EOSC 211 – Week10 – Worksheet – Debugging

Group #
Name

Exercise 1: Decide what the code fragment is trying to do, and how to fix the error so it performs the required task.

runexample.m:

```
A=rand(10,5); % creates a 10x5 matrix containing random numbers

rowsum=0;
for k=1:size(A,1),
  rowsum=rowsum+A(:,k);
end;
```

```
>> runexample;
??? Attempted to access A(:,6); index out of bounds because size(A)=[10,5].

>> help rand
 RAND Uniformly distributed pseudorandom numbers.
    R = RAND(N) returns an N-by-N matrix containing pseudorandom values drawn
    from the standard uniform distribution on the open interval(0,1).  RAND(M,N)
    or RAND([M,N]) returns an M-by-N matrix.  RAND(M,N,P,...) or
    RAND([M,N,P,...]) returns an M-by-N-by-P-by-... array.  RAND returns a
    scalar.  RAND(SIZE(A)) returns an array the same size as A.
 [...]
```

Exercise 2: This code is supposed to create a running standard deviation. Does it? If it doesn't, state why. If not, what is the problem?

runexample2.m:

```
X=rand(1,10)
for k=1:length(X),
  Y(k)=std(X(max(1,k-3)):X(min(length(X),k+3)));
end;
```

```
>> runexample2;
X =
    0.7513 0.2551 0.5060 0.6991 0.8909 0.9593 0.5472 0.1386 0.1493 0.2575
>>  Y
Y =
    NaN     0     0   NaN   NaN   NaN   NaN   NaN   NaN   NaN
>> help std
 STD Standard deviation.
    For vectors, Y = STD(X) returns the standard deviation.  For matrices,
[...]
    STD normalizes Y by (N-1), where N is the sample size.  This is the
    sqrt of an unbiased estimator of the variance of the population from
    which X is drawn, as long as X consists of independent, identically
    distributed samples.
```

EOSC 211 – Week10 – Worksheet – Debugging

Exercise 3: What do you see on the screen when you run this code (after fixing the error)?

runexample3.m:

```
x=5; i=3;
for j=1:5,
 i=i-1;
 if j=4,
  x=x+4;
   end;
end;
[i x-3]
```

```
>> runexample3
??? Error: File: runexample3.m Line:4 Column: 6
The expression to the left of the equals sign is not a valid target for an
assignment.
```

Exercise 4: What are the obvious (and not-obvious) errors here?

runexample4:

```
function b=runexample4(a,b);
a=invec;
b=sin(a);
```

```
>> c=runexample4(5);
??? Undefined function or variable 'invec'.

Error in ==> runexample3 at 3
a=invec;
```

Exercise 5: Here's a subtle syntax difficulty. Which of the two versions of `runexample5` on the right gives which of the results on the left? And which version of `runexample5` should you NOT use?

`>> c=runexample5(2,3)`
`c =`
`    10`
	`function [c]=runexample5(a,b)`
	`  c=subfunc(5);`
	`end`
	`function d=subfunc(e)`
	`  d=a*e;`
	`end`

`>> c=runexample(2,3)`
`??? Undefined function or variable 'a'.`
`Error in ==> runexample5>subfunc`
`  d=a*e;`
`Error in ==> runexample5 at 2`
`c=subfunc(5)`
	`function [c]=runexample5(a,b)`
	`c=subfunc(5);`
	`function d=subfunc(e)`
	`  d=a*e;`
	`end`
	`end`