AUBURN
ENGINEERING

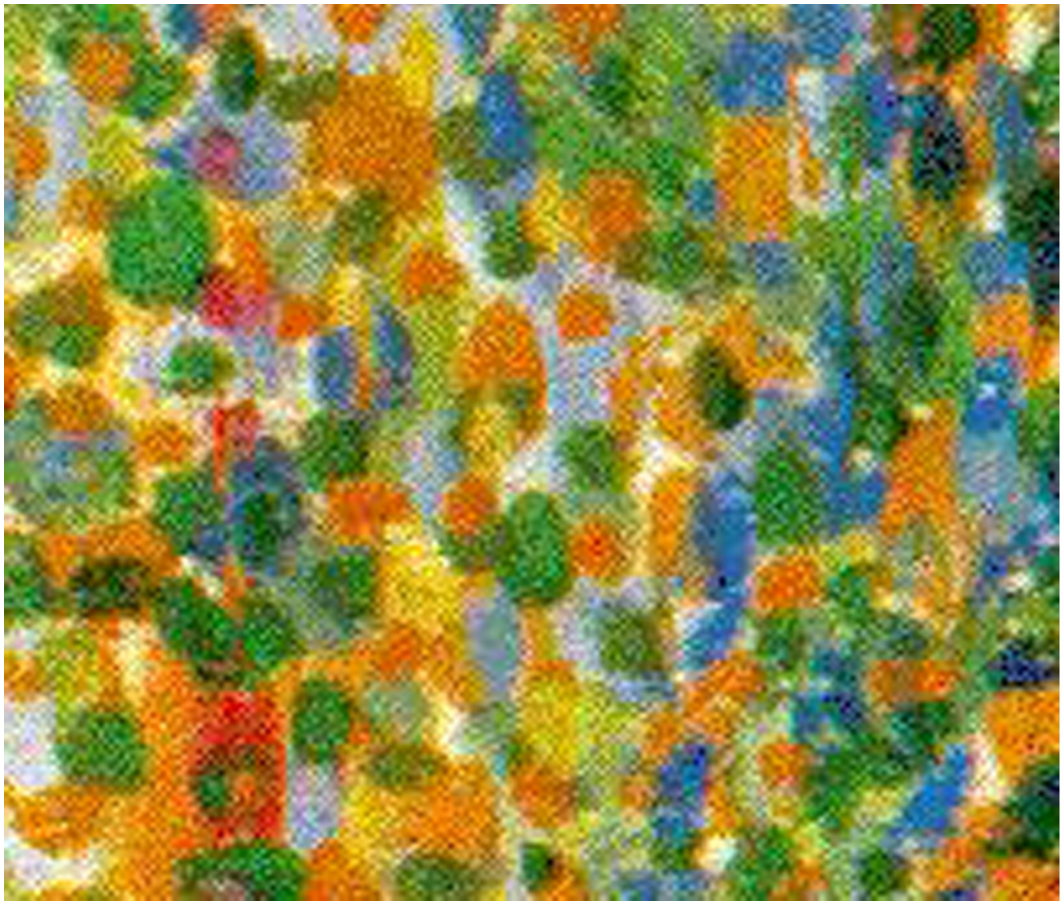
ENGR 1110

Module 3 Lecture

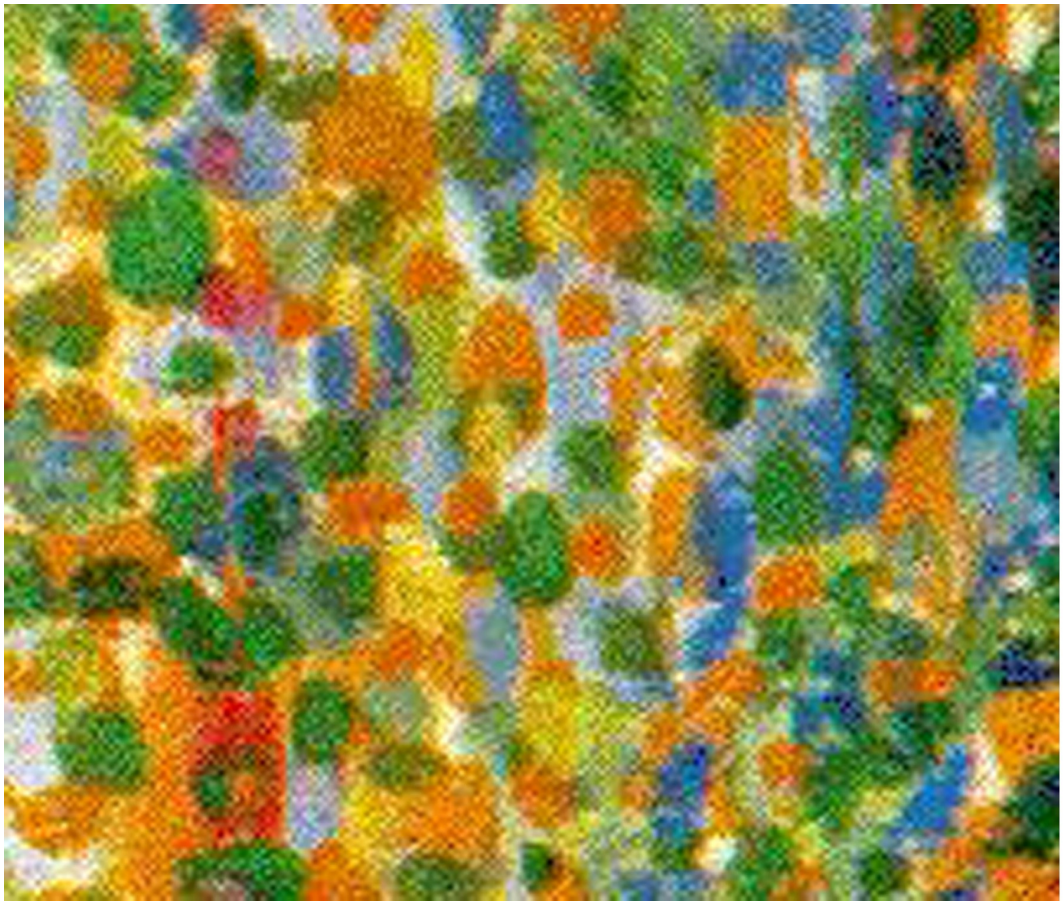
Workflow & Due Dates

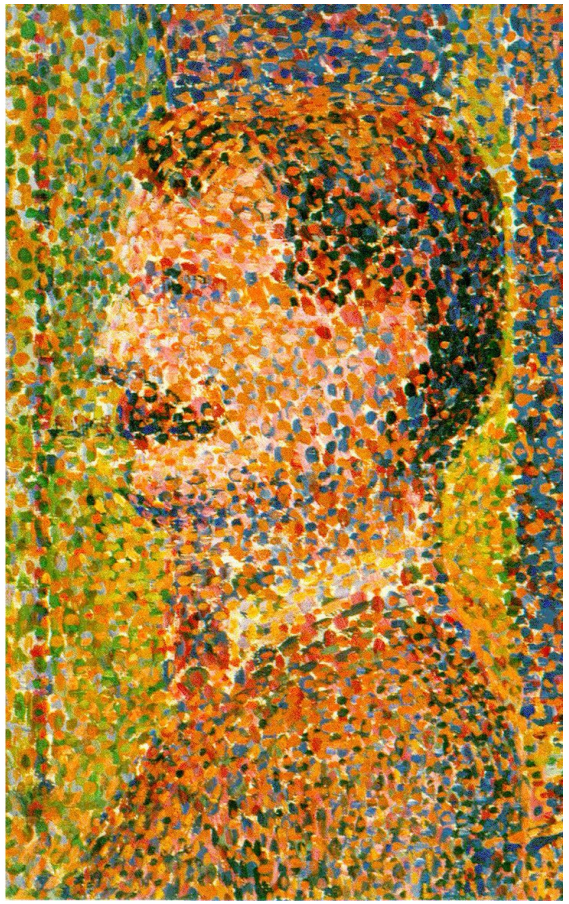
Showing activity for entire class	zyLabs	Challenge	Participation
1. Spreadsheets		83%	97%
2. Introduction to Python	91%	84%	95%
3. Variables and Expressions	92%	84%	93%
4. Types	85%	80%	70%

See the forest *and* the trees…



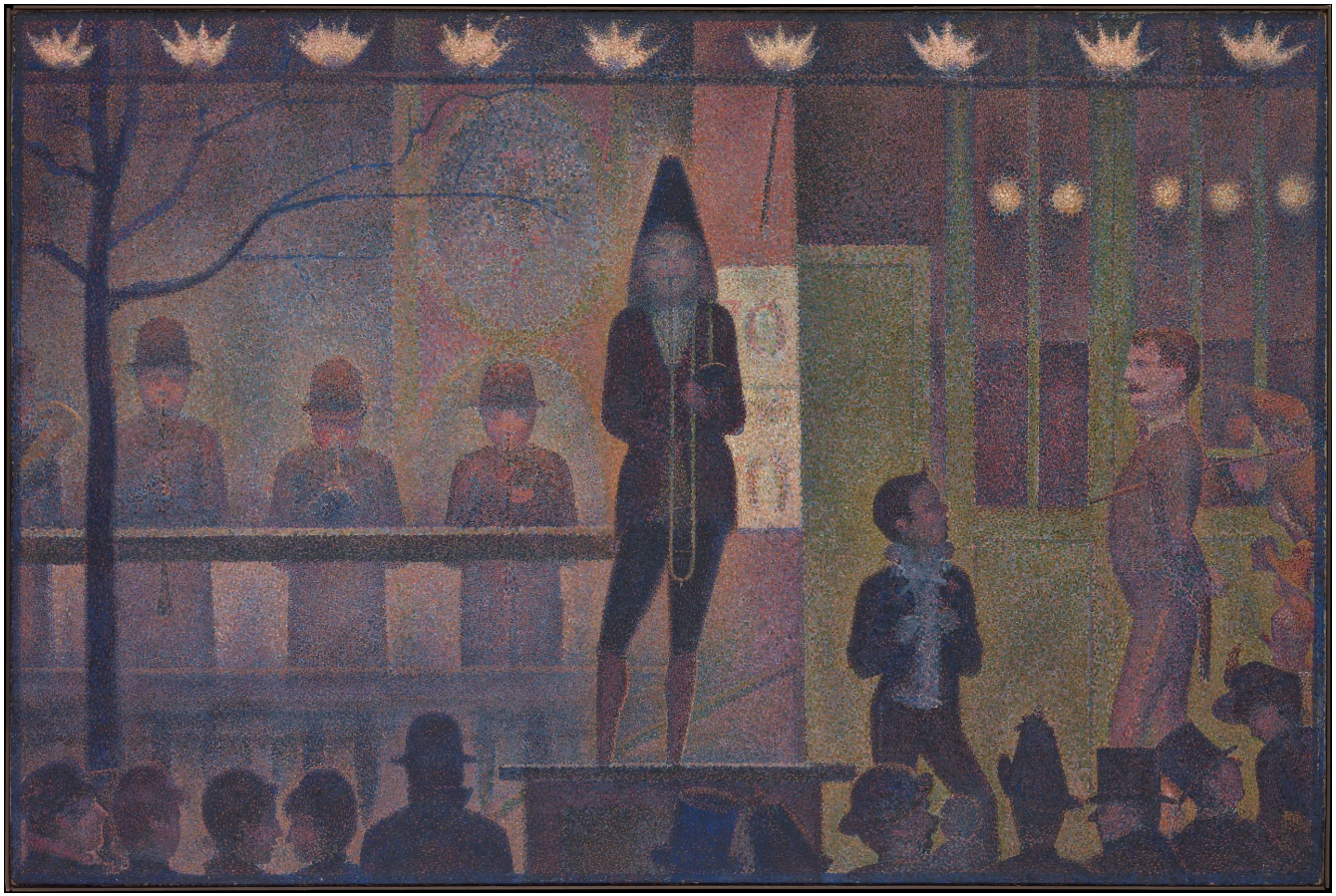
See the forest *and* the trees…





https://www.principlegallery.com/technique-tuesday-pointillism-take-two/

See the forest *and* the trees…



Georges Seurat, *Parade de Cirque*, 1887-88, Public domain, via Wikimedia Commons

See the forest *and* the trees…

Georges Seurat, *A Sunday Afternoon on the Island of La Grande Jatte*, 1884-86, Public domain, via Wikimedia Commons

Programming fundamentals

Consume input, Create output Ch 2: Intro to Python

Remember things

Calculate things

} Ch 3 & 4: Variables, Expressions, Types, Strings, Lists, Sets, Tuples, Dictionaries

Make things happen in sequence Ch 2, 3, 4

Ask a question, decide what to do based on answer Ch 5: Branching

Make things happen repeatedly Ch 6: Loops

zyBook

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ENGR 1110:
Introduction to
Software Engineering

Multiple instructors
SPRING 2024

Chapter 5. Branching

5) Branching

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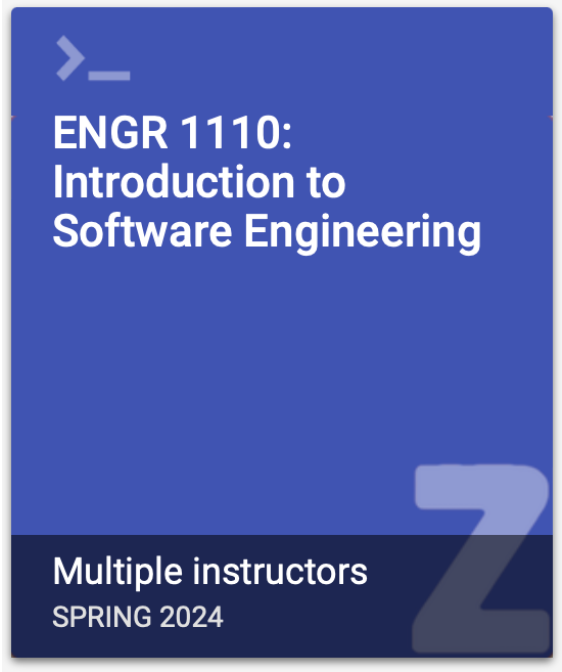

Chapter 5. Branching

5) Branching

Ch 5 Branching – Lab 5.15

5.15 LAB: Interstate highway numbers

Primary U.S. interstate highways are numbered 1-99. Odd numbers (like the 5 or 95) go north/south, and evens (like the 10 or 90) go east/west. Auxiliary highways are numbered 100-999, and service the primary highway indicated by the rightmost two digits. Thus, I-405 services I-5, and I-290 services I-90. Note: 200 is not a valid auxiliary highway because 00 is not a valid primary highway number.

Given a highway number, indicate whether it is a primary or auxiliary highway. If auxiliary, indicate what primary highway it serves. Also indicate if the (primary) highway runs north/south or east/west.

Ex: If the input is:

```
90
```

the output is:

```
I-90 is primary, going east/west.
```

Ch 5 Branching – Lab 5.15

```
    hwy_num = int(input())
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())









# create the output
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())









# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""









# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway




# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway

# set the direction of the highway



# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway

# set the direction of the highway

# calculate the primary highway for an auxiliary

# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway

if the value of hwy_num is between 1 and 99
then kind should be “primary”
but if the value of hwy_num is between 100 and 999 and not a multiple of 100
then kind should be “auxiliary”
otherwise, kind should be “not a valid interstate highway number”
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the direction of the highway
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the direction of the highway

if kind is either “primary” or “auxiliary”
then we need to do the following:
    prefix should be “I-”
    if hwy_num is even
    then direction should be “, going east/west”
    otherwise, direction should be “, going north/south”
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# calculate the primary highway for an auxiliary
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# calculate the primary highway for an auxiliary

if kind is “auxiliary”
then serving should be “, serving I-” + str(hwy_num % 100)
```

Ch 5 Branching – Lab 5.15

```
hwy_num = int(input())
kind = ""
prefix = ""
serving = ""
direction= ""

# set the kind of interstate highway
if 1 <= hwy_num <= 99:
    kind = "primary"
elif (99 < hwy_num <= 999) and (1 <= (hwy_num % 100) <= 99):
    kind = "auxiliary"
else:
    kind ="not a valid interstate highway number"

# set the direction of the highway
if (kind == "primary") or (kind == "auxiliary"):
    prefix = "I-"
    if (hwy_num % 2 == 0):
        direction = ", going east/west"
    else:
        direction = ", going north/south"

# calculate the primary highway for an auxiliary
if (kind == "auxiliary"):
    serving = ", serving I-" + str(hwy_num %100)

# create the output
print(f"{prefix}{hwy_num} is {kind}{serving}{direction}.")
```