PFDS

TERM 1 FINAL EXAM -- PART TWO

SHORT ANSWERS (CODING)

In [20]:
```
import math
```

Problem #1:

Given a list of numbers, write a program to turn every item of the list into the difference of the item cubed minus the square root of the item.

Given: [1, 4, 9, 16, 25]

Expected Output: [0, 62, 726, 4092, 15620

In [8]:
```
given = [1, 4, 9, 16, 25]
[int((num**3)-(math.sqrt(num)) )for num in given]
```

Out[8]:
```
[0, 62, 726, 4092, 15620]
```

Problem #2: Write a program to add item "west" after "east" in the following Python list.

["cat", "dog", ["red", "white", "blue" ["north", "south", "east"], "football". "basketball"], "apple", "orange"]

Expected Output:

["cat", "dog", ["red", "white", "blue" ["north", "south", "east", "west"], "football". "basketball"], "apple", "orange"]

In [22]:
```
lists = ["cat", "dog", ["red", "white", "blue", ["north", "south", "east"], "football",
lists[2][3].append('west')
print(lists)
```

```
['cat', 'dog', ['red', 'white', 'blue', ['north', 'south', 'east', 'west'], 'football',
'basketball'], 'apple', 'orange']
```

Problem #3: Information about a fictitious college student ... Sally Jones, Female, 19,

Harvard, Computer Science
1. Create a tuple of values and assign that tuple to a variable named student. Write code to print out student, the data type that student is is, and the number of items in student. Use f-string formatting to enhance your output. 2. Create a tuple of variables to represent the tuple of values from Part 1 and assign the variable student to that tuple. Use f-string formatting to print out the following statement: *Sally Jones is a 19 year old Computer Science major at Harvard.*

3. Sally just had a birthday and she also decided to change her major to Data Science and transfer to Stanford. Use the original tuple to create a new tuple with the same name that includes this updated information. Print out the new tuple.
4. Use f-string formatting to print out the following statement: *Sally Jones is now 20 years old and has transferred to Stanford where she will major in Data Science.*

In [2]:
```
student = ("Sally Jones", "Female", 19, "Harvard", "Computer Science")
print(f"Student is {student}. The data type of student is a {type(student)}. The length

print("\n")
(name, gender, age, college, major) = student
print(f"{name} is {age} year old {major} major at {college}.")

print("\n")
studentAsList = list(student)
studentAsList[2] = 20
studentAsList[3] = "Stanford"
studentAsList[len(studentAsList)-1] = "Data Science"
student = tuple(studentAsList)
print(student)
print("\n")
print(f"{name} is now {age} and has transferred to {college} where she will major in {m
```

```
Student is ('Sally Jones', 'Female', 19, 'Harvard', 'Computer Science'). The data type
of student is a <class 'tuple'>. The length of student is 5.


Sally Jones is 19 year old Computer Science major at Harvard.


('Sally Jones', 'Female', 20, 'Stanford', 'Data Science')


Sally Jones is now 19 and has transferred to Harvard where she will major in Computer S
cience.
```

Problem #4:

Write code to copy elements "soccer" and "tennis" from the tuple_1 into a new tuple named tuple_2.

tuple_1 = ("red", "white", "blue", "soccer", "green", "yellow", "tennis", "pink". "orange")

In [5]:
```
tuple_1 = ("red", "white", "blue", "soccer", "green", "yellow", "tennis", "pink", "orang
tuple_2 =tuple_1[3:7:3]
print(tuple_2)
```

```
('soccer', 'tennis')
```

Problem #5:

Create a dictionary named school_dict from the table below. Use school as the key.

Print out school_dict. ![a1.jpg](attachment:a1.jpg)

In [6]:
```
school_dict = {
    'bchs':['Lancers',1244],
    'behs':['Spartans',1298],
    'tosa_east':['Red Raiders', 1191]
}
print(school_dict)
```

```
{'bchs': ['Lancers', 1244], 'behs': ['Spartans', 1298], 'tosa_east': ['Red Raiders', 11
91]}
```

Problem #6:

Change Johns's salary to 90000, Kate's job to doctor, and Bill's name to William in the given Python dictionary.

employee_dict = { 'emp1': {'name': 'John', 'salary': 75000, 'job': 'Accountant}, 'emp2': {'name': 'Kate', 'salary': 100000, 'job': 'engineer'}, 'emp3': {'name': 'Bill', 'salary': 80000, 'job': 'lawyer'} }

In [8]:
```
employee_dict = {
    'emp1': {
        'name': 'John',
        'salary': 75000,
        'job': 'Accountant'
    },
    'emp2': {
        'name': 'Kate',
        'salary': 100000,
        'job': 'engineer'
    },
    'emp3': {
        'name': 'Bill',
        'salary': 80000,
        'job': 'lawyer'
    }
}

employee_dict['emp1']['salary'] = 90000
employee_dict['emp2']['job']='doctor'
employee_dict['emp3']['name']='William'
print(employee_dict)
```

```
{'emp1': {'name': 'John', 'salary': 90000, 'job': 'Accountant'}, 'emp2': {'name': 'Kat
e', 'salary': 100000, 'job': 'doctor'}, 'emp3': {'name': 'William', 'salary': 80000, 'j
ob': 'lawyer'}}
```

Problem #7:

Use a for loop, the range function, and a continue statement to print out the following output:

7 8 9 10 11 13 14 15 16 18

In [18]:
```
for x in range(7,19):
    if x != 12 and x != 17:
        print(x, end=" ")
```

```
7 8 9 10 11 13 14 15 16 18
```

Problem #8: Use a while loop to create the list [7, 10, 13, 16, 19, 22].

In [15]:
```
list = []
for x in range(7,23,3):
    list.append(x)
print(list)
```

```
[7, 10, 13, 16, 19, 22]
```

Problem #9: Write code that uses a list comprehension that takes the given list input_list and creates a new list that consists of the square root values values of only the even number in numbers in input_list.

input_list = [1, 4, 9, 16, 25, 36, 49, 64, 100, 400, 729, 900]

Desired Output
[2, 4, 6, 8, 10, 20, 30]

In [22]:
```
input_list = [1, 4, 9, 16, 25, 36, 49, 64, 100, 400, 729, 900]
[int(math.sqrt(i)) for i in input_list if i%2==0]
```

Out[22]:
```
[2, 4, 6, 8, 10, 20, 30]
```

Problem #10:

a. Write a program that uses a lambda function with filter() to filter out only the multiples of 7 from the given list.

list1 = [5, 12, 21, 28, 32, 40, 49, 63, 72, 84, 93, 98, 100]

b. Write a program that uses a lambda function with map() to square each item in the given list and then subtract 4.

list2 = [5, 8, 11, 14, 19, 24]

In [4]:
```
list1 = [5, 12, 21, 28, 32, 40, 49, 63, 72, 84, 93, 98, 100]

result = list(filter(lambda x: (x % 7 == 0), list1))
print(result)

list2 = [5, 8, 11, 14, 19, 24]
result2 = list(map(lambda x:((x**2)-4), list2))
print(result2)
```

```
[21, 28, 49, 63, 84, 98]
[21, 60, 117, 192, 357, 572]
```

In [ ]: