

January 2010 - d

SORTES: Software for embedded and real-time systems

- 1) Reimplement yourself the following functions:

`size_t strcpy(char *dst, const char *src, size_t dstsize);`

The `strcpy()` function copies at most `dstsize-1` characters (`dstsize` being the size of the string buffer `dst`) from `src` to `dst`, truncating `src` if necessary. The result is always null-terminated. The function returns `strlen(src)`.

`char *strtok_r(char *s1, const char *s2, char **lasts);`

The `strtok_r()` function considers the null-terminated string `s1` as a sequence of zero or more text tokens separated by spans of one or more characters from the separator string `s2`. The argument `lasts` points to a user-provided pointer which points to stored information necessary for `strtok_r()` to continue scanning the same string.

In the first call to `strtok_r()`, `s1` points to a null-terminated string, `s2` to a null-terminated string of separator characters, and the value pointed to by `lasts` is ignored. The `strtok_r()` function returns a pointer to the first character of the first token, writes a null character into `s1` immediately following the returned token, and updates the pointer to which `lasts` points.

In subsequent calls, `s1` is a null pointer and `lasts` is unchanged from the previous call so that subsequent calls move through the string `s1`, returning successive tokens until no tokens remain. The separator string `s2` can be different from call to call. When no token remains in `s1`, a null pointer is returned.

- 2) Represent in ASG the behaviour of a polling station, including one desk to verify the identity of the voters, four voting booths and a ballot box.
- 3) If you implement an ASG diagram with techniques similar to the Microchip TCP-IP stack, how would you implement
- entering in a state in one of the parallel components that is itself divided in parallel components.
 - 2 transitions of priorities 1 and 2, leaving a state to 2 other states
- Explain of course.
- 4) If you have a scheduling system such as that of the Microchip TCPIP stack, (a) what should you put in a task and what should you put in an interrupt service routine; (b) what will you do if you are warned by an interrupt of an external event that should be handled by a task.

duration: 3 hours, with open books and notes.