●不可使用電子計算機

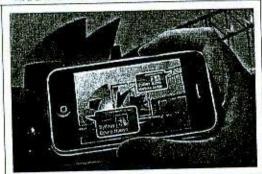1. Explain the following terms: (6%*5=30%)
   (1) register (in CPU)
   (2) pseudo random number
   (3) event driven (in programming)
   (4) XML
   (5) denial of service

2. (10%) What is the difference between bit-mapped graphics and vector graphics? What are the advantages and disadvantages of each?

3. (10%) Please explain the operations of stack and queue and discuss their differences.

4. (10%) Class inheritance is a very important property in object-oriented programming. Please explain what class inheritance is and discuss its advantages.

5. (20%) Mean and variance are very important quantities for describing a set of data. Please write a program (in pseudo code) to compute the mean and variance of a set of data (Suppose the data is stored in an array **X** and N represents the length of the array).

   (Hint: mean $m_X = \dfrac{1}{N}\sum_{i=1}^{N} X_i$, variance $v_X = \dfrac{1}{N-1}\sum_{i=1}^{N}(X_i - m_X)^2$)

6. (10%) 欲開發以下應用服務，需使用哪些軟體技術與硬體技術？

7.　(10%) 請翻譯下段文字為中文：

　　Kinect is based on software technology which interprets 3D scene information from a continuously-projected infrared structured light. The Kinect sensor is a horizontal bar connected to a small base with a motorized pivot. The device features an "RGB camera, depth sensor and multi-array microphone running proprietary software", which provide full-body 3D motion capture, facial recognition and voice recognition capabilities. The sensor's microphone array enables the Xbox 360 to conduct acoustic source localization and ambient noise suppression, allowing for things such as headset-free party chat.

　　The depth sensor consists of an infrared laser projector combined with a monochrome CMOS sensor. The sensing range of the depth sensor is adjustable, with the Kinect software capable of automatically calibrating the sensor based on gameplay and the player's physical environment, such as the presence of furniture.

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