**Exercise 1**: We have a record of speeds for a moving object (say, a drifter). We want to see how long the object moves at a constant speed. In particular, we want to write code which will measure the length of time that the speed is less than maxspd and greater than minspd (this is called a “run”). For example if the speeds are stored in a vector:

spd=[5 1 5 5 5 10 5 1 5 5 5 1 2 2 5] with minspd=4 and maxspd=6,

then we have 3 runs of length 1 and 2 runs of length 3, with no other runs. We would want to store

this information in another variable in which the ith value was the number of runs of length i, i.e.:

runs=[3 0 2 0 0 ...].

Here is some code we have started to write to calculate runs in this way. However, there are 5 small bugs in this code - find and fix them.

function runs=runlength(spd,minspd,maxspd)

% RUNLENGTH calculstes run lengths tatistics

%

% Inputs

%  spd: a time series vector of track speeds

%  minspd and maxspd: the lower and upper limits of speed for a run

%

 % Outputs

% runs: a vector in which runs(i) is the number of runs of i points.

N=length(minspd);

runs=zeros(1,N);

runlen=NaN;

isrun=0;

for i=1:N

if spd(k) >= minspd | spd(k) <= maxspd

isrun=1;

runlen=runlen+1;

else (spd(k)<minspd | spd(k)> maxspd ) && isrun

runs(runlen)=runs(runlen)+1;

runlen=0;

isrun=0;

end

end

if isrun

runs(runlen)=runs(runlen)+1;

end;

**Exercise 2:** Now, to calculate the mean runlength, we have 3 runs of length 1 and 2 of length 3, so the mean is (3\*1 + 2\*3)/(3 + 2). This piece of code is supposed to compute the mean runlength, but it doesn’t work. Fix the 3 small bugs.

sumr=0;

rbar=0;

while k=1:N

rbar = rbar\*k + runs(k);

sumr = sumr + runs(k);

end;

rbar = rbar-sumr;