SESSION NINETEEN

Bioinformatics internship

BOOLEAN

- Data type with two possible values
- Boolean operators:
  - “<expression1> and <expression2>” – AND
  - “<expression1> or <expression2>” – OR
  - “not <expression1>” – NOT
- Demorgans law:
  - NOT (A or B) = Not a and not b
  - NOT (A and B) = Not a or not b

Script	if not(a and b):
	if (not a) or (not b):
	
	if not(a or b):
	if (not a) and (not b):

ELIF

- If statements are based around Boolean logic as returned statement must be true or false
- Else if – allows for checking multiple branches

Script	**# Traffic light instructions**
	color = input(“Please enter color of light: ”)
	if color == ‘red’:
	print(“Stop!”)
	elif color == ‘yellow’:
	print(“Slow down…”)
	elif color == ‘green’:
	print(“Go go go!”)
	else:
	print(“I don’t know the color ‘{0}’”.format(color))

Script	number = int(input(“Please enter a number: ”))
	color = input(“Please enter a color: ”)
	
	if color == ‘blue’:
	  if number < 5:
	  print(“blue, less than 5”)
	  elif num == 8:
	  print(“blue, 8”)
	  else:
	  print(“blue, greater than 4 but not 8”)

TERNARY CONDITIONAL EXPRESSIONS

- Providing one value or another based on result of condition
- Shorted one-line version
- <true value> if <condition> else <false value>

Script	molecule = “dna” if values == 4 else “protein” animal = “cow” if sound == “moo” else “honey badger” constant = 2.718 if name=“euler” else 3.141

TIPS WITH LOOPS

- Avoid complexity:
  - Deeply nested if statements - try to avoid more than a single nest
  - Complex Boolean operations - very easy to get the logic wrong
  - Either of these can lead to bugs that only appear under certain scenarios, making them difficult to troubleshoot
- Be aware of functionality that should be mutually exclusive these scenarios should utilize elif/else statements
- When looking through online help, be sure not to confuse logical Boolean operations with bitwise operations
  - Both have ANDs, ORs, NOTs

LAB GOALS

- Create a script that uses:
  - elif
- Create a run a script that uses:
  - A ternary conditional expression
- Create and run a script that uses:
  - Boolean priciples
  - If/else statement