**I have used ECG value for calculation of heart beat**

**Reasons**:

ECG sensors directly use electrical signals produced by heart activity.

PPG uses electrical signals derived from light reflected due to changes in blood flow during heart activity.

ECG is a reference standard signal that is used for monitoring cardio health and wellness by healthcare providers .

PPG sensors on the other hand typically use ECG signals as a reference for static HR (Heart Rate) comparison.

ECG sensors don’t require long settling times, so meaningful readings can be obtained very shortly after start-up. PPG sensors require a relatively long settling time due to the need for measuring the amount of ambient light and calculating the compensation needed for cancelling its effect.

PPG sensors may also require compensation of motion artifacts to produce a reading.

In contrast, PPG sensors are capable only of measuring HR, and less reliably than with

ECG biosensors. The key challenges with PPG technology are cancelling the effects of ambient light, accommodating different skin conditions and colors, and dealing with physical motion artifacts. Additionally, PPG can only be used on parts of the body that have a high concentration of blood vessels (for example,it can be difficult to get a good PPG signal from the wrist).

**Filling in the missing data samples**

I am storing the last present ecg value from the missing data in variable and replace the missing data with that variable.

**Calculating the heart rate from that signal data**

I have taken a threshold value =0.28 which depends upon the average maximum peak in each curve so that none but only QRS peak is above that threshold.  
Then I have calculated time difference between two consecutive peaks ,this gives me time difference between two beats and calculated number of beats which would occur in one minute based on this time difference.  
I am printing this heart beat rate .

I am using opencsv.jar to parse .csv file .