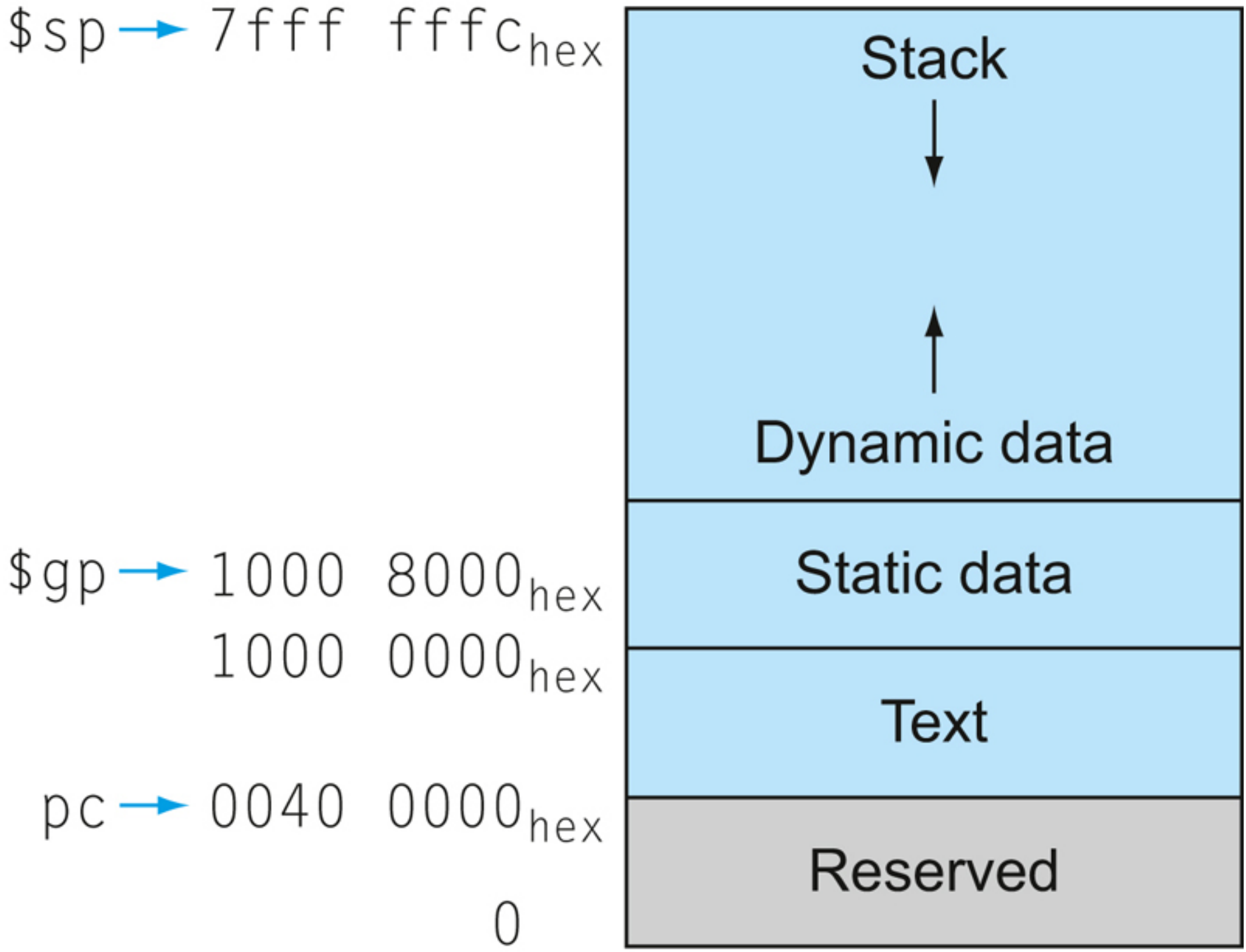

FIGURE 2.13 The MIPS memory allocation for program and data. These addresses are only a software convention, and not part of the MIPS architecture. The stack pointer is initialized to 7fff $fffc_{hex}$ and grows down toward the data segment. At the other end, the program code ("text") starts at 0040 0000_{hex}. The static data starts at 1000 $0000_{hex.}$ Dynamic data, allocated by malloc in C and by new in Java, is next. It grows up toward the stack in an area called the heap. The global pointer, $gp, is set to an address to make it easy to access data. It is initialized to 1000 8000_{hex} so that it can access from 1000 0000_{hex} to 1000 $ffff_{hex}$ using the positive and negative 16-bit offsets from $gp. This information is also found in Column 4 of the MIPS Reference Data Card at the front of this book.