EXAM 1 – WRITTEN PORTION

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Written Portion	/ 44
Computer Portion	/ 56
Total	/ 100

USE MATLAB SYNTAX FOR ALL PROGRAMS AND COMMANDS YOU WRITE

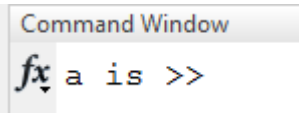
Problem 1: (4 points) We have loaded a matrix called `pressuredata`. We wish to copy the 7th column of that matrix into a new vector called `tap7`. Complete the code scrap below to accomplish this task:

```
[nrows ncols]=size(pressuredata);
for i=1:nrows
    tap7(_____________)=pressuredata(_________________);
end
```

Problem 2: (4 points) Consider the code scrap shown below:

```
a=7;
b=4*a;
fprintf('a is %1.0f and b is %2.0f \n');
```

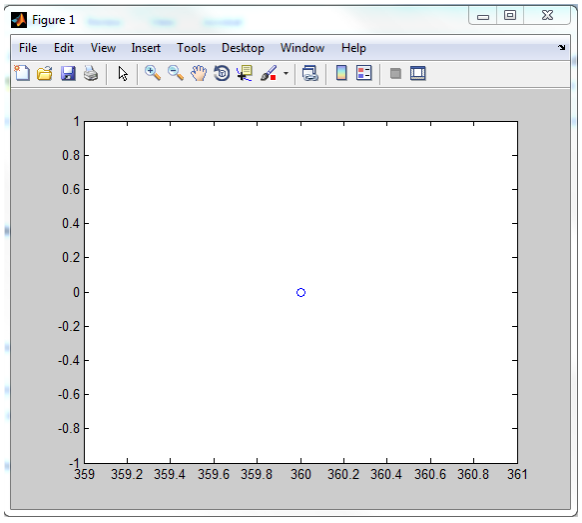
It is supposed to print the values of a and b to the command window, but instead we simply see



On the code, mark the change(s) required to make the code perform correctly.

Problem 3: (4 points) The code below is supposed to plot a sine curve, but we just get the figure shown to the right. Mark the change(s) on the code to make the code work correctly.

```
clc
clear variables
close all
index=1;
for theta=0:5:360
    theta_vec(index)=theta;
    sine_vec(index)=sind(theta);
end
plot(theta_vec,sine_vec,'o')
```



Problem 4: (4 points) We wish to calculate the sum

$$y = \sum_{x=1}^{20} \frac{1}{x^3}$$

In the space below write the code to accomplish this task

Problem 5: (4 points) What will print when we run this code?

```
clc
clear variables
cats=4;
dogs=1;
if (cats > dogs)
    fprintf('I have more cats than dogs \n');
elseif (cats == dogs)
    fprintf('I have the same number of cats as dogs \n');
elseif (cats > (dogs+2))
    fprintf('I have a lot more cats than dogs \n');
else
    fprintf('I have more dogs than cats \n');
end
```

(a) `I have more cats than dogs`
(b) `I have the same number of cats as dogs`
(c) `I have a lot more cats than dogs`
(d) `I have more dogs than cats`
(e) None of the above (explain)

Problem 6: (4 points) We have loaded a matrix called `pressuredata`. We wish to copy every 5th row of the last column of that matrix into a new vector called `small_vector`. Complete the code scrap below to accomplish this task:

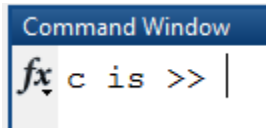
```
[nrows ncols]=size(pressuredata);
counter=0;
for i=1:5:nrows
    counter=counter+1;

small_vector(___________)=pressuredata(_______________);
end
```

Problem 7: (4 points) This code scrap

```
clc
clear variables
c=25;
fprintf('c is %2.0 \n',c);
```

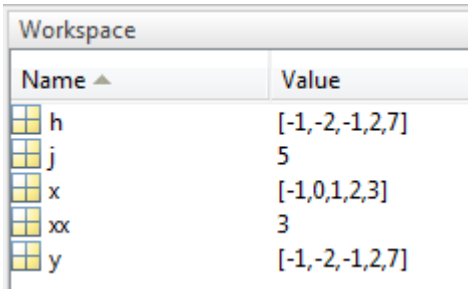
is supposed to print the value of c but instead we just see



Fix the code so that it performs correctly.

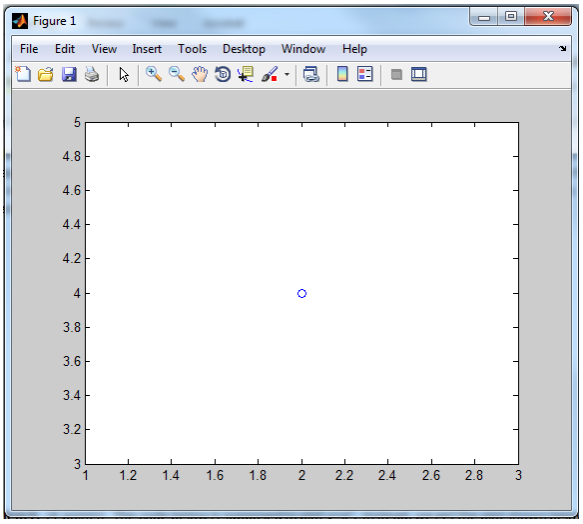
Problem 8: (4 points) The code scrap below is supposed to create two vectors, x and y, and then put the larger of the two vectors into a third vector h. However, when we examine the workspace after the code runs, we see that h just came out the same as y. Mark the change(s) on the code so that it runs correctly.

```
clc
clear variables
j=0;
for xx=-1:3
    j=j+1;
    x(j)=xx;
    y(j)=xx^2-2;
    if (x > y)
        h(j)=x(j);
    else
        h(j)=y(j);
    end
end
```



Problem 9: (4 points) The code below is supposed to plot $y=x^2$. Instead, we get the plot shown below (right). Mark the change(s) on the code so that the curve plots correctly.

```
clc
clear variables
close all
j=0;
for xx=0:.01:2
    j=j+1;
    x(j)=xx;
    y(j)=xx^2;
end
plot(x(j),y(j),'o')
```



Problem 10: (4 points) The code below prints a table of values. All of the values are correct (below, right) but the second column is not aligned correctly (ones digits above each other). Mark the change(s) on the code to make the table line up correctly.

```
clc
clear variables
fprintf('\n i   i^4  \n');
fprintf('-----------\n');
for i=1:4
    fprintf(' %1.0f   %2.0f \n',i,i^4);
end
```

Command Window

```
 i   i^4
-----------
 1    1
 2   16
 3   81
 4   256
fx >>
```

Problem 11: (4 points) The code below creates two functions: $f=x^2$ and $g=x^3-1$. Then we wish to plot the functions, but we get an error. Mark the change(s) on the code to make it run correctly.

```
clc
clear variables
close all
counter=1;
for x=0:.01:2
    x_vec(counter)=x;
    f(counter)=x^2;
    g(counter)=x^3-1;
    counter=counter+1;
end
plot(x_vec,f,g)
```

Command Window

```
Error using plot
Data must be a single matrix Y or a
list of pairs X,Y

Error in written (line 51)
plot(x_vec,f,g)

fx >>
```