

Name: _____ **Section:** _____ **Practice Exam2: input, output, if, loops, vectors, figures.**

As a reminder, no credit is given to a method that has not yet been taught. Baby steps....

I do not answer questions the first hour (unless related to machine issues).

As each city continues to clear up hurricane debris to different disposal sites, weekly updates are provided to the residents. Determine which disposal site should be used more, depending on cubic yard data provided by the trucks: Daytona Beach, or Port Orange?

```
*<<<<< Oh wonderful hurricane debris collection >>>>>*
```

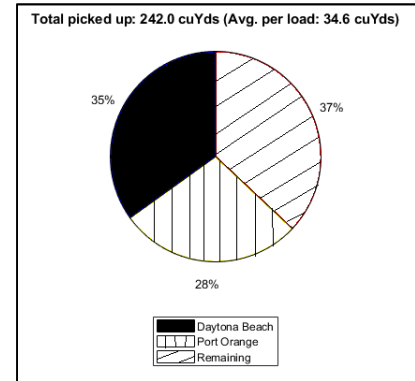
```
How many trucks are operating (>5): -1
  ERROR (whole>5). try again -->: 0
  ERROR (whole>5). try again -->:
  ERROR (whole>5). try again -->: 6.6
  ERROR (whole>5). try again -->: 5
  ERROR (whole>5). try again -->: 7
```

```
Dump Site Data:
```

Truck # 1:	36.3 cuYds	Port Orange
Truck # 2:	33.4 cuYds	Port Orange
Truck # 3: Daytona Beach	35.9 cuYds	
Truck # 4: Daytona Beach	36.3 cuYds	
Truck # 5:	38.1 cuYds	Port Orange
Truck # 6: Daytona Beach	31.6 cuYds	
Truck # 7: Daytona Beach	30.4 cuYds	

```
*-----*
              ( 134.2cuYds)              ( 107.9cuYds)
Daytona Beach got 1.24 times what Port Orange got,
start going more to Port Orange...
```

← A sample run



Your figure will have 3 colors. Color printing is more \$\$\$ so I made sure you could see on B&W printing.

Code Requirements:

An intro message is always required.

The number of trucks is a user input. **Trap** while invalid. What is considered invalid is shown in the sample run above.

The amount of cubic yard of each truck is automatically generated by MATLAB: a random **float** between 30 and 40.

Whether the truck went to Daytona Beach or Port Orange is also determined by MATLAB each time: generate a random **integer** 1 or 2. As the programmer, you decide: one value means Daytona Beach, the other means Port Orange.

$$factor = \frac{\text{sum of cubic yards that went to Daytona Beach}}{\text{sum of cubic yards that went to Port Orange}}$$

To determine which disposal site the trucks should start going to: based on the equation above, if $factor > 1.2$ go to Port Orange, if the $factor < 0.8$, go to Daytona Beach. Anything in between means the disposal sites are being used equally. One of those 3 options should display.

To simulate a fake value of cubic yards that remain to be picked up, MATLAB will generate a random percentage (float) between 50 to 80% of what has already been picked up.

Requirements for the command window display:

It is crucial the output looks professional and spaced out as in all our labs.

- 1) The truck's number (1,2,3,... Etc) must show.
- 2) A clear visual of whether the truck went to Daytona Beach or Port Orange is required (You do not have to match my sample run, but it must be OBVIOUS and somewhat a table looking output).
- 3) However you decide to show the values, the cubic yard values must align at the decimal point.
- 4) Units are required everywhere. All values show the same amount of decimals (your choice, at least >1).
- 5) Once calculated, the total cubic yards of each site must also show (At your preference where and how.)
- 6) The factor and where the trucks should now go must display.

Requirements for the pie graph display: Use `pie(yourvector)`; where the vector has the two total cubic yards for each site, as well as the remaining cubic yards. Create a dynamic title that shows the total picked up and the average per truck load. Add a legend just like you would to a `plot()` command.

Check list – read before starting

EVERY LINE COUNTS. EVEN IF COMMENTED OUT BECAUSE SOMETHING ABOVE IT CRASHES.

The basic:

- 5pts Valid Filename (up to you)
- 10pts Code runs. Comment out what crashes but leave it!
- 6pts Name, section, valid description
- 2pts each Necessary clean up commands
- 10pts Complete algorithm as comments – requires no programming knowledge. Just English.**
- 10pts Descriptive variable names. NO single letters except for the loop control variable.
- 10pts Space out the code as shown in all examples/solutions. Be consistent.
- 5pts Proper use of semi-colons. (0 or 5pts. 1 rule to know)
- 5pts A valid intro message
- 10pts Human factor: space out the output. Lots of `\n\n`, tabs, spaces, field widths.

The solution:

- 5pts Ask user for quantity of trucks
- 10pts Trap for all invalid options
- 10pts Loop to display each truck data (loop of your choice)
- 5pts Generate random cubic yard
- 5pts Generate random site for the truck
- 10pts Correct displays, numbers align, obvious disposal site
- 10pts Adding up the cubic yards on the correct sites
- 5pts Display the total cubic yards of each site
- 5pts Determine factor
- 10pts Correct display of factor and where trucks should go
- 10pts Create pie chart, legend
- 5pts Correct calculate average
- 5pts Dynamic title shows the correct data
- 10pts Leeway

The engineer:

- Step7c. At least two. Located at bottom of the script file. If something looks off, write a note!
Do not wait until the code runs to do this. Even fully testing your trap loop is 1 valid test.
Crash tests are ok too if towards the end of the time (then comment what crashes before submitting).
- 10pts 1 test must show the loop traps ALL invalid values in one run.
- 10pts Another test for the overall code