	60000
I203	Mitchel	Networking	Cambridge	50000
I202	Sam	RDBMS	Harvard	40000
I203	Mitchel	.NET	Oxford	50000

How many number of rows will be in output after executing the below query?
Query:

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SELECT instructorid, name FROM instructor WHERE salary > 40000
GROUP BY instructorid, name HAVING COUNT (DISTINCT university) > 1;

1
 2
 3
 4

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Question 10

Consider relational schema along with the functional dependencies given below:

gaming (gamename, gametype, amount, playerno, playername, playertype, discount, duration)

playerno → playername, playertype, discount
gamename → gametype, duration, amount
playertype → discount

How many tables will result when the relation is in 3NF?

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playertype -> discount

How many tables will result when the relation is in 3NF?

2
 4
 3
 1

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Question 11

Which of the following statements can replace **Line1** and **Line2** in the below Python code to get output as 'kcjh' ?

```
def func1(st1):
    stack1=Stack(len(st1))
    result=""
    for ch in st1:
        if(ch!="a" and ch!="e" and ch!="i" and ch!="o" and ch!="u"):
            #Line1
        if(ch=="#"):
            #Line2
    while(not stack1.is_empty()):
        result+=stack1.pop()
    print(result)
```

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```
st="hi##jack"
func1(st)
```

Assumption: Stack class, with the necessary methods, is available.

Line1: stack1.pop() Line2: stack1.push(ch)

Line1: stack1.push(ch) Line2: stack1.push(ch)

Line1: stack1.push(ch) Line2: stack1.pop()

Line1: stack1.pop() Line2: stack1.pop()

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Question 12

Consider the table **salesinformation** given below:

Table: salesinformation

region	salesman	sales
North	James	800000
West	Alan	760000
West	David	350000
East	John	124000
North	Nolan	590000
South	Nick	235000
East	Nicholas	145000

Katie and Lisa have written queries to get the below desired output:

REGION	SALESMAN	SALES
North	James	800000
West	Alan	760000
West	David	350000
East	John	124000
North	Nolan	590000
South	Nick	235000
East	Nicholas	145000

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Katie and Lisa have written queries to get the below desired output:

REGION	SALESMAN	SALES
West	Alan	760000
East	John	124000
East	Nicholas	145000

Katie's Query:

```
SELECT * FROM salesinformation WHERE (LOWER(region) LIKE '%t' AND (UPPER(salesman) LIKE '%N' OR UPPER(salesman) LIKE 'N%')) ;
```

Lisa's Query:

```
SELECT * FROM salesinformation WHERE (LOWER(region) LIKE '%th' OR (UPPER(salesman) LIKE '%N' AND UPPER(salesman) LIKE 'N%')) ;
```

Whose query will generate the desired output?

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'%N' AND UPPER(salesman) LIKE 'N%' ;

Whose query will generate the desired output?

Both Lisa's and Katie's
 Neither Lisa's nor Katie's
 Only Katie's
 Only Lisa's

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Question 13

Consider the tables **customer**, **bank** and **account** given below:

Table: customer			Table: bank		
customerno	customername	address	bankcode	bankname	headquarters
C501	Rayan	London	B101	HSBC	London
C502	Scott	New York	B102	DSB	Singapore
C503	Steven	Paris	B103	Citibank	New York
C504	Paul	Sydney	B104	Axis	Mumbai

customerno	bankcode	accountno	accounttype	balance
C501	B104	31457689	Saving	20000

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Table: account

customerno	bankcode	accountno	accounttype	balance
C501	B104	31457689	Saving	20000
C501	B102	45678987	Saving	10000
C503	B102	46789231	Credit	40000
C504	B101	78980012	Recurring Deposits	15000
C503	B102	46982345	Saving	30000
C502	B103	54876798	Credit	45700

```

SELECT customername FROM customer c INNER JOIN account a ON
c.customerno=a.customerno WHERE accounttype IN (SELECT accounttype
FROM account GROUP BY accounttype HAVING COUNT(accounttype) <>
(SELECT MAX(COUNT(accounttype)) FROM account GROUP BY accounttype))
AND LENGTH(customername) < 6;

```

How many rows will be fetched when the above query is executed?

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AND LENGTH(customername) < 6;

How many rows will be fetched when the above query is executed?

3
 4
 1
 2

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Question 14

Consider the python code below.
Assume that necessary imports have been done.

```
class Shape(metaclass=ABCMeta):
    def __init__(self):
        print("I am in init")

    @abstractmethod
    def draw_shape(self):
        pass

    @abstractmethod
    def set_color(self):
        pass

class Circle(Shape):
    def __init__(self):
        super().__init__()

    def draw_shape(self):
        print("Drawing a circle")
```

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```
class Circle(Shape):
    def draw_shape(self):
        print("Draw Circle")
```

Which of the following statement(s) is/are TRUE?

i) Class Circle cannot be instantiated as it does not implement set_color() method
ii) The above code will not execute because class Shape has two abstract methods

Only i) is True
 Only ii) is True
 Both i) and ii) are True
 Neither of i) or ii) is True

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```
class Circle(Shape):
    def draw_shape(self):
        print("Draw Circle")
```

Which of the following statement(s) is/are TRUE?

i) Class Circle cannot be instantiated as it does not implement set_color() method
ii) The above code will not execute because class Shape has two abstract methods

Only i) is True
 Only ii) is True
 Both i) and ii) are True
 Neither of i) or ii) is True

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Question 15

Consider the Hashing methods given below-

i) $h(key) = key \% 10$
ii) $h(key) = key \% 25$
iii) $h(key) = key \% 50$

Which of the hashing methods would **NOT** lead to collision when the following values are to be stored in the hash table?

80, 20, 35, 45, 25, 90

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to be stored in the hash table?

80, 20, 35, 45, 25, 90

Only iii)
 Both ii) and iii)
 Both i) and iii)
 All i), ii) and iii)

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Question 16

What will be the output of the code below?

```
class ClassA:
    def __init__(self, val1):
        self.value=val1
    def method_a(self):
        return 10+self.value
class ClassB:
    def __init__(self, val2):
        self.num=val2
    def method_b(self,obj):
        return obj.method_a()+self.num

obj1=ClassA(20)
obj2=ClassB(30)
```

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```
obj1=ClassA(20)
obj2=ClassB(30)
print(obj2.method_b(obj1))
```

60
 50
 30
 40

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```
class Sample:
    def __init__(self, val):
        self.val=val
    def method1(self):
        return self.val//2

class Parent:
    counter=0
    def __init__(self, val1):
        Parent.counter+=1
        self.num1=val1
    def method2(self):
        self.num1*=3
```

At the bottom of the page are links for 'Contact Us', 'FAQs', 'Feedback', and 'Terms and Conditions'. The system tray at the bottom right shows the date as 5/21/2019 and the time as 1:56 PM.

This screenshot shows the same web browser window after the user has scrolled down. The page content now displays a different block of Python code:

```
self.num1=val1
def method2(self):
    self.num1*=3
    return self.num1

class Child(Parent):
    variable=100
    def __init__(self, val1, val2, obj):
        Parent.counter-=1
        super().__init__(val1)
        self.num2=val2+Child.variable
        self.obj_x=obj
    def method1(self):
        return (self.obj_x.method1()+self.num1)
obj1=Sample(20)
obj2=Child(15,20,obj1)
print(obj2.method1()+obj2.method2()+Parent.counter)
```

Links for 'Contact Us', 'FAQs', 'Feedback', and 'Terms and Conditions' are visible at the bottom. The system tray at the bottom right shows the date as 5/21/2019 and the time as 1:57 PM.

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test

69
43
70
71

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test

Question 18

Consider the tables **project** and **allocation** given below:

Table:project

projectid	projectname
Infy101	NAB
Infy102	All State Bank
Infy103	Suntrust
Infy104	Swiss Insure

Table:allocation

empid	empname	projectid
E300	Olivia	Infy102
E301	Hussey	Infy102
E302	Mike	Infy103
E303	Jack	
E304	Smith	

**SELECT p.projectid, p.projectname, a.empid
FROM project p FULL JOIN allocation a**

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FROM project p **FULL JOIN** allocation a
ON p.projectid=a.projectid **AND** a.PROJECTID **IS NOT NULL** ;

How many rows will be fetched when the above query is executed?

7
 5
 3
 6

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Question 19

Number 14 needs to be searched using BINARY SEARCH in the following sorted list of numbers:

1, 3, 7, 9, 14, 19, 45

How many comparisons will be required to conclude that the number 14 is found at 5th position?

Note: We have used integer division for finding the middle element and the index starts with 0 (zero)

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NOTE: WE HAVE USED INTEGER DIVISION FOR FINDING THE MIDDLE ELEMENT AND THE INDEX STARTS WITH 0 (ZERO)

2
3
4
1

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Question 20

Consider the following Python code snippet.

```
class ClassA:  
    param1=200  
    def __init__(self):  
        self.__param1 = 100  
  
    def method1(self):  
        #Line1_____  
  
    @staticmethod  
    def method2():  
        #Line2_____
```

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```
def method2():
    #Line2_____  
  
obj1=ClassA()
obj1.method1()
#Line3_____
```

Note: Line numbers are for reference only.
Fill in the blanks at Line1,Line2 and Line3 to get the output as 302.
Choose TWO CORRECT options-

Line1:ClassA.__param1=(ClassA.__param1+1)+self.__param1
 Line2:print(self.__param1+1) Line3:self.method2()

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```
def method2():
    #Line2_____  
  
obj1=ClassA()
obj1.method1()
#Line3_____
```

Line1:ClassA.__param1=(ClassA.__param1+1)+self.__param1
 Line2:print(self.__param1+1) Line3:self.method2()

 Line1:ClassA.__param1=(ClassA.__param1+2)+ClassA.__param1
 Line2:print(ClassA.__param1) Line3:ClassA.method2()

 Line1:ClassA.__param1=(ClassA.__param1+1)+self.__param1
 Line2:print(ClassA.__param1+1) Line3:ClassA.method2()

 Line1:ClassA.__param1=(ClassA.__param1+2)+self.__param1
 Line2:print(ClassA.__param1) Line3:method2()

 Line1:ClassA.__param1=ClassA.__param1+(self.__param1+2)

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Line1:ClassA.__param1=(ClassA.__param1+2)+ClassA.__param1
Line2:print(ClassA.__param1) Line3:ClassA.method2()

Line1:ClassA.__param1=(ClassA.__param1+1)+self.__param1
Line2:print(ClassA.__param1+1) Line3:ClassA.method2()

Line1:ClassA.__param1=(ClassA.__param1+2)+self.__param1
Line2:print(ClassA.__param1) Line3:method2()

Line1:ClassA.__param1=ClassA.__param1+(self.__param1+2)
Line2:print(ClassA.__param1) Line3:ClassA.method2()

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test

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Extract Digits

Identify Palindrome

Infosys Certification Program - Practice Test

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Given a string **str**, print a number **num** by extracting all the digits from **str** in the same order as in **str**.

Print a negative number **num** if the first character in **str** is '-'.

Input format:

Read the string **str** from the standard input stream.

Output format:

Print the number **num** to the standard output stream.

Assumption(s):

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M Criteria-9 (Last year s X | M Inbox (78) - nriitcorp X | G INDUSTRIAL VISIT PH X | f (1) Nrgroup Ofcollege X | InfyTQ | Viewer X +

- String **str** will have at least one integer and will not be empty.

Sample Input	Sample Output	Explanation
08912	892	Digits present in the input are 8,9 and 2 and hence the output is 892.
-1234abf&567	-1234567	Digits present in the input are 1,2,3,4,5,6 and 7. Since the first character is '-' the output is a negative number i.e. -1234567

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The screenshot shows a web browser window with multiple tabs open at the top. The active tab is 'InfyTQ | Viewer' with the URL https://infytq.infosys.com/viewer/lex_auth_01274825990015385699. The main content area features the InfyTQ logo and navigation links: LEARNING JOURNEY, CERTIFICATION, ALUMNI STORIES, CONTEST ARENA, GALLERY, and GET TO KNOW US. A sidebar on the right is titled 'Infosys Certification Program - Practice Test'. The central area contains a code editor with the following Python 3 code:

```
1 #For input use:
2 #inputString = input()
3 print("Hello Friend")
```

Below the code editor are buttons for Fullscreen, A+, A-, and Reset. At the bottom of the page are links for Contact Us, FAQs, Feedback, and Terms and Conditions. The Windows taskbar at the bottom shows icons for various applications like File Explorer, Word, and Excel.

This screenshot shows the same InfyTQ | Viewer interface as the first one, but with a significant difference: the central code editor area is completely blacked out, obscuring all content. The 'Provide input' checkbox and the 'Run' button are visible at the bottom of the editor area. The rest of the interface, including the sidebar, footer, and taskbar, remains identical to the first screenshot.

Infosys Certification Program - Practice Test

Test case	Result
1	✗ Incorrect
2	✗ Incorrect
3	✗ Incorrect
4	✗ Incorrect
5	✗ Incorrect

Marks Obtained: 0

Run Submit

Info

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Infosys Certification Program - Practice Test

2:01 PM 5/21/2019

Extract Digits
0 %

Identify Palindrome

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Infosys Certification Program - Practice Test

2:02 PM 5/21/2019

For a given positive number **num**, identify the palindrome formed by performing the following operations-

- Add **num** and its reverse
- Check whether the sum is palindrome or not. If not, add the sum and its reverse and repeat the process until a palindrome is obtained

For example:

If original integer is 195, we get 9,339 as the resulting palindrome after the fourth addition:

195 786
591 687
+ --- + ---
786 1,473
1,473 3,741
+ --- + ---
5,214 4,125
5,214 + ---
9,339

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2:02 PM
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For a given positive number **num**, identify the palindrome formed by performing the following operations-

- Add **num** and its reverse
- Check whether the sum is palindrome or not. If not, add the sum and its reverse and repeat the process until a palindrome is obtained

For example:

If original integer is 195, we get 9,339 as the resulting palindrome after the fourth addition:

195 786
591 687
+ --- + ---
786 1,473
1,473 3,741
+ --- + ---
5,214 4,125
5,214 + ---
9,339

Input format:
Read **num** from the standard input stream.

Output format:

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2:02 PM
5/21/2019

The screenshot shows a web browser window with multiple tabs open at the top. The active tab is for the InfyTQ | Viewer, specifically a practice test for the Infosys Certification Program. The page content includes a header with navigation links like LEARNING JOURNEY, CERTIFICATION, ALUMNI STORIES, CONTEST ARENA, GALLERY, and GET TO KNOW US. Below the header, there's a section titled "Output format:" with instructions: "Print the palindrome calculated to the standard output stream." A table provides sample inputs and outputs along with explanations:

Sample Input	Sample Output	Explanation
124	545	The sum of 124 and its reverse 421 is 545 which is a palindrome.
4	8	The sum of 4 and its reverse 4 is 8 which is a palindrome.

At the bottom of the page, there are links for Contact Us, FAQs, Feedback, and Terms and Conditions. The system tray at the bottom right shows the date and time as 5/21/2019 2:02 PM.

This screenshot shows the same InfyTQ | Viewer interface, but the main content area is a code editor. The title bar indicates "Languages: Python 3". The editor interface includes sections for "Select language" (set to Python 3), "Select theme" (set to dracula), and "Editor Options" with buttons for Fullscreen, A+, A-, and Reset. Below these is a code input field containing the following Python 3 code:

```
1 #for input use:  
2 #inputString = input()  
3 print("Hello Friend")
```

The bottom navigation links and system tray are identical to the first screenshot.

The screenshot shows a web browser window with the URL https://inftytq.infosys.com/viewer/lex_auth_01274825990015385699. The main content area displays a large black rectangular placeholder for content. Below it are two small yellow buttons labeled "Undo" and "Redo". A tooltip "Provide input ⓘ" is visible next to the "Undo" button. At the bottom right are three buttons: "Save" (gray), "Run" (blue), and "Submit" (green). A callout bubble above the "Run" and "Submit" buttons says "Save and compile across test cases.". The top navigation bar includes links for LEARNING JOURNEY, CERTIFICATION, ALUMNI STORIES, CONTEST ARENA, GALLERY, and GET TO KNOW US. On the right side, there is a sidebar titled "Infosys Certification Program - Practice Test" with a heart icon and a three-dot menu icon.

The screenshot shows the same web browser window after a practice test has been run. The main content area now displays a table titled "Infosys Certification Program - Practice Test" with the following data:

Test Case	Result
1	✗ Incorrect
2	✗ Incorrect
3	✗ Incorrect
4	✗ Incorrect
5	✗ Incorrect
6	✗ Incorrect
7	✗ Incorrect

Below the table, the text "Marks Obtained: 0" is displayed. The rest of the interface is identical to the first screenshot, including the top navigation bar and the sidebar on the right.