Example: How to Store Student Info

•so far, can store using separate lists for every info

```
names = ['Ana', 'John', 'Denise', 'Katy']
grade = ['B', 'A+', 'A', 'A']
course = [2.00, 6.0001, 20.002, 9.01]
```

- •a separate list for each item
- •each list must have the same length
- •info stored across lists at same index

Python Tuples

- an ordered sequence of elements, can be mix element types
- cannot change element values, immutable
- create a tuple with **parentheses**

```
thistuple = () # a empty tuple
thistuple = ("apple", "banana", "cherry")
```

access tuple items by referring to the index number

```
thistuple=(2,"mit",3)
thistuple[0]
```

→ evaluates to 2

Python Tuples

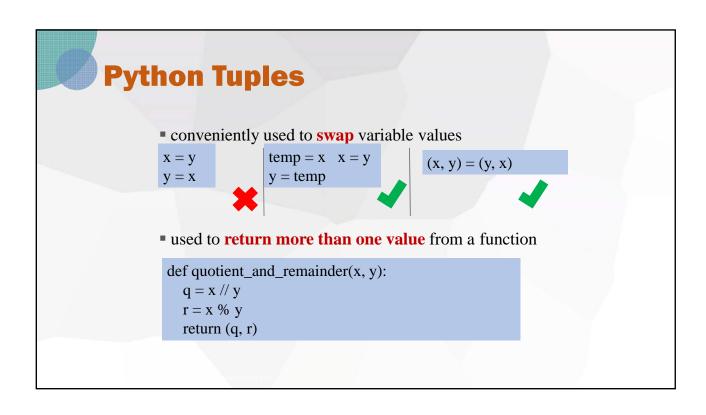
• negative indexing means **beginning from the end**, -1 refers to the last item

```
thistuple = ("apple", "banana", "cherry")
print(thistuple[-1])
```

slice a range of indexes by specifying start and end

```
thistuple = (2,"mit",3)
thistuple[1:2] → slice tuple, evaluates to ("mit")

→ slice tuple, evaluates to ("mit",3)
```



Packing/unpacking

• Tuple packing is used to "pack" a collection of items into a tuple. We can unpack a tuple using Python's multiple assignment feature.

```
s =("Susan", 19, "CS") # tuple packing
name, age, major = s # tuple unpacking
print(name)
print(age)
print(major)
```

Susan

19

CS

When to use Tuples

- When storing elements that will not need to be changed.
- When you want to store your data in logical immutable pairs, triples, etc.