Advanced Programming for Python
Assignment#1

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1. Number Swapping

Code:

```
a = input("Enter First Number")
b = input("Enter Second Number")
# The numbers have been assigned to new variables for swapping
c = a
d = b
# The numbers are swapped in the next command
a = d
b = c
print(a)
print(b)
```

Output:

```
runcell(0, 'F:/Masters/Semester 1/Advanced Programming for
Python/Assignment/Assignment#1/Swap_Numbers.py')
Enter First Number 1
Enter Second Number 2
 2
 1
```

2. Factorial of a Number

Code:

```
# Defining a function for factorial. Had to understand and lookup recursion for
# this example.
a = int(input("Enter the Number for Factorial: "))
def factorial(x):
    if x==1:
        return 1
    else:
        return(x*factorial(x-1))
print(factorial(a))
```

Output:

```
runcell(0, 'F:/Masters/Semester 1/Advanced Programming for
Python/Assignment/Assignment#1/Factorial_Calculation.py')
Enter the Number for Factorial: 5
120

runcell(0, 'F:/Masters/Semester 1/Advanced Programming for
Python/Assignment/Assignment#1/Factorial_Calculation.py')
Enter the Number for Factorial: 7
5040
```

3. Fibonacci Sequence

Code:

```
# Going to print the first 20 digits of the fibonacci sequence
a = 0
b = 1
for i in range (0,20):
    c = a + b
    a = b
    b = c
    i += 1
    print(c)
```

Output:

```
runcell(0, 'F:/Masters/Semester 1/Advanced Programming for
Python/Assignment/Assignment#1/Fibonacci_Sequence.py')
1
2
3
5
8
13
21
34
55
89
144
233
377
610
987
1597
2584
4181
6765
10946
```

4. String Operations

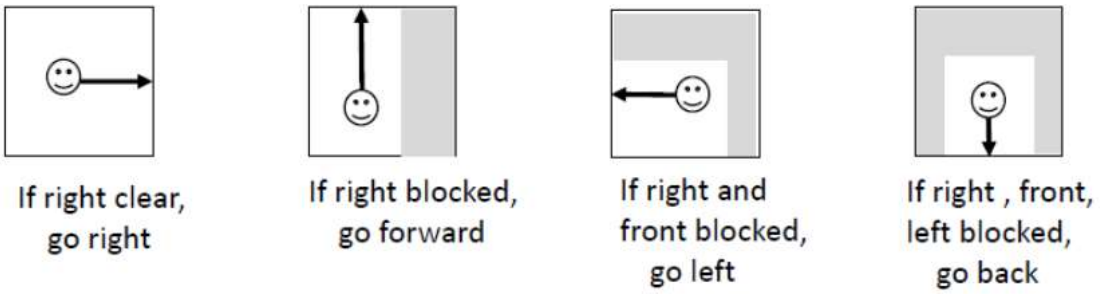
Code:

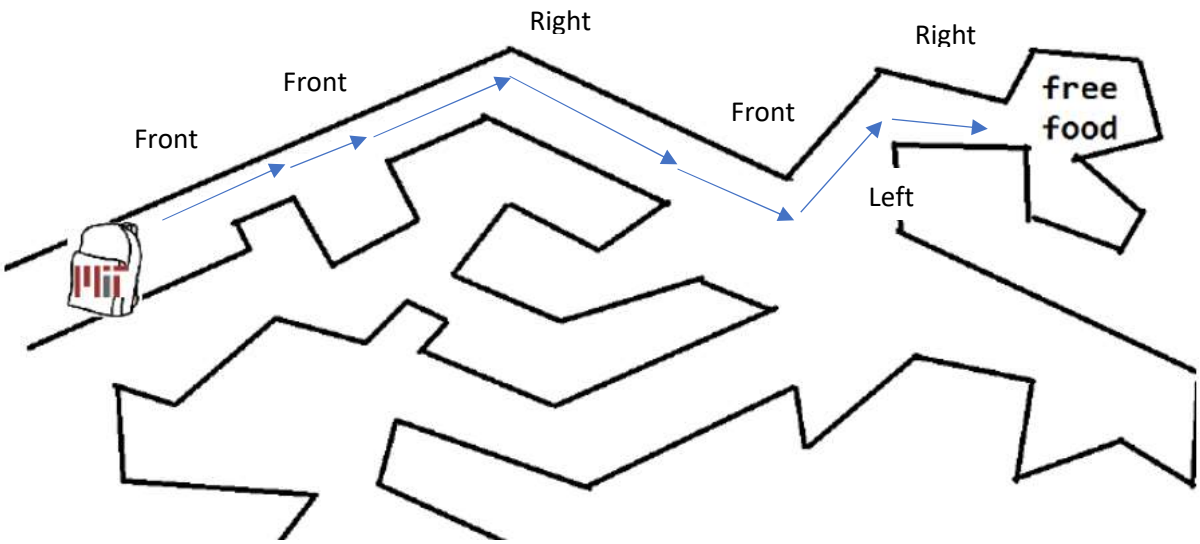
```
name = "Daud Raza"
# Checking len() command
print(len(name))
# Checking substring function
print(name[0:4])
print(name[5:9])
print(name[0:9:2])
# Checking concatenation of strings
field = "Engineering"
task = name + " works in " + field
print(task)
```

Output:

```
runfile('F:/Masters/Semester 1/Advanced Programming for Python/Assignment/Assignment#1/String_test.py', wdir='F:/Masters/Semester 1/Advanced Programming for Python/Assignment/Assignment#1')
9
Daud
Raza
Du aa
Daud Raza works in Engineering
```

5. Pathfinding for Free Food





Code:

```
free_food = 0
while free_food == 0:
    end = input("Are you at the location of the Free Food? Type Y/N ")
    if end == "Y" or end == "y":
        print("Congrats! you have arrived!")
        break
    elif end =="N" or end =="n":
```

```
        move_right = input("Is the location towards the right? Type Y/N ")
        if move_right == "Y" or move_right =="y":
            print("Move towards the right")
            end
            if end == "Y" or end == "y":
                print("Congrats! you have arrived!")
                break
        elif move_right =="N" or move_right =="n":
            move_forward = input("Is the location towards the front? Type Y/N ")
            if move_forward== "Y" or move_forward=="y":
                print("Move forward")
                end
                if end == "Y" or end == "y":
                    print("Congrats! you have arrived!")
                    break
            elif move_forward =="N" or move_forward =="n":
                move_left = input("Is the location towards the left? Type Y/N ")
                if move_left== "Y" or move_left=="y":
                    print("Move towards the left")
                    end
                    if end == "Y" or end == "y":
                        print("Congrats! you have arrived!")
                        break
                elif move_left =="N" or move_left =="n":
                     print("All paths are blocked, move back!")
```

Output:

```
runcell(0, 'F:/Masters/Semester 1/Advanced Programming for
Python/Assignment/Assignment#1/Path_finding.py')
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N n
Is the location towards the front? Type Y/N y
Move forward
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N n
Is the location towards the front? Type Y/N y
Move forward
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N y
Move towards the right
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N n
Is the location towards the front? Type Y/N y
Move forward
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N n
Is the location towards the front? Type Y/N n
Is the location towards the left? Type Y/N y
Move towards the left
Are you at the location of the Free Food? Type Y/N n
Is the location towards the right? Type Y/N y
Move towards the right
Are you at the location of the Free Food? Type Y/N y
Congrats! you have arrived!
```