CIRCUITS AND ELECTRONICS : ANALOG AND DIGITAL

Names: _____

Instructions: Copy and Complete this document and post a link from your class site. (One form per group)
Use https://replit.com/

Value: 5 points

- 3 pts : Exercises are correct or at least attempted for full credit.
- 2 pt : Relatively equal participation from both partners

Learning Goals:

- Review!
- Lists
- For loops
- Dictionaries
- While loops
- Python Errors

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1. Review

Using repl.it create the following:
(Refer back to the first set of exercises if you don't remember how to do this)

Create four variables

- Your name
- Your partner's name
- How many siblings you have
- Your partner's total siblings

Create a statement that prints each person's name, how many siblings and who has more by how many.
Example: Dusty has 4 siblings, and Zuma has 1 sibling. Dusty has 3 more siblings than Zuma.

Screenshot your code here:

When do you indent a line in python?

2. Lists

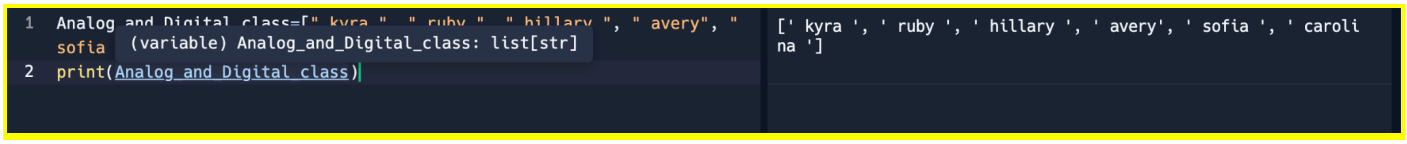
A list is a variable with multiple values - see an example

```
my_schedule = ["D&T", "English", "Biology"]
```

Using repl.it create the following:

- Make a list with six people's names in this class.
- Print the list

Screenshot your code here:



Next: Lists allow you to access specific data items. Example

- Print only the first item in your list. (Keep in mind that the first item is 0, not 1 , no need to use a loop yet)

```
1 Analog_and_Digital_class=[" kyra ", " ruby ", " hillary ", " avery", "
  sofia ", " carolina "]
2 print(Analog_and_Digital_class[0])
3
```

- In another line, print only the last item in your list by negative index

```
main.py > ...
1 Analog_and_Digital_class=[" kyra ", " ruby ", " hillary ", " avery", "
  sofia ", " carolina "]
2 print(Analog_and_Digital_class[5])
3
```

ing.

Sometimes, you might need to know how long a list is. See how to print the length of a list

- Add a third line to print the length of your list.

```
main.py
main.py > ...
1 Analog_and_Digital_class=[" kyra ", " ruby ", " hillary ", " avery", "
  sofia ", " carolina "]
2 print (len(Analog_and_Digital_class))
3
```

Screenshot your code here:

You can change items in a list. See how here
You can also add or insert items to a list. See how here

Using repl.it create the following:

- Keep using the list of names you had in the last sketch.
- Create a NEW list with two new names from the class
- Using list indexing, CHANGE the center of the original list to include the 2nd of the two new names and print the revised list

Screenshot your code here:

```
1  Analog_and_Digital_class=[" kyra ", " ruby ", " hillary ", " avery", "
   sofia ", " carolina "]
2  new_names=[" natalie ", " brandon "]
3  Analog_and_Digital_class.insert(3," natalie ")
4  print (Analog_and_Digital_class)
```

There's so much more you can do with lists. Look at the common list methods

- Create a list of favorite shows
- Create a sketch that uses reverse, sort, and one other method.
- Print out the results

Screenshot your code here:

```
1  favorite_shows=[" gossip_girl ", " bojack_horseman ", " adventure_time
   ", " friends ", " criminal_minds "]
2  favorite_shows.reverse()
3  print(favorite_shows)
4  favorite_shows.sort(reverse=True)
5  print(favorite_shows)
6  favorite_shows.insert(5,"schitts_creek")
```

```
(__index: SupportsIndex, __obje
None
```

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3. For Loops

Look at these examples using a for loop to print everything in a list.

Using repl.it create the following:

- Use the list of names you used in the last exercise
- Create a 2nd list with present tense verbs that these people might engage in. (example: “jumps”)
- Use a for loop to print your list of first names
- Use the range function command to print only names indexed at 2 - 5
- Use a nested loop to print each first names along with each of the verbs.

Screenshot your code here:

```
names=[" hillary ", " kyra
avery "]
verbs=[" jumps ", " runs ",
for y in verbs:
  for x in names
  print
for y in range (2, 5):
  print (names[y])
```

```
1  names=[" hillary ", " kyra ", " sofia ", " ruby ", " carolina ", "
   avery "]
2  verbs=[" jumps ", " runs ", " screams ", " cries "]
3  for y in verbs:
4    for x in names:
5      print (x,y)
```

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4. Dictionaries

Dictionaries allow for more complex data objects in which data is represented in key:value pairs.
[Read here]

```
city_worker = {
  "name": "Elmer",
  "career": "Plumber",
  "age": 99,
  "Available": True
}
```

Create a dictionary that has data about a movie you and your partner like. Create at least five key:value pairs for the dictionary.

- Print the entire dictionary.
- Print only two Key Values from your dictionary. example

Screenshot your code here:

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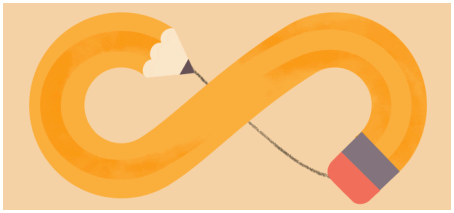
5. While Loops



"While loops" do something as long as a condition is true. See examples here
We will frequently use the statement "while True" to repeat something forever.

Try this:

```
import time
hello=1

while True:
  print(hello)
  hello=hello+1
  time.sleep(1)
```

hello+=1 is a shorter and equivalent way to write which statement above?

- Create a similar sketch where you count up by fives. When the number is over 50,000 you use the break command to end the loop.

Screenshot your code here:

- How can you do the same thing with even less code?

6. Python Errors

Python errors can be helpful if you know what they mean.

- Paste this code into replit.

```
city_worker = {
  "name": "Elmer",
  "career": "Plumber",
  "age": 99,
  "Available": True
}

print(city_worker["mood"])
```

What error do you get and what does it mean:

- Paste this code into replit. What error do you get and what does it mean:

```
rat = 100
cats = 52
print(dogs)
```

What error do you get and what does it mean:

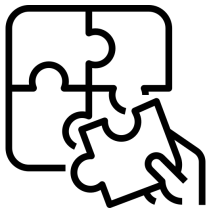
- Paste this code into replit. What error do you get and what does it mean:

```
word = "hello"
for x in range(0,6):
  print(word[x])
```

What error do you get and what does it mean:

For those who have some extra time:

Can you figure out any part of this puzzle?



1. Find an online resource that shows you how to randomize values.
2. Create a list of seven kinds of cereal.
3. Create a list of seven people.
4. Create a loop that grabs a random name and a random cereal to make a sentence that say “This [person] ate [cereal name] today.”
5. Have this loop run every 0.5 seconds
6. Add a couple of statements at the end that keep track of how many times the loop has run, and print it in a statement of some kind.

Optional: Keep track of how many times a cereal is eaten. If a cereal comes up 5 times, can you remove it from the list because the box is empty? Hint: This means your random number will need to be based on the length of the list and not on a static number.

Screenshot your code here: