Loops, Conditionals and Algorithmic Thinking Exercise 4A (Compulsory)

1. Create an if-else conditional statement where a user inputs a number and outputs positive, negative, zero or string number.

   e.g.
   input: -2
   output: Negative

In [2]:
```
num = float(input("Enter a number: "))
if num > 0:
   print("Positive number")
elif num == 0:
   print("Zero")
elif num < 0:
   print("Negative Number")
else:
   print("Are you sure thats a number")
```

```
Enter a number: -3
Negative Number
```

1. Use a while statement to create a counter for popularity between pizza, tacos, sushi, and hamburger. When the counter for any item reaches 5, print the most popular item. Ensure that user inputs is in lowercase.

   e.g.
   Select between the followings.
   1. pizza
   2. tacos
   3. sushi
   4. hamburger1
   Select between the followings.
   1. pizza
   2. tacos
   3. sushi
   4. hamburger2
   Select between the followings.
   1. pizza
   2. tacos
   3. sushi
   4. hamburger1
   Select between the followings.
   1. pizza
   2. tacos
   3. sushi
   4. hamburger1
   Select between the followings.
   1. pizza
   2. tacos
   3. sushi
   4. hamburger1
   Select between the followings.

```
1. pizza
2. tacos
3. sushi
4. hamburger1
Pizza is the most popular.
```

In [38]:

```
p=0
t=0
s=0
h=0
dict_food = {'pizza': p, 'taco': t, 'sushi': s, 'hamburger': h}

while True:
    food = input('pizza(p), taco(t), sushi(s), hamburger(h): ')
    print(dict_food)
    if food == 'p':
        dict_food['pizza'] += 1
        if dict_food['pizza'] >= 5:
            print('pizza is most popular')
            break
    elif food == 't':
        dict_food['taco'] += 1
        if dict_food['taco'] >= 5:
            print('taco is most popular')
            break
    elif food == 's':
        dict_food['sushi'] += 1
        if dict_food['sushi'] >= 5:
            print('sushi is most popular')
            break
    elif food =='h':
        dict_food['hamburger'] += 1
        if dict_food['hamburger'] >= 5:
            print('hamburger is most popular')
            break
    else:
        print('thats not a valid answer')
print(dict_food)
```

```
pizza(p), taco(t), sushi(s), hamburger(h): p
{'pizza': 0, 'taco': 0, 'sushi': 0, 'hamburger': 0}
pizza(p), taco(t), sushi(s), hamburger(h): p
{'pizza': 1, 'taco': 0, 'sushi': 0, 'hamburger': 0}
pizza(p), taco(t), sushi(s), hamburger(h): p
{'pizza': 2, 'taco': 0, 'sushi': 0, 'hamburger': 0}
pizza(p), taco(t), sushi(s), hamburger(h): p
{'pizza': 3, 'taco': 0, 'sushi': 0, 'hamburger': 0}
pizza(p), taco(t), sushi(s), hamburger(h): p
{'pizza': 4, 'taco': 0, 'sushi': 0, 'hamburger': 0}
pizza is most popular
{'pizza': 5, 'taco': 0, 'sushi': 0, 'hamburger': 0}
```

1. Create a while statement that keeps adding numbers until input is a not a digit.

```
e.g.
Enter a number: 8
Enter a number: 3
Enter a number: 31
Enter a number: 4
Enter a number: u
The sum of the numbers is 46
```

In [100…
```
n = 0
while True:
    strn = input('enter a number: ')
    if strn.isdigit() == True:
        n += int(strn)

    else:
        print(n)
```

```
---------------------------------------------------------------------------
KeyboardInterrupt                         Traceback (most recent call last)
<ipython-input-100-ce943d70cb2c> in <module>
      1 n = 0
      2 while True:
----> 3     strn = input('enter a number: ')
      4     if strn.isdigit() == True:
      5         n += int(strn)

~\anaconda3\lib\site-packages\ipykernel\kernelbase.py in raw_input(self, prompt)
    858                 "raw_input was called, but this frontend does not support in
put requests."
    859             )
--> 860         return self._input_request(str(prompt),
    861             self._parent_ident,
    862             self._parent_header,

~\anaconda3\lib\site-packages\ipykernel\kernelbase.py in _input_request(self, promp
t, ident, parent, password)
    902             except KeyboardInterrupt:
    903                 # re-raise KeyboardInterrupt, to truncate traceback
--> 904                 raise KeyboardInterrupt("Interrupted by user") from None
    905             except Exception as e:
    906                 self.log.warning("Invalid Message:", exc_info=True)

KeyboardInterrupt: Interrupted by user
```

4. Given a list of integers, create a for loop to multiply all the integers in the list.

e.g.
list =[1,2,3,4,5,6]
output: 720

In [60]:
```
list_nn =[1,2,3,4,5,6]
result = 1
for i in list:
    result = result * i

result
```

Out[60]:
```
720
```

1. Create an implementation of the bubble sort.

In [64]:
```
our_list = [19, 13, 6, 2, 18, 8]
for i in range(len(our_list)):
        for j in range(len(our_list) - 1):
            if our_list[j] > our_list[j+1]:
```

```
                our_list[j], our_list[j+1] = our_list[j+1], our_list[j]
print(our_list)
```

```
[2, 6, 8, 13, 18, 19]
```

1. Solve this equation using Python: $\sum_{k=0}^{10}[(\frac{12\times23}{3^4})^7+2^k]$

In [ ]:

```

```

1. Given a list of integers, loop over the list and print the even numbers in the list

   e.g.
   l = [1,15,73,6,3,3,242,4,2,8,45,7,3]
   output:
   6
   242
   4
   2
   8

In [72]:

```
lst1 = [1,15,73,6,3,3,242,4,2,8,45,7,3]
num = 0
for num in lst1:
    if num % 2 == 0:
        print(num, end = " ")
```

```
6 242 4 2 8
```

1. Using a for-loop and an if-statement, print each letter in the string "abcdefghij", if that letter is a vowel.

   e.g.
   letter = "abcdefghij"
   output:
   a
   e
   i

In [87]:

```
sentence = input('Enter your sentence: ' )
for letter in sentence:
    if letter in 'aeiou':
        print(letter)
```

```
Enter your sentence: hello what up, the ceiling
e
o
a
u
e
e
i
i
```

1. Given a list of nonzero, positive numbers, x, append the sum of that list to the end of it. Do this until the last value in x is at least 100. Use a while-loop.

If you start with x = [1], then by the end of your while-loop x should be [1, 1, 2, 4, 8, 16, 32, 64, 128].

In [115…

```
x=[1]
while True:
    if max(x)<100:
        x.append(max(x)*2)

    else:
        print(x)
        break
```

```
[1, 2, 4, 8, 16, 32, 64, 128]
```

1. Loop over a list of integers repeatedly, summing up all of its even values, and adding the content to a total. Repeat this process until the the total exceeds 100, or if you have looped over the list more than 50 times. Print the total only if it exceeds 100.
   e.g.
   x = [3, 4, 1, 2, 8, 10, -3, 0]
   output: 120

In [125…

```
my_list = [3, 4, 1, 2, 8, 10, -3, 0]
result = 0
while True:
    if result < 100:
        for i in my_list:
            if i%2 == 0:
                result += i
    else:
        print(result)
        break
```

```
120
```