Final Exam : Largest Sum

CSE 130: Algorithm Design

James is an avid cyclist. He has a power meter on his bicycle which measures how much power he is applying to his pedals. This power meter makes ten measurements a second. When finished, the power meter creates a file with all the power measurements. Since the typical ride is 90 minutes in length, there are about 54,000 individual power measurements in a file. James wants to know what his best 1-minute power was: the highest average power over any 1-minute interval.

Assignment Definition

Write a program to compute the highest average for a given range of values (say 1-minute). The program will:

1. Read the numbers from a file
2. Identify the sub-array with the largest sum
3. Compute the average of that sub-array
4. Display the results

Of course, we want this design to be as efficient as possible… Please do the following:

- Create a representation of a solution to this problem using any combination of design tools presented this semester
- Evaluate the quality of your design using appropriate metrics presented this semester
- Validate the design by applying appropriate quality tools or techniques

Grading

	Exceptional 100%	*Good 90%*	*Acceptable 70%*	*Developing 50%*	*Missing 0%*
Design Quality 60%	The optimal solution was found	A workable solution was found that has acceptable performance characteristics	A correct solution was found with poor performance or a minor flaw exists with the presented solution	Part of the problem was solved but there exists serious issues with the design	The solution as presented is not on track to solve the problem
Tools 10%	The design was unambiguously and clearly described	An appropriate design tool was utilized and the tool was used without error	Minor ambiguity exists in the design presentation or a minor error exists in how the design tool was utilized	The design tool was utilized poorly	The solution does not demonstrate mastery of the design tools of the semester
Metrics 10%	Every nuance of the design was correctly characterized	A suitable metric was utilized and the metric was used without error	A minor error exists in the use of the metric	A serious problem exists in the use of the quality metric	No knowledge of a quality metric was demonstrated
Quality 20%	It is difficult to image how a defect could exist in the code	The design was verified through a suitable application of a quality technique	The design was not adequately verified, but knowledge of quality techniques were demonstrate	Familiarity with quality techniques were demonstrate somewhere in the submitted paper	No knowledge of quality techniques were demonstrated