



ARTIFICIAL INTELLIGENCE LAB

BSCYS-3rd Semester

Fall 2025

Lab Report # 4

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DEPARTMENT OF COMPUTER SCIENCE HITEC UNIVERSITY TAXILA

BS CYBER SECURITY PROGRAM

Task 1: Circle Class (Area & Perimeter)

Code:

```
employee_management.py X
employee_management.py > ...
1  class Circle:
2      def __init__(self, radius):
3          self.radius = radius
4
5      def area(self):
6          return 3.14159 * self.radius * self.radius
7
8      def perimeter(self):
9          return 2 * 3.14159 * self.radius
10
11
12  c = Circle(7)
13  print("Area:", c.area())
14  print("Perimeter:", c.perimeter())
15
16
```

Output:

```
IZAN COMPUTER/AppData/Local/Programs/Python/Python314/python.exe" "c:/
Users/FAIZAN COMPUTER/Desktop/Heart Diseases Lab/employee_management.p
y"
Area: 153.93791
Perimeter: 43.98226
```

Task 2: Implement pow(x, n) (No built-in function)

Code:

```
... ployee_management.py  circle.py  power_function.py X  ▸ ▾  □  ...  
power_function.py > ...  
1  class Power:  
2      def pow(self, x, n):  
3          result = 1  
4  
5          if n > 0:  
6              for _ in range(n):  
7                  result *= x  
8          elif n < 0:  
9              for _ in range(abs(n)):  
10                 result *= x  
11                 result = 1 / result  
12          else:  
13              result = 1  
14  
15          return result  
16  
17  
18  p = Power()  
19  print(p.pow(2, 3))    # 8  
20  print(p.pow(2, -2))  # 0.25  
21  print(p.pow(5, 0))   # 1  
22  |
```

Output:

```
PS C:\Users\FAIZAN COMPUTER\Desktop\Heart Diseases Lab> & "C:/Users/FAIZAN COMPUTER/AppData/Local/Programs/Python/Python314/python.exe" "c:/Users/FAIZAN COMPUTER/Desktop/Heart Diseases Lab/power_function.py"
8
0.25
1
PS C:\Users\FAIZAN COMPUTER\Desktop\Heart Diseases Lab>
```

Task 3:

Code:

item_inheritance.py > ...

```
1 class Item:
2     def __init__(self, name, description, price):
3         self.name = name
4         self.description = description
5         self.price = price
6
7     def viewFullDescription(self):
8         print("Name:", self.name)
9         print("Description:", self.description)
10        print("Price:", self.price)
11
12    def addToShoppingBasket(self):
13        print(self.name, "added to shopping basket")
14
15    def removeFromShoppingBasket(self):
16        print(self.name, "removed from shopping basket")
17
18
19 class MP3(Item):
20     def __init__(self, name, description, price, artist, duration):
21         super().__init__(name, description, price)
22         self.artist = artist
23         self.duration = duration
24
25     def play(self):
26         print("Playing MP3")
27
28     def download(self):
29         print("Downloading MP3")
30
```

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```
32 class DVD(Item):
33     def __init__(self, name, description, price, certif.
34         super().__init__(name, description, price)
35         self.certificate = certificate
36         self.duration = duration
37         self.actors = actors
38
39     def viewTrailer(self):
40         print("Viewing DVD trailer")
41
42
43 class Book(Item):
44     def __init__(self, name, description, price, author
45         super().__init__(name, description, price)
46         self.author = author
47         self.numberOfPages = numberOfPages
48         self.genre = genre
49
50     def previewContent(self):
51         print("Previewing book content")
52
53
54 mp3 = MP3("Song", "Pop Song", 300, "Atif", "4 min")
55 dvd = DVD("Movie", "Action Movie", 1500, "PG-13", "2 hr
56 book = Book("Python", "Programming Book", 1200, "John",
57
58 mp3.viewFullDescription()
59 mp3.play()
60
61 dvd.viewFullDescription()
```

```

56  book = Book("Python", "Programming Book", 1200, "John",
57
58  mp3.viewFullDescription()
59  mp3.play()
60
61  dvd.viewFullDescription()
62  dvd.viewTrailer()
63
64  book.viewFullDescription()
65  book.previewContent()
66

```

Output:

```

PS C:\Users\FAIZAN COMPUTER\Desktop\Heart Diseases Lab> & "C:/Users/FA
FAIZAN COMPUTER/AppData/Local/Programs/Python/Python314/python.exe" "c:/
Users/FAIZAN COMPUTER/Desktop/Heart Diseases Lab/item_inheritance.py"
Name: Song
Description: Pop Song
Price: 300
Playing MP3
Name: Movie
Description: Action Movie
Price: 1500
Viewing DVD trailer
Name: Python
Description: Programming Book
Price: 1200
Previewing book content
PS C:\Users\FAIZAN COMPUTER\Desktop\Heart Diseases Lab>

```

Conclusion:

In this lab, we learned how Object-Oriented Programming works in Python by doing different practical tasks. We created classes and objects to represent real-life things like employees, circles, and shopping items. We also learned how constructors are used to initialize data and how inheritance helps in reusing code by creating child classes from parent classes. The power function task helped us understand logic building without using built-in functions. Overall, these tasks improved our understanding of OOP concepts such as classes, objects, inheritance, and code reusability in a simple and practical way.