Practice Final Exam
Topic: Android programming, Android OS, and General mobile systems programming.
Duration: 1 hour
Total Points: 20 (adds to finals as extra-credits)

Name

PID

1. **SQL**: Write an Android code snippet that reads the PRODUCT table from a SQLite database and prints only the NAME and PRICE of any two products.

   Table: PRODUCT
<table>
<thead>
<tr>
<th>ID</th>
<th>NAME</th>
<th>COMPANY</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nexus</td>
<td>LG</td>
<td>550</td>
</tr>
<tr>
<td>2</td>
<td>BLU</td>
<td>BLU</td>
<td>100</td>
</tr>
<tr>
<td>3</td>
<td>iPhone</td>
<td>Apple</td>
<td>999</td>
</tr>
<tr>
<td>4</td>
<td>Pixel</td>
<td>Google</td>
<td>800</td>
</tr>
<tr>
<td>5</td>
<td>Galaxy</td>
<td>Samsung</td>
<td>850</td>
</tr>
</tbody>
</table>

2. **ADB**: Write an Android code snippet that can tell if a specific package “com.unc.mypack” is installed in your phone or not.
3. In a next generation very low-power mobile system, the energy consumption for every single instruction needs to be carefully considered. The way the system is designed, the total energy consumption of each function cannot be more than 100 joules. Given this constraint, how would you split the following function big() into two or more smaller functions small_1(), small_2(), small_3(), etc. so that when the small functions are run in a sequence, we have the same task done as executing the big() one, but each of the small_i() methods take less than 100 Joules of energy?

<table>
<thead>
<tr>
<th>The function you need to split</th>
<th>Energy cost for each statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>int big (int arr[]) {</td>
<td></td>
</tr>
<tr>
<td>int i;</td>
<td>5 joules</td>
</tr>
<tr>
<td>int k = 1;</td>
<td>5 joules</td>
</tr>
<tr>
<td>for (i = 0; i &lt; 3; i++) {</td>
<td>10 joules</td>
</tr>
<tr>
<td>k = k * arr[i];</td>
<td>60 joules</td>
</tr>
<tr>
<td>}</td>
<td>10 joules</td>
</tr>
<tr>
<td>return k;</td>
<td></td>
</tr>
<tr>
<td>}</td>
<td></td>
</tr>
</tbody>
</table>

3(a): Split the big() function:

```c
int small_1() {
}

int small_2() {
}

int small_3() {
}
```

3(b) In a scale 1-to-10 (where 1 is easiest, and 10 is most difficult), how easy do you find it to split the big() function?

3(c) In a scale 1-to-10, (where 1 is easiest, and 10 is most difficult), how easy do you find it to come up with an idea about how to split the big() function?

3(d) In a scale 1-to-10 (where 1 is easiest, and 10 is most difficult), how easy do you find it to calculate the total energy consumption of the big() function?

3(e) How much time did you spend to split the big() function (in minutes)?