

## SDL\_bgi and Emscripten

Unmodified SDL\_bgi programs can be compiled to WebAssembly using the [Emscripten](#) compiler `emcc`; please see `INSTALL_Emscripten.md`.

When Emscripten support is installed, the following tools are used to make standalone html files that can be run in browsers without the need of a local webserver:

- `demo/emcc.sh` can be used to compile a program;
- `demo/Makefile.emcc` compiles the sample programs.

The `emcc` flag `-s ASYNCIFY` is used to simulate infinite loops without modifying the program sources, at the expense of some performance hit.

## Compiling Programs

Compilation example:

```
demo$ ./emcc.sh life.c
demo$ firefox ./life.html &
```

The script `emcc.sh` uses one of the available shells in directory `demo/shells`, and embeds files that exist in `demo/assets`. Type `./emcc.sh -h` for a brief explanation.

To compile nearly all available demo programs:

```
demo$ make -f Makefile.emcc
```

Not all programs can be compiled, though. For example, `loadimage.c` makes no sense when run in a browser; in fact, it expects to find files in the local file system, which is not accessible by the browser.

To compile a program directly in the command line:

```
demo$ emcc --emrun -o program.html program.c -lSDL_bgi \
    -std=gnu99 -O2 -Wall -lm \
    -s USE_SDL=2 -s ALLOW_MEMORY_GROWTH=1 -s ASYNCIFY -s SINGLE_FILE
```

The `-s SINGLE_FILE` flag can be omitted if you are running a local web server.

## Available shells

Emscripten shell files are html templates that define how a program will look when run in the browser. Four shells are provided:

`sdl_bgi.html`: canvas + text area, no logo

`shell_minimal.html`: taken from [Emscripten sources](#)

`canvas_only.html`: canvas only, no text area, no logo

`fullwindow.html`: canvas only, full window, resizable, no border. This shell is quite slow.

If no shell is specified, the default Emscripten shell will be used.

## Environment Files

Environment variables don't exist in a browser environment. However, the same result as using variables can be obtained writing "environment files" in the `assets/` directory. The file `SDL_BGI_RES`, containing the string `VGA`, will have the same effect as the environment variable `SDL_BGI_RES`. The same holds for `SDL_BGI_PALETTE`, value `BGI`. Files must exist at compile time.

## Caveats

SDL2 mutex support is not available in current releases of Emscripten. Hence, all references to mutex-related functions in `SDL_bgi.c` are excluded from compilation. For example:

```
#ifndef __EMSCRIPTEN__
static SDL_mutex
    *bgi_update_mutex = NULL;
#endif
```

As a result, automatic refresh is not available.

Programs running in fullscreen mode need keyboard input to toggle fullscreen mode in the browser.