CPSC 213
Answers to Part II of Midterm Practice Questions

Part II

Question 1

ld $0x3000, r0  # r0 = address of b
ld 0x0(r0), r0  # r0 = address of array b
ld 0x8(r0), r1  # r1 = *(b+2)
ld $0x1000, r2  # r2 = address of i
ld 0x0(r2), r2  # r2 = i
ld $0x2000, r3  # r3 = address of a
st r1, (4*r2, r3)  # a[i] = r1

Question 2

We assume:
- i is stored at location 1000
- r5 points to the location for j and k is in the next word after k
  That is, we assume that foo stoted r6 on the stack before calls bar(), and
  removed it after bar returned.

ld $0x0 r0       # r0 = 0
ld $0x1000, r1  # r1 = address of i
st r0, 0x0(r1)  # i = 0
st r0, 0x0(r5)  # j = 0
st r0, 0x4(r5)  # k = 0
Question 3

We assume:
- $i$ is stored at location 1000
- foo does not need to store r6 on the stack, as it does not call any other function

```
ld   $0x0  r0          # r0 = 0
ld   $0x1000, r1      # r1 = address of i
st   r0, 0x0(r1)      # i = 0
st   r0, 0x8(r5)      # m = 0, m is stored just below k
st   r0, 0x0(r5)      # j = 0
st   r0, 0x4(r5)      # k = 0
```

Question 4

The following diagram shows the final values:

```
| 5 |
---|---|
```

```
| 25 |
```
**Question 5**

The C code that correspond to the given assembly code is:

```c
int sum (int* a, int aLength) {
    int i;
    int s;
    s = 0;
    for (i=0; i<aLength; i++)
        s += a[i];
    return s;
}
```

**Question 6**

typedef struct {
    int noSides;       //number of sides
    float * side;      // a dynamic array with the length of each side
} Polygon;

Polygon* createPolygon( int n ) {
    Polygon* p = (Polygon *) malloc( sizeof(Polygon));
    p->noSides = n;
    p->side = (float *) malloc( n * sizeof(float));
    return p;
}

setSide(Polygon* pg, int s, float length) {
    if ( 0 <= s && s < pg->noSides )
        pg->side[s] = length;
}

...