



COMP 150: Midterm Review

Week 08, Midterm Review



Midterms

- Solutions - Written
- Solutions - Practical
- Statistics
- Next

Written - Problem 1

```
a = 5  
b = 10  
c = -5  
d = 0
```

```
t = true  
f = false
```

```
a > b      = False
```

```
d >= a     = False
```

```
f == f     = True
```

```
t == 1     = True
```

```
t > f      = True
```

```
t && t      = True
```

```
t && f      = False
```

```
f && f      = False
```

```
f || f     = False
```

```
t || f     = True
```

```
(t || f) && t      = True
```

```
(t && t) && t      = True
```

```
(f || f) || f     = False
```

```
(t || f) && f     = False
```

Written - Problem 2

```
z = 500
if (z > 1000) {
    print("A")
}
else if (z > 25) && (z < 400) {
    print("B")
}
else {
    print("C")
}
```

"C"

Written - Problem 2

```
for i in range(0, 10):  
    print(i)
```

0, 1, 2, 3, 4, 5, 6, 7, 8, 9

```
for i in range(0, 10):  
    print(i * 2)
```

0, 2, 4, 6, 8, 10, 12, 14, 16, 18

Written - Problem 2

```
for i in range(0, 10):  
    if (i == 2) or (i == 5):  
        print(i * 10)  
    else:  
        print(i)
```

0, 1, 20, 3, 4, 50, 6, 7, 8, 9

Written - Problem 3

Discuss the innovation that allowed computers to get both significantly smaller and more powerful.

- Transistors
- Good to mention the size
- Good to mention when (50s)

Written - Problem 4

Discuss mainframe computers. You might consider discussing when they were popular, their architecture, how they were used, and how they scale.

- Large machine in a different room
- Popular in the 60s-80s
- Still around today
- Terminals (many-user, illusion of exclusivity)
- Scaling is easy - bring in more mainframe

Written - Problem 5

Discuss how the move from large, purpose-built computers to mainframe computers allowed programmers, users, and computer administrators to become more specialized professions.

- No longer require electrical engineering or mechanical knowledge
- Allowed programmers to program, engineers to engineer, administrators to administrate
- Opened computers further to the general user (accountants, bankers, brokers, etc)
- Specialization meant faster progress for each field and ease of adoption

Written - Problem 6

Discuss supercomputers. You might consider discussing how users interact with them, how they scale, and their purpose compared to other types of computers.

- Large machines
- Changed through the years (special-purpose to general and now back to specialized)
- Intended for massive computations, science, etc
- Scale by building more rows
- User interacts by writing programs elsewhere and submitting jobs

Written - Problem 7

Discuss the PC. Consider discussing the architecture of a PC, how they scale, and when they became popular.

- Personal computers
- Took off in the 90s, everywhere in the 00s
- Everything on one board/box
- Scaling is negligible - replace or upgrade (via replacement)

Written - Problem 8

Describe the basic functionality of the internet. Specifically include ISPs, DNS, and packets. Feel free to draw a picture, but include a paragraph to describe what you're showing.

- Internet allows data to be sent globally
- Packets = unit of information
- ISP = internet service provider, allow access
- DNS = domain name service, navigation

Written - Problem 9

What was the purpose of ARPANET/NSFNET, and how did this differ from the Internet (World-Wide Web, or WWW)?

- ARPANET/NSFNET = research institutions and military, simply data, intra-US
- WWW = global (CERN), hypertext (pages of a book)

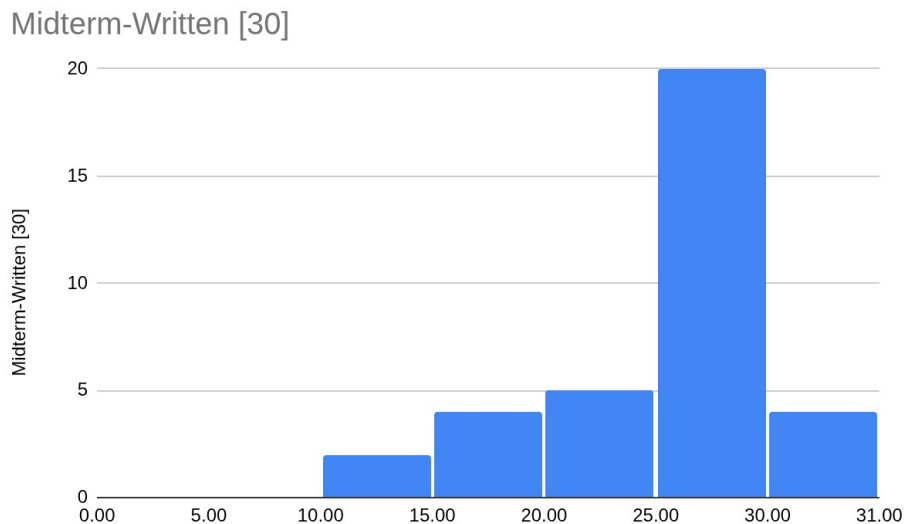
Written - Problem 10

How has the use of the Internet changed over the decades? Consider discussing web browsers and interactivity.

- Early: just data, phone lines
- Mid: hypertext, pages of a book, links and text (no dynamism)
- Now: interactive
- Could also discuss the client/server interaction:
 - Then: data sent, rendered locally, interaction required communication
 - Now: mini version of web server local, interaction might not require communication

Written Midterm: Statistics

- 30 total points
 - Rounded up for problems 1 and 2



Practical - Problem 1

```
# Problem 1
# Create the following datatypes, and store them as variables:
#   String
#   Integer
#   Boolean
#   List      - make sure there are at least 3 elements
#   Dictionary - make sure there are at least 3 key-value pairs
# Points:
# 0 : nothing attempted
# +1: correct string
# +1: correct int
# +1: correct bool
# +1: correct list
# +1: correct dict
```

Practical - Problem 2

```
# Problem 2
# Given the provided list, print each value multiplied by
two
# Use a for loop
# Points:
# 0 : nothing attempted
# +1: tried anything
# +1: used a for loop
# +1: printed values
# +1: printed values * 2
# +1: worked perfectly
```

Practical - Problem 3

```
# Problem 3
# Given the provided list, print the value and its description as follows:
# Indicate whether a value is small (equal to one),
# medium (between one and five),
# or large (greater than or equal to five).
# Use a for loop and an if-elif-else statement.
# Within the if-elif-else statement, use format strings of the forms:
# "The value, {}, is small",
# "The value, {}, is medium", or
# "The value, {}, is large"
# Points:
# 0 : nothing attempted
# +1: used a for loop
# +1: used if-elif-else
# +1: case 1 correct
# +1: case 2 correct
# +1: case 3 correct
# +1: correctly used format strings or similar
# +1: entire thing correct
```

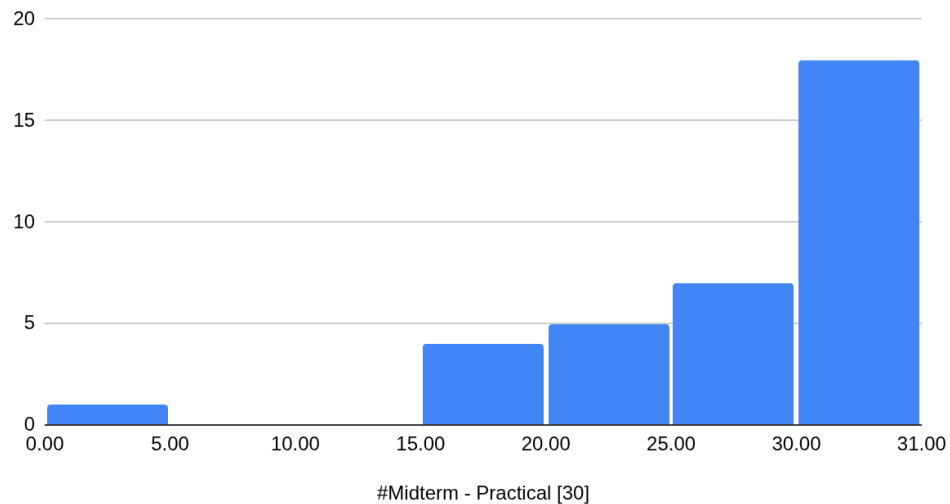
Practical - Problem 4

```
# Problem 4
# Given the provided dictionary, for each key (use a for loop), do the following:
# Print the key
# Print the value
# If the value is even, print "This value is even"
# If it is odd, print "The value is odd"
# Use a for loop and if-else statements
# You can use multiple print statements.
# You do not have to use format strings for this one (though you're welcome to).
# Points:
# 0 : nothing attempted
# +1: used a for loop
# +1: key printed
# +1: value printed
# +1: case odd correct
# +1: case even correct
# +1: correctly printed using whatever
# +1: used ONLY ONE for loop or call to .keys() or .values()
# +1: entire thing correct
```

Practical Midterm: Statistics

● 30 total points

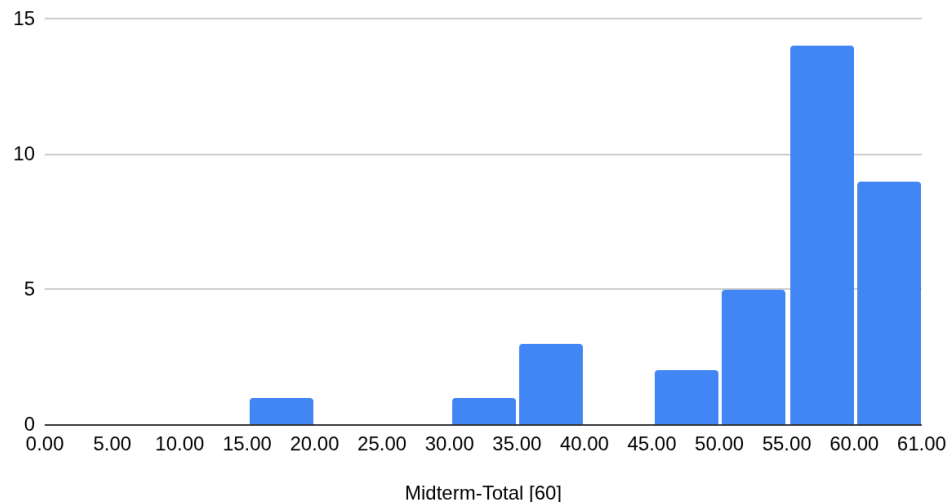
Histogram of #Midterm - Practical [30]



Overall Midterm: Statistics

- 60 total points
- 10% curve applied to lower-scoring half

Histogram of Midterm-Total [60]

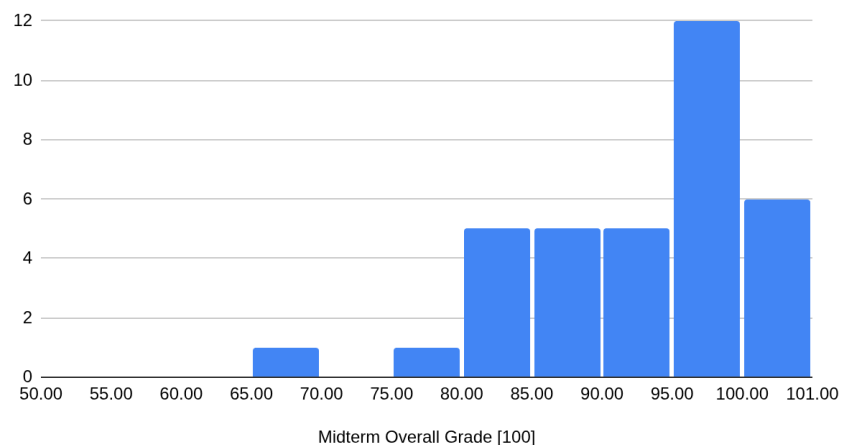


Overall Midterm Grades

- 10 pts: Attendance
- 15 pts: Labs
 - Completion up until now
- 20 pts: Midterm

You guys are doing great!

Histogram of Midterm Overall Grade [100]



Up Next

- Interactivity
- Layering
- Project
- Midterm II:
 - Likely presentation-based + practical
- Final
 - Same format as Midterm I (written + practical)
- Fun Topics:
 - History of cyberattacks
 - Ethical AI
 - =)