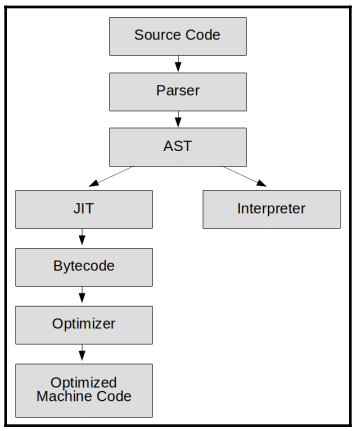
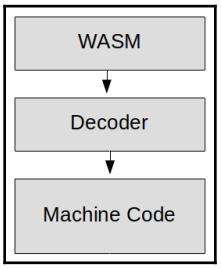
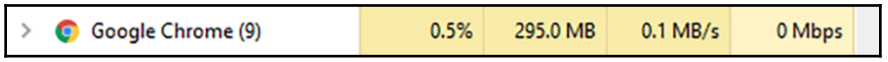
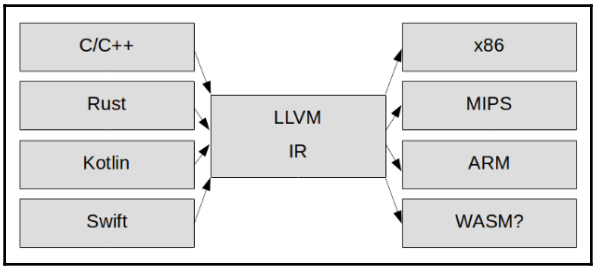
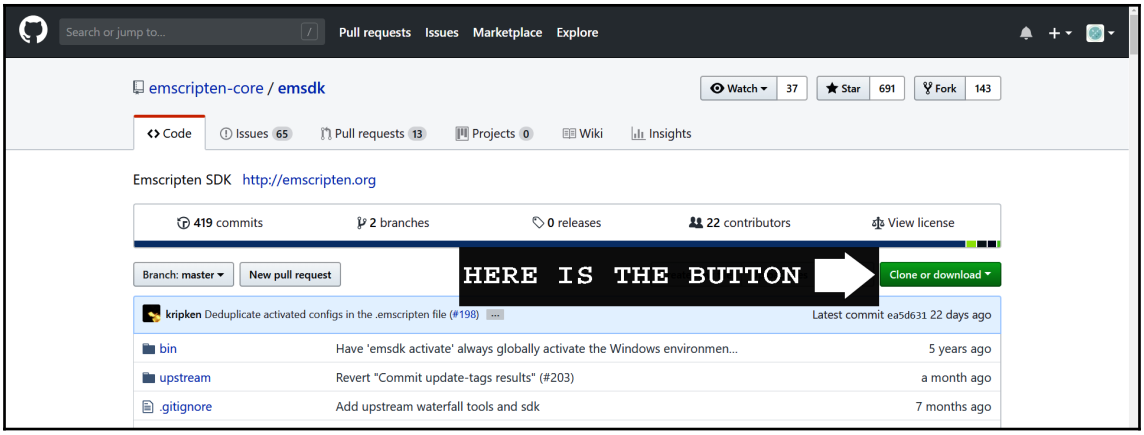
Chapter 1: Introduction to WebAssembly and Emscripten







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419 commits
2 branches
0 releases
22 contributors
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Branch: master
New pull request
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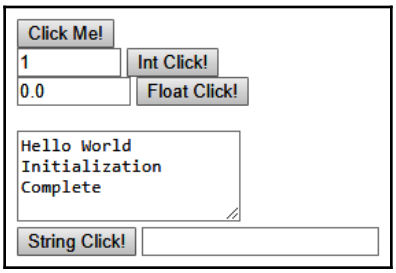
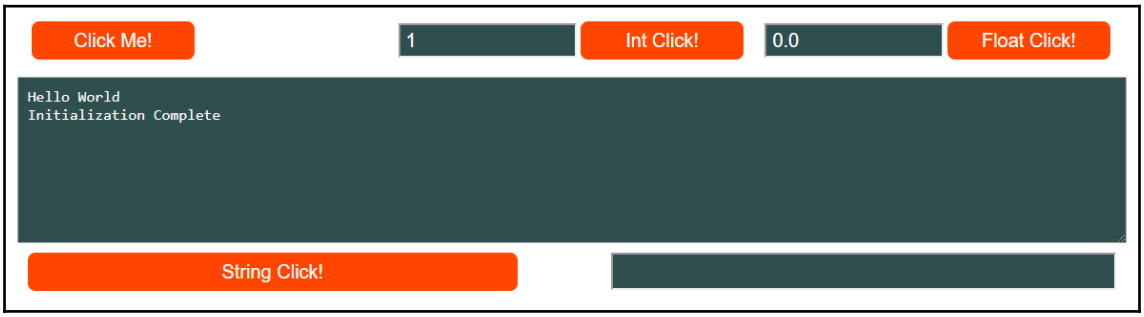
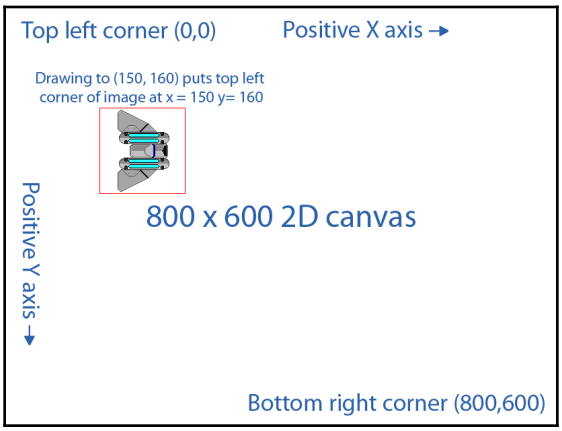
kripken Deduplicate activated configs in the .emscripten file (#198)
Latest commit ea5d631 22 days ago
bin
Have 'emsdk activate' always globally activate the Windows environmen...
5 years ago
upstream
Revert "Commit update-tags results" (#203)
a month ago
.gitignore
Add upstream waterfall tools and sdk
7 months ago

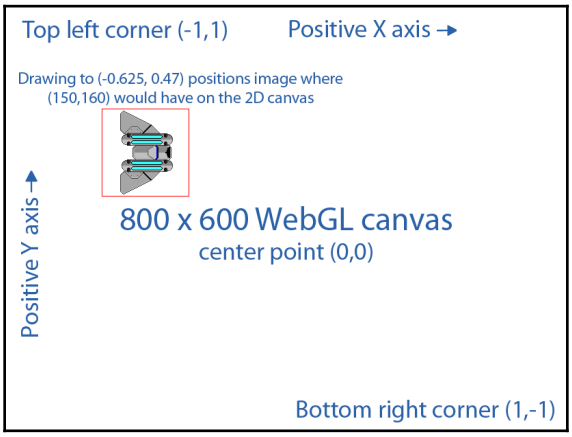
Chapter 2: HTML5 and WebAssembly

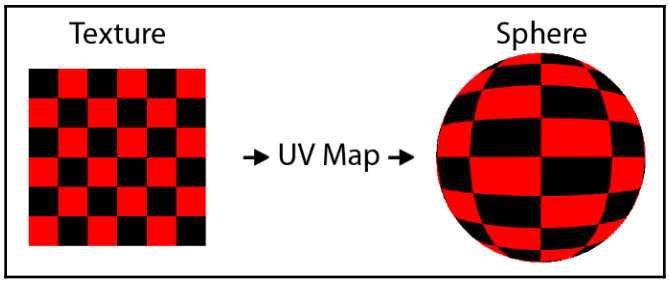


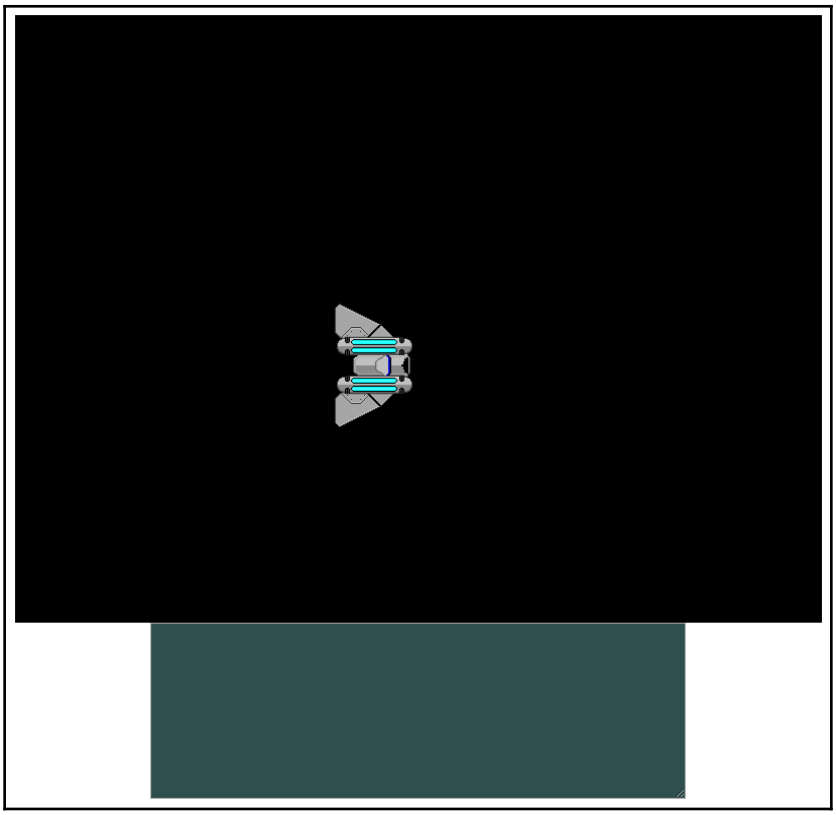


Chapter 3: Introduction to WebGL

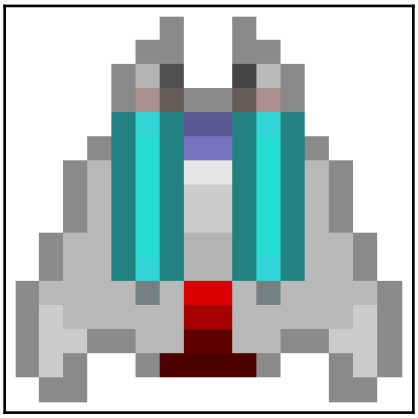


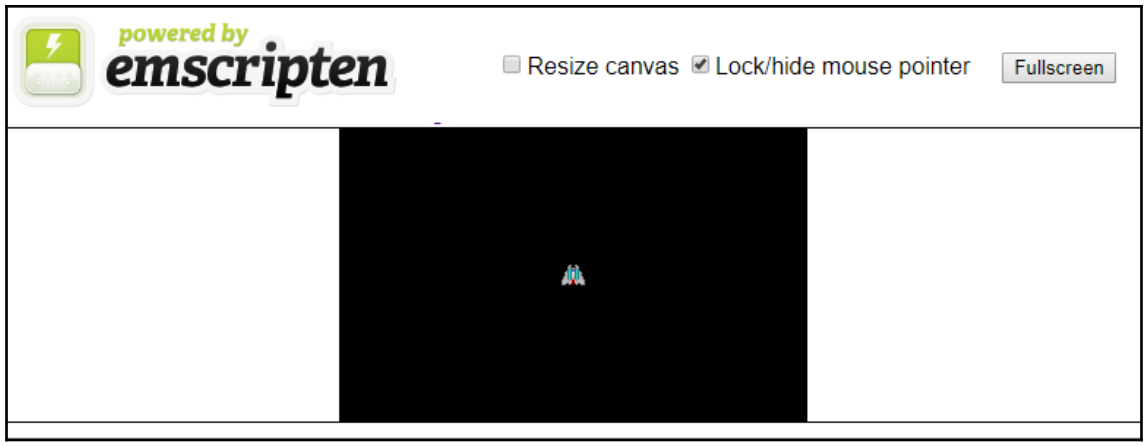






Chapter 4: Sprite Animations in WebAssembly with SDL




powered by
emscripten
Resize canvas
Lock/hide mouse pointer
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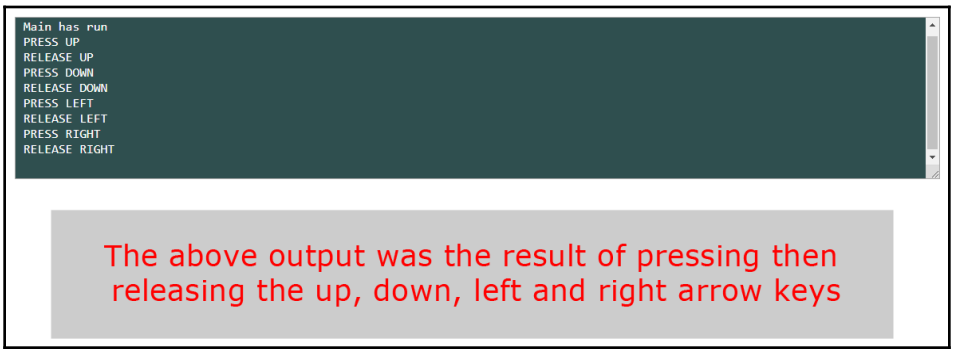
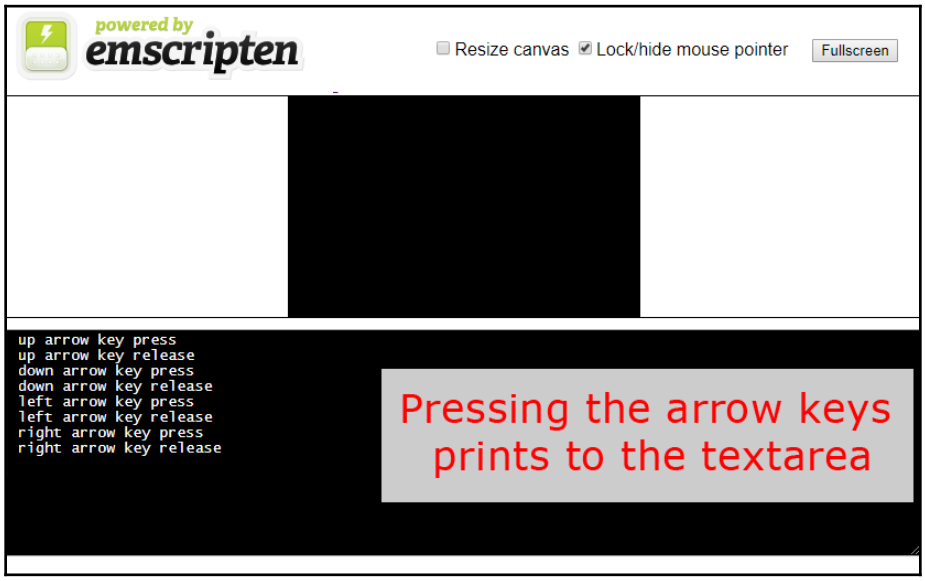
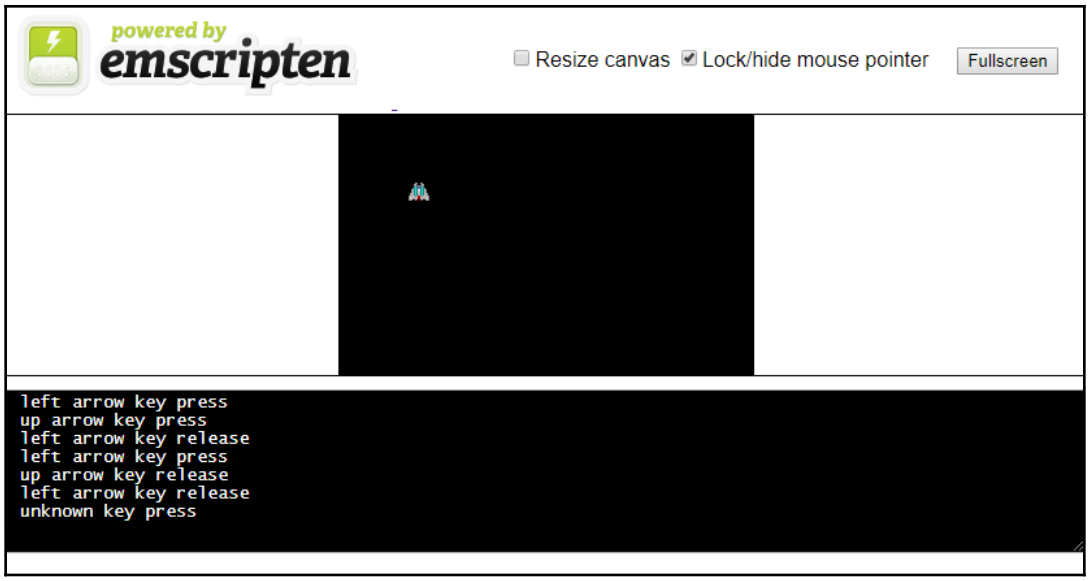
Chapter 5: Keyboard Input



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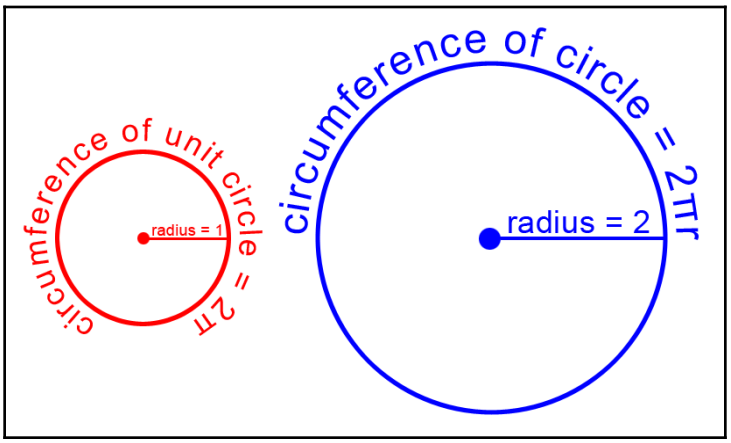
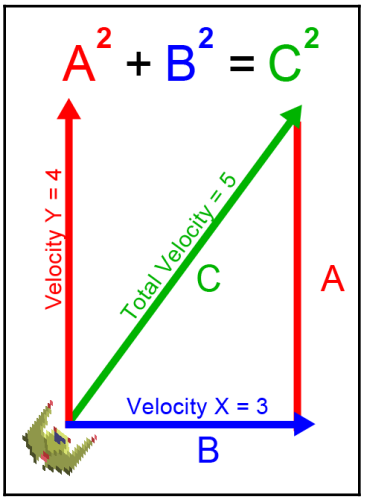
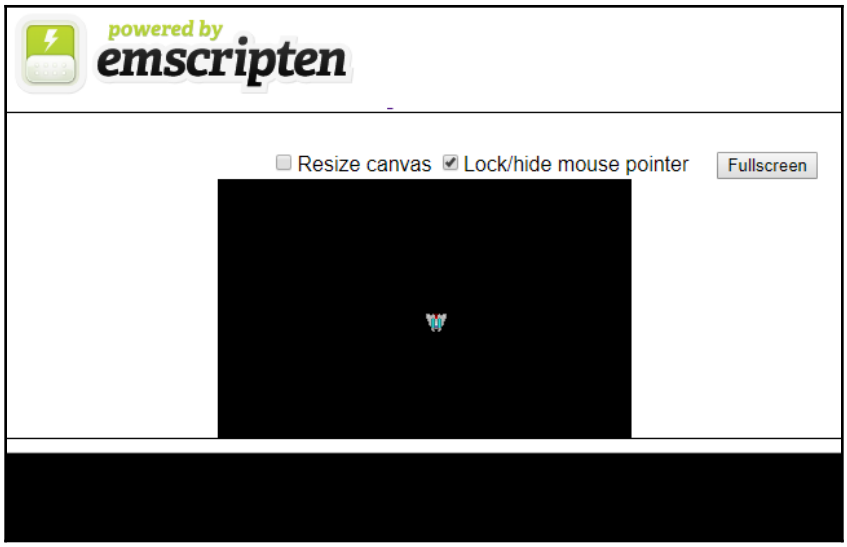
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
left arrow key press
up arrow key press
left arrow key release
left arrow key press
up arrow key release
left arrow key release
unknown key press

Chapter 6: Game Objects and the Game Loop



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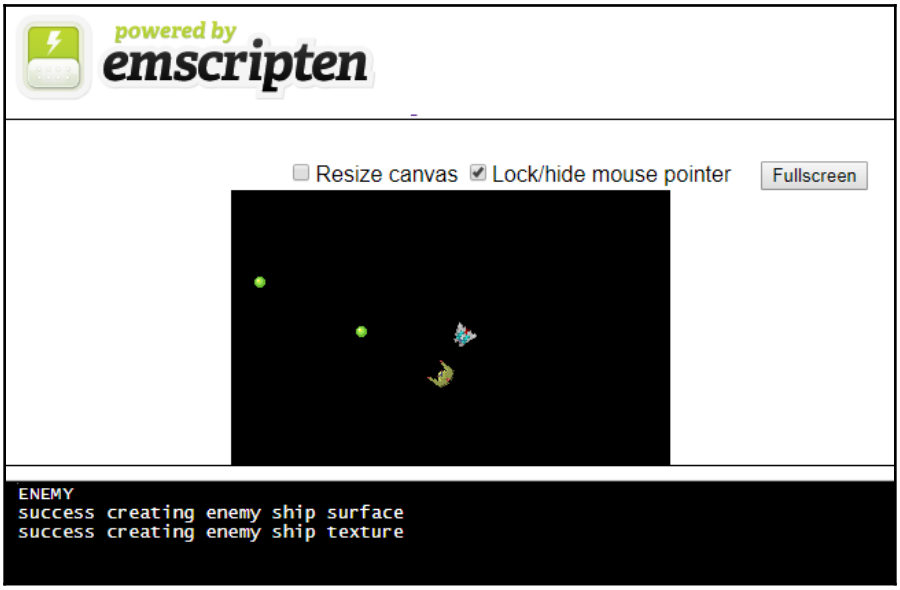
Fullscreen


powered by
emscripten
Resize canvas
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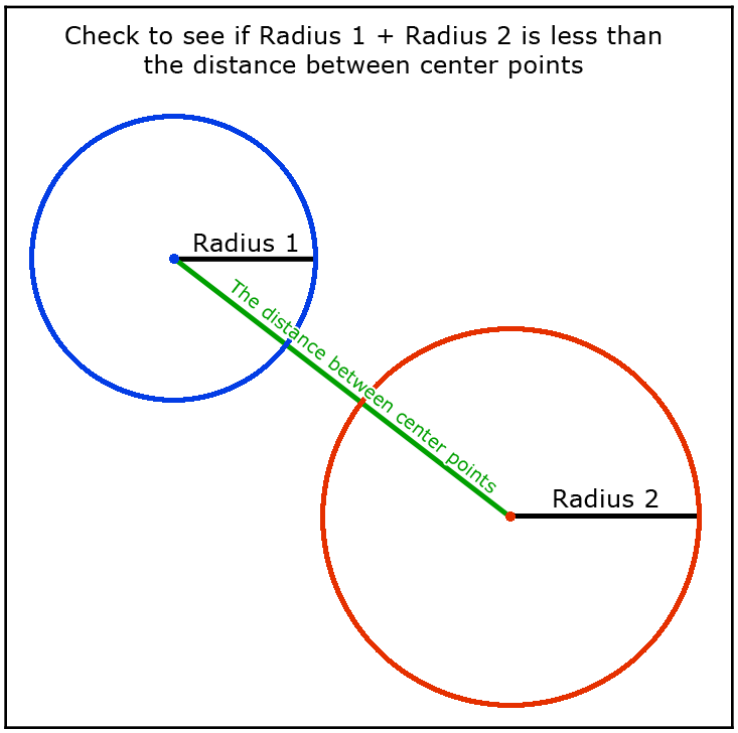
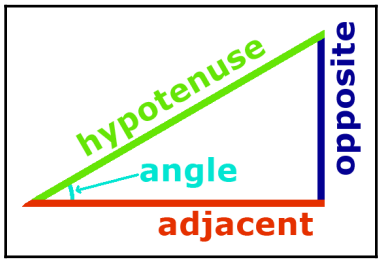
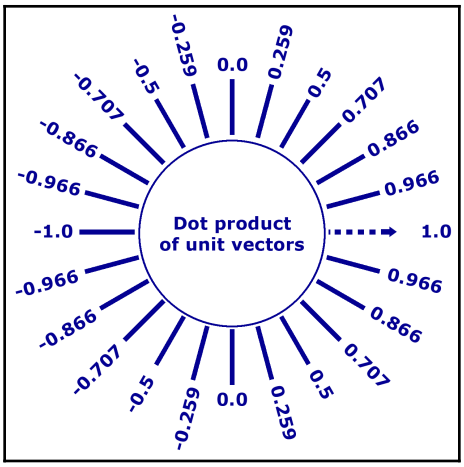
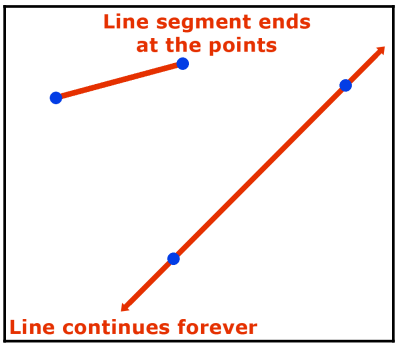
Fullscreen
ENEMY
success creating enemy ship surface
success creating enemy ship texture

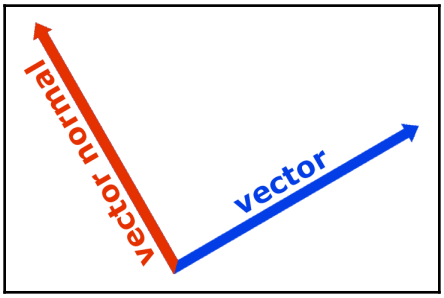
Chapter 7: Collision Detection

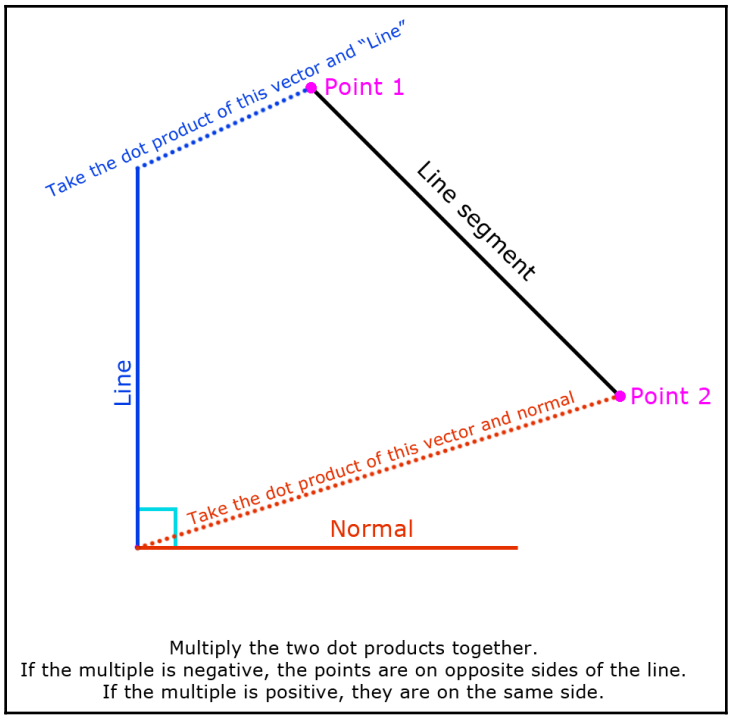




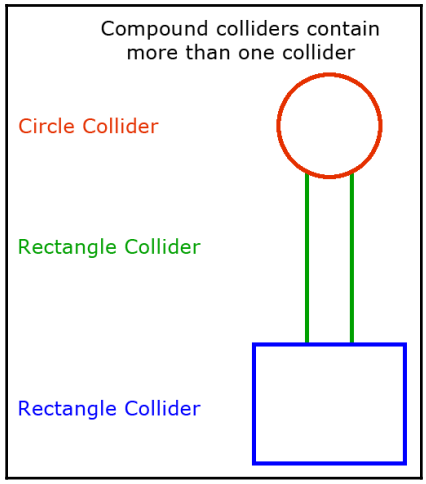

Dot product
of unit vectors
1.0
0.966
0.866
0.707
0.5
0.259
0.0
-0.259
-0.5
-0.707
-0.866
-0.966
-1.0

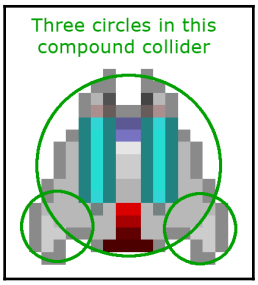

Line segment ends
at the points
Line continues forever

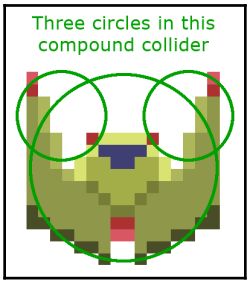

vector normal
vector

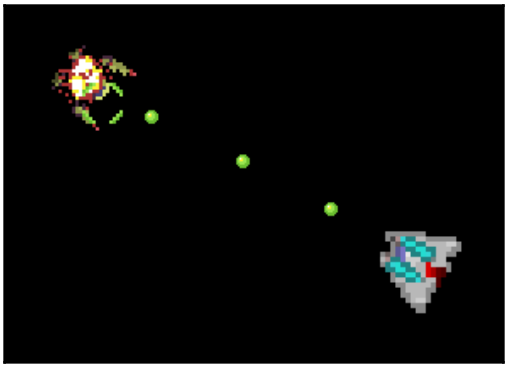


Multiply the two dot products together.
If the multiple is negative, the points are on opposite sides of the line.
If the multiple is positive, they are on the same side.

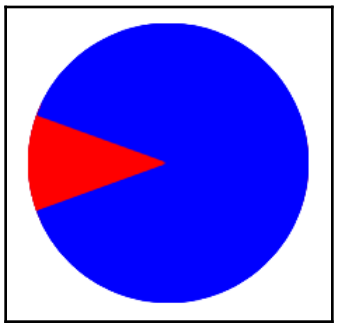


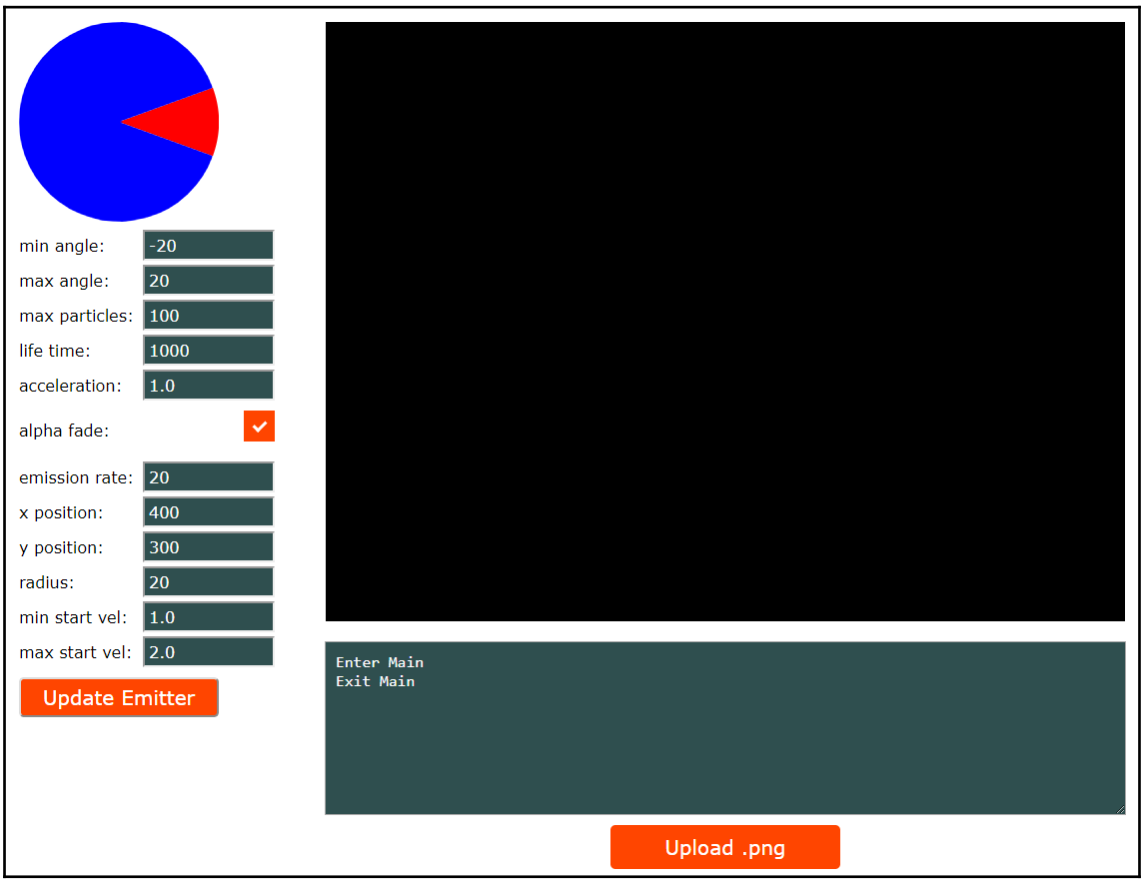

Three circles in this
compound collider


Three circles in this
compound collider

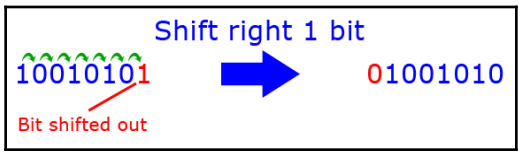


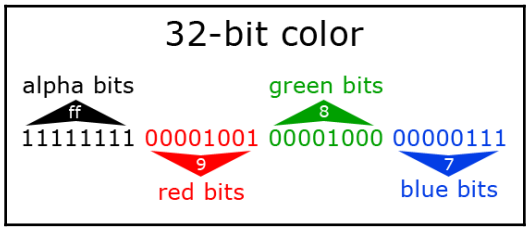
Chapter 8: Basic Particle System

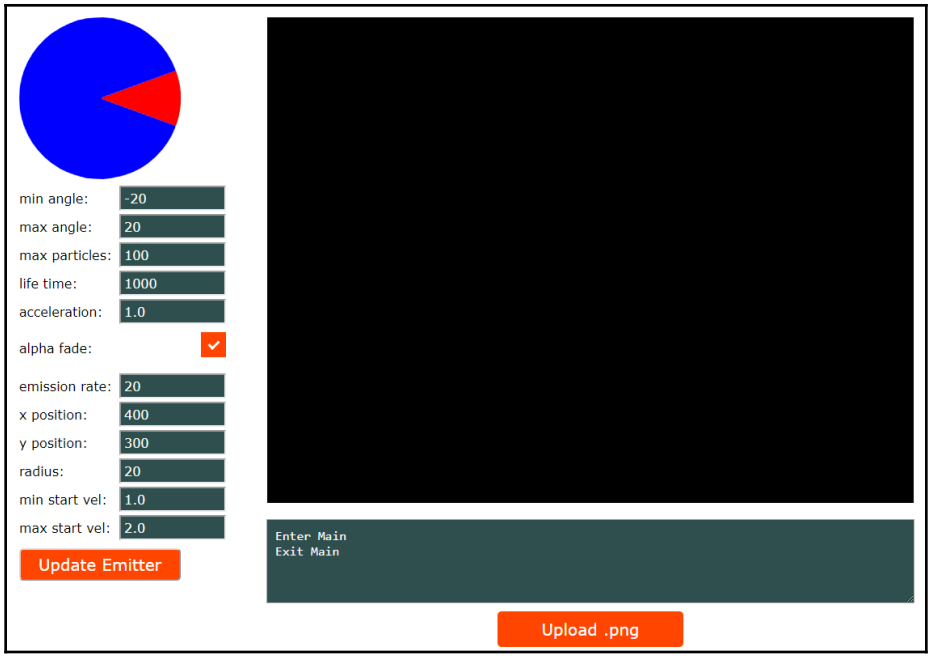


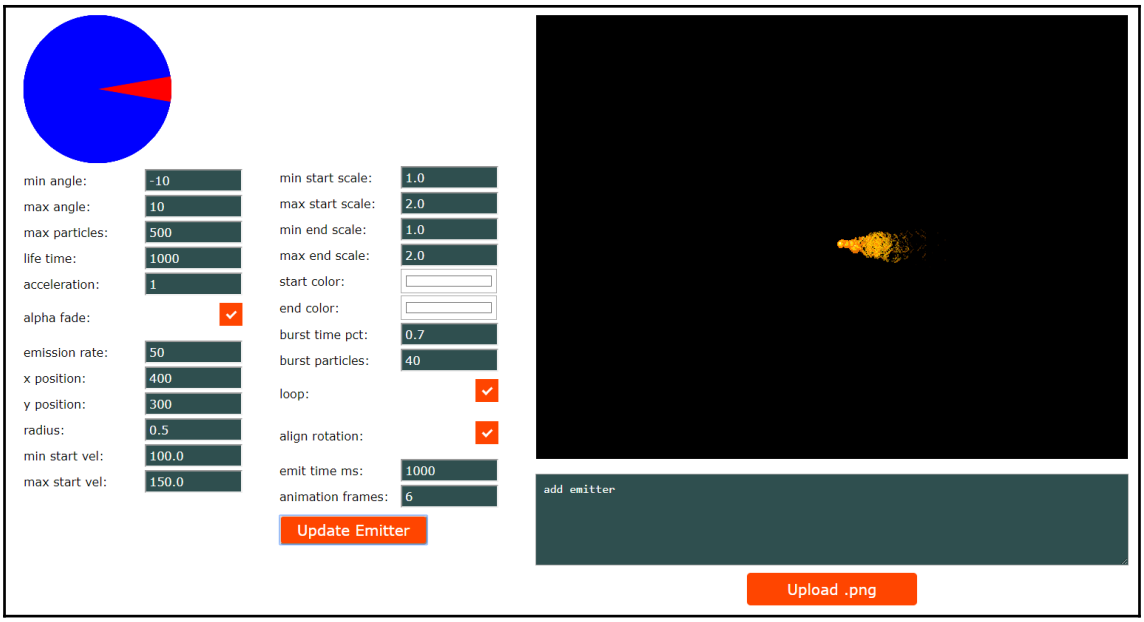


Chapter 9: Improved Particle Systems





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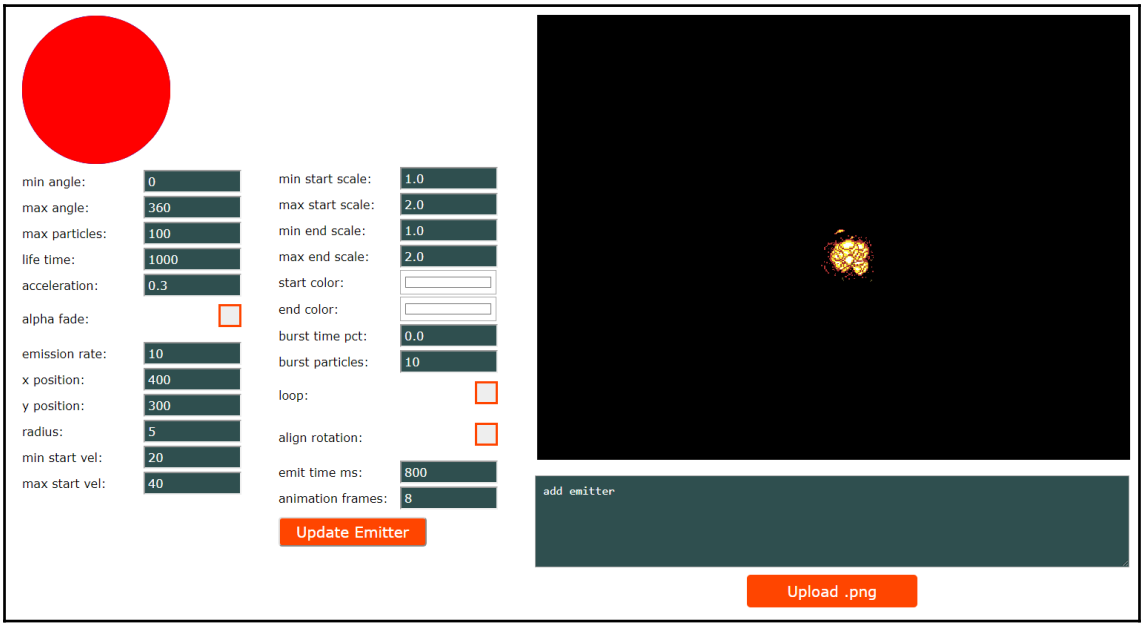
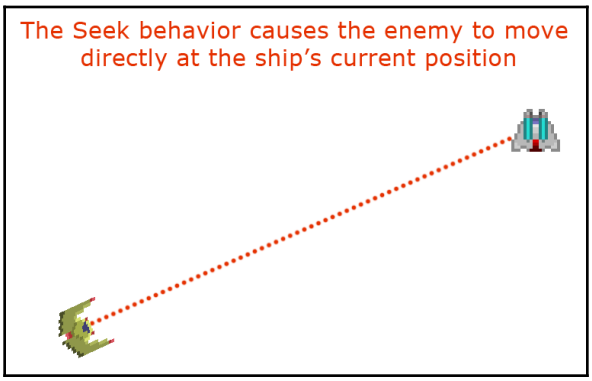
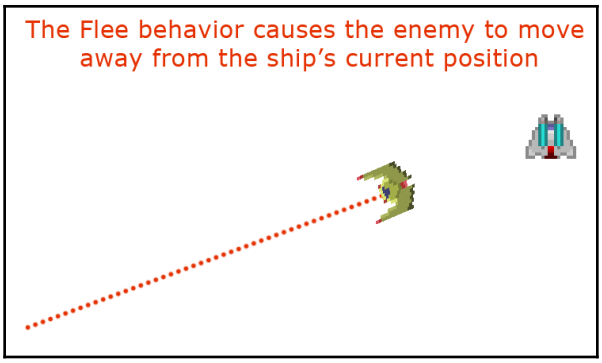
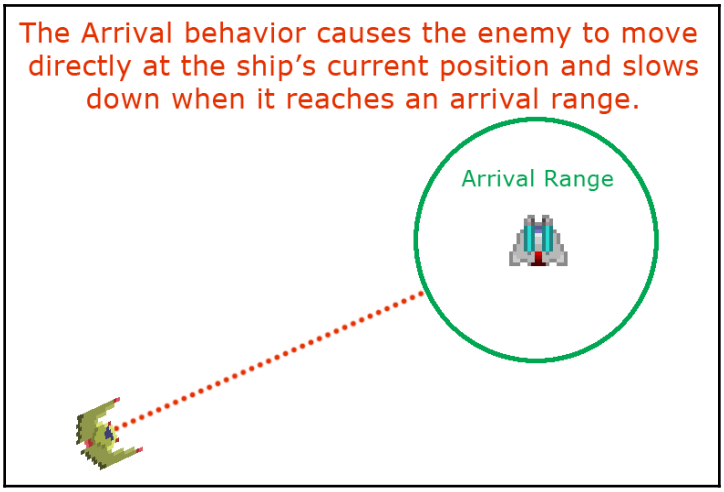
max angle: 10
max particles: 500
life time: 1000
acceleration: 1
alpha fade:
emission rate: 50
x position: 400
y position: 300
radius: 0.5
min start vel: 100.0
max start vel: 150.0
min start scale: 1.0
max start scale: 2.0
min end scale: 1.0
max end scale: 2.0
start color:
end color:
burst time pct: 0.7
burst particles: 40
loop:
align rotation:
emit time ms: 1000
animation frames: 6
Update Emitter
add emitter
Upload .png

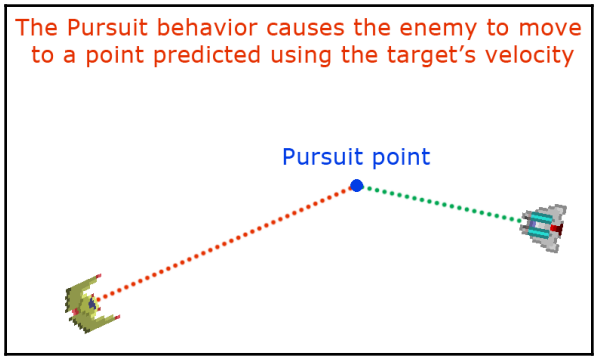

min angle: 0
max angle: 360
max particles: 100
life time: 1000
acceleration: 0.3
alpha fade:
emission rate: 10
x position: 400
y position: 300
radius: 5
min start vel: 20
max start vel: 40
min start scale: 1.0
max start scale: 2.0
min end scale: 1.0
max end scale: 2.0
start color:
end color:
burst time pct: 0.0
burst particles: 10
loop:
align rotation:
emit time ms: 800
animation frames: 8
Update Emitter
add emitter
Upload .png

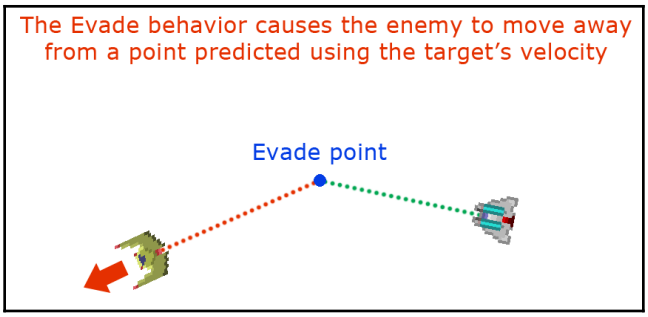
Chapter 10: AI and Steering Behaviors

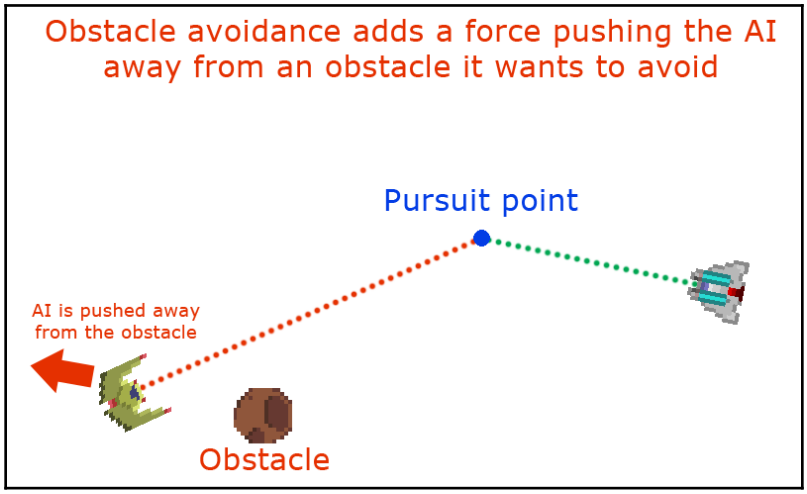


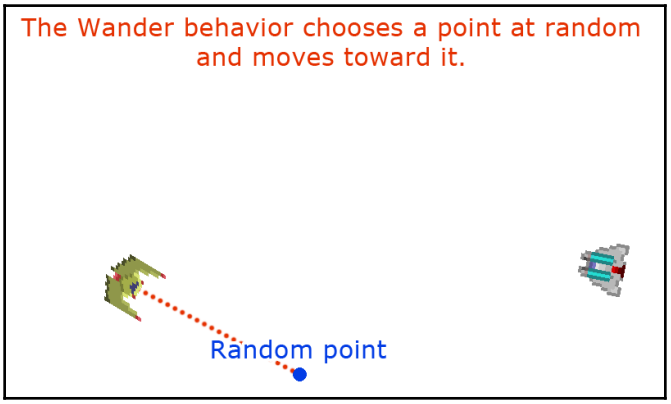

The Flee behavior causes the enemy to move away from the ship's current position

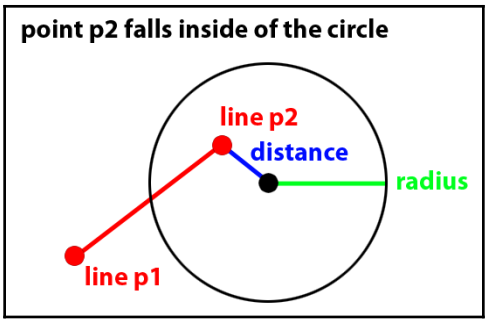

The Arrival behavior causes the enemy to move directly at the ship's current position and slows down when it reaches an arrival range.
Arrival Range

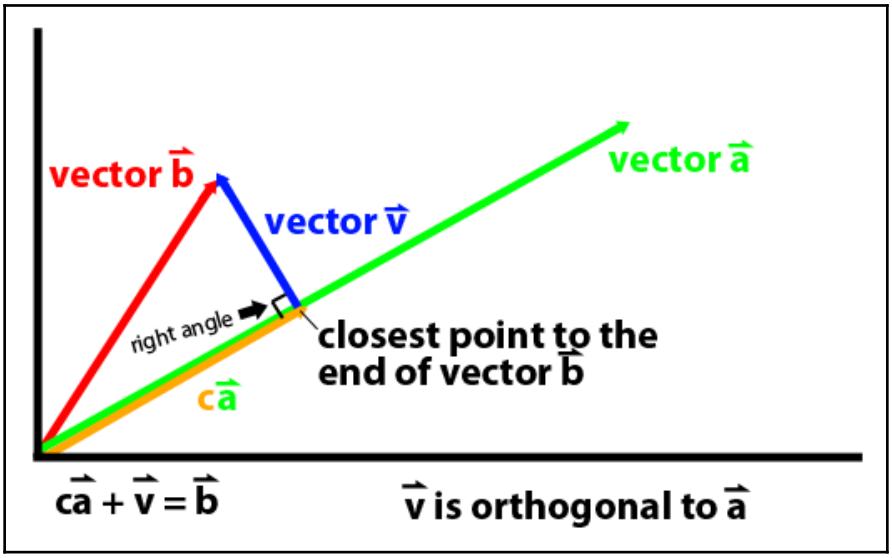

The Pursuit behavior causes the enemy to move to a point predicted using the target's velocity
Pursuit point

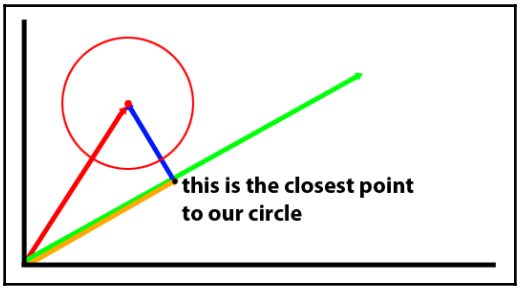

The Evade behavior causes the enemy to move away from a point predicted using the target's velocity
Evade point

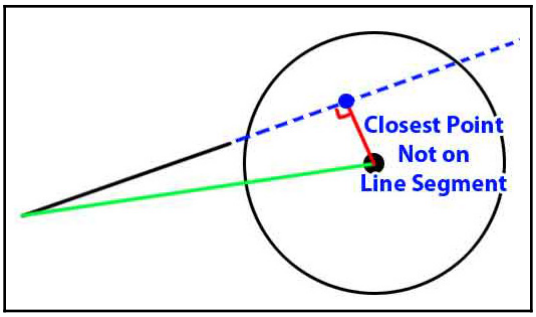

Obstacle avoidance adds a force pushing the AI away from an obstacle it wants to avoid
Pursuit point
AI is pushed away from the obstacle
Obstacle

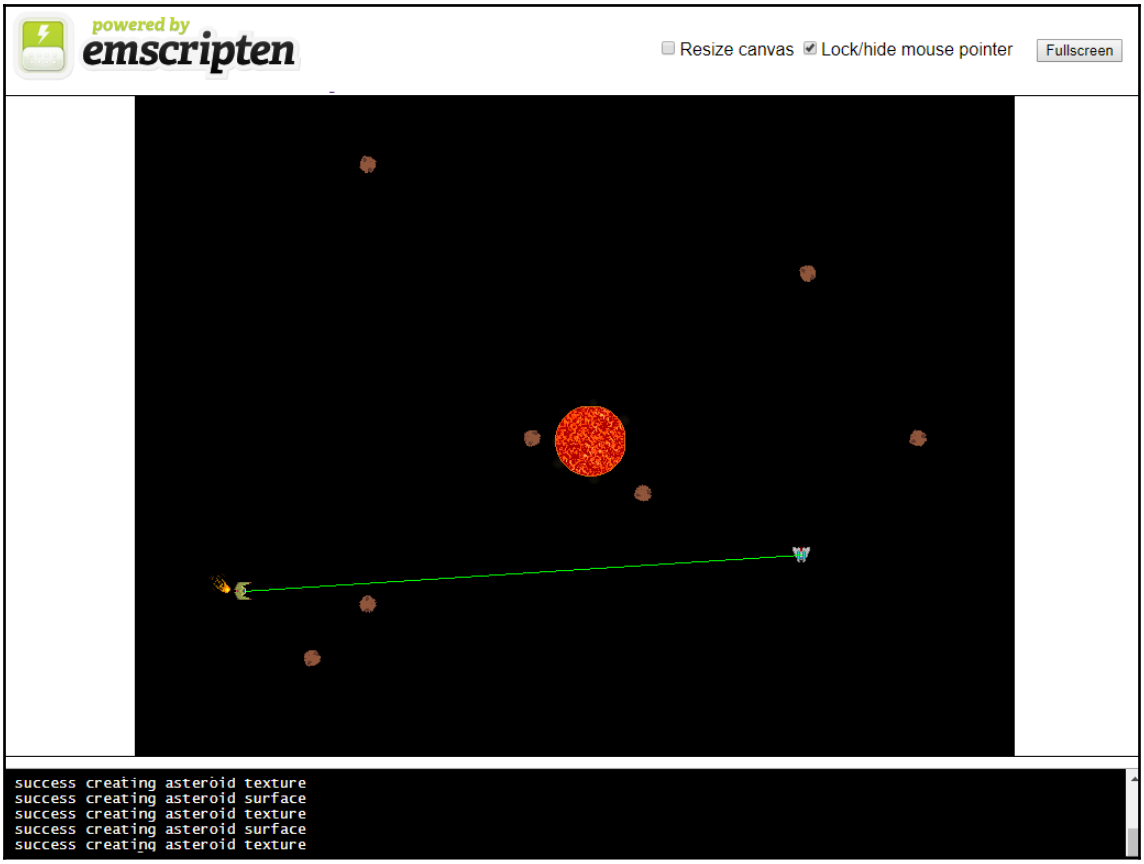

The Wander behavior chooses a point at random and moves toward it.
Random point


point p2 falls inside of the circle
line p2
distance
radius
line p1

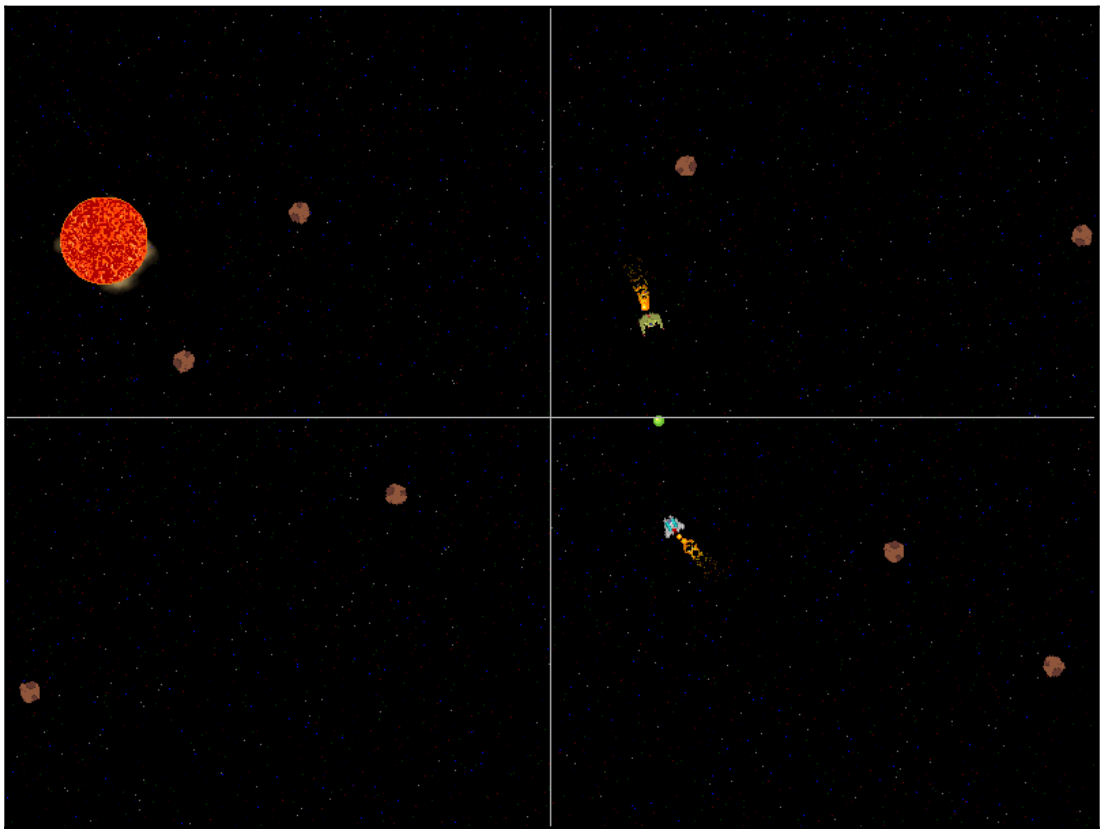

vector b
vector v
vector a
right angle
closest point to the
end of vector b
ca
ca + v = b
v is orthogonal to a


this is the closest point
to our circle

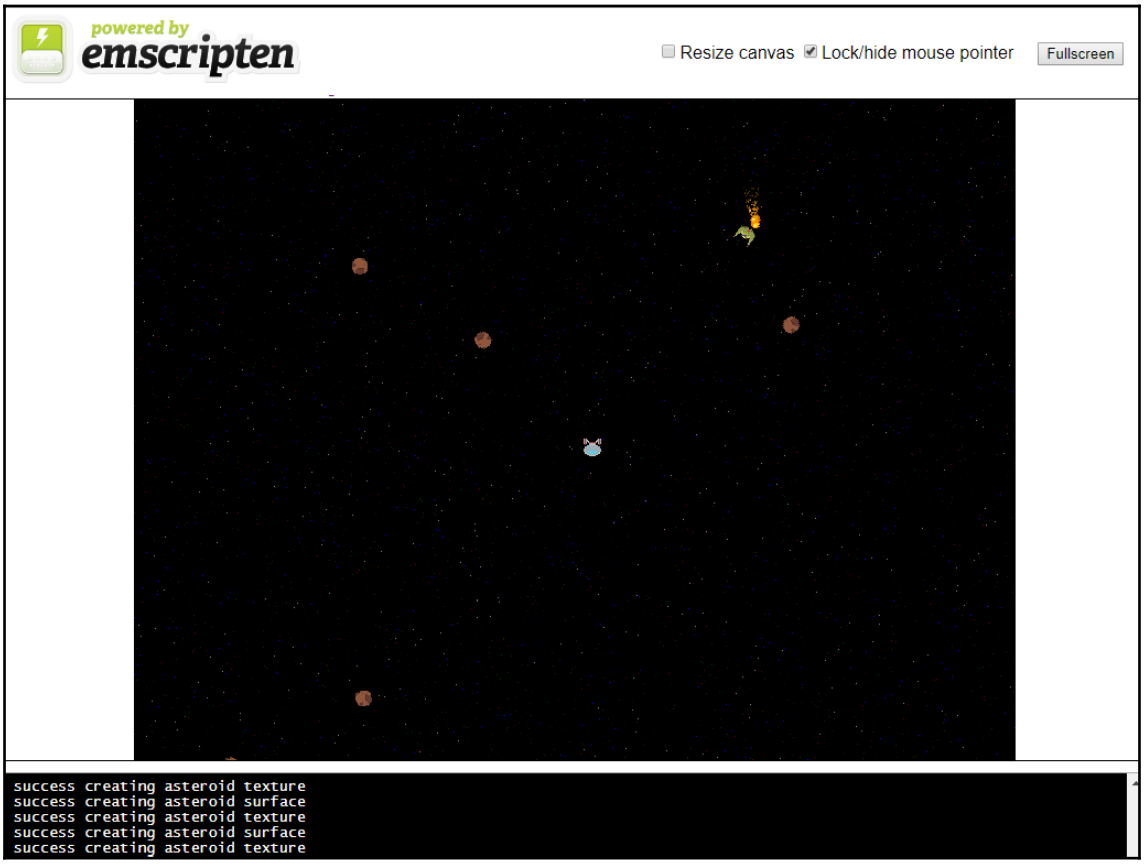

Closest Point
Not on
Line Segment


powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
success creating asteroid texture
success creating asteroid surface
success creating asteroid texture
success creating asteroid surface
success creating asteroid texture

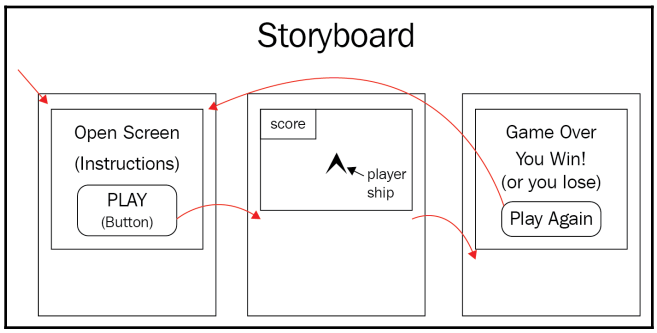
Chapter 11: Designing a 2D Camera



Chapter 13: Game Physics

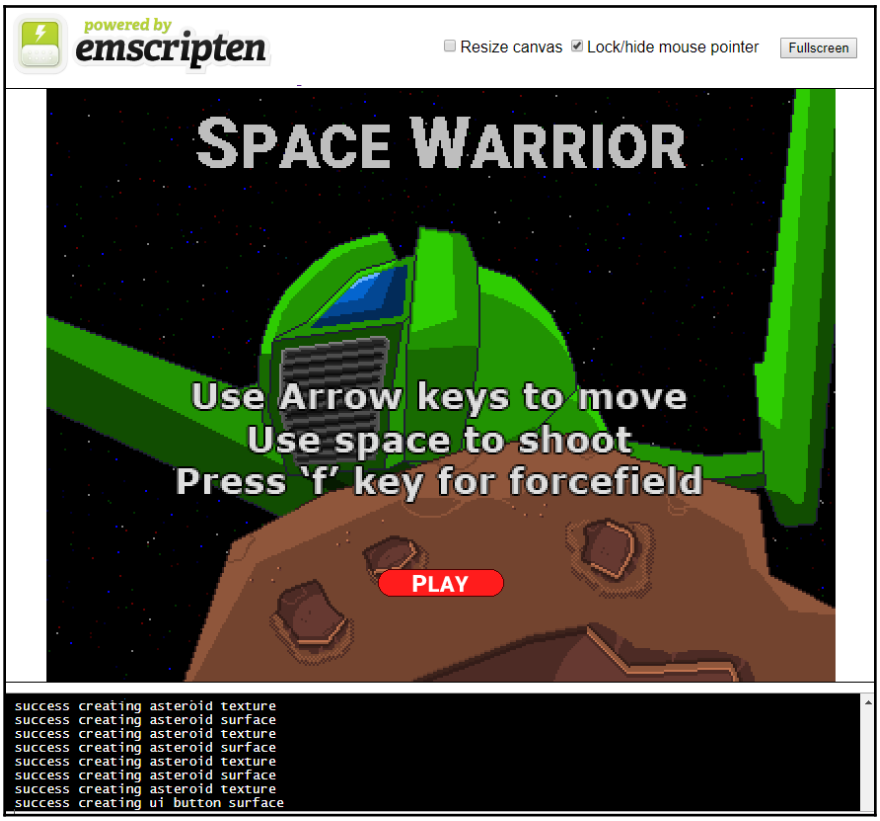


Chapter 14: UI and Mouse Input

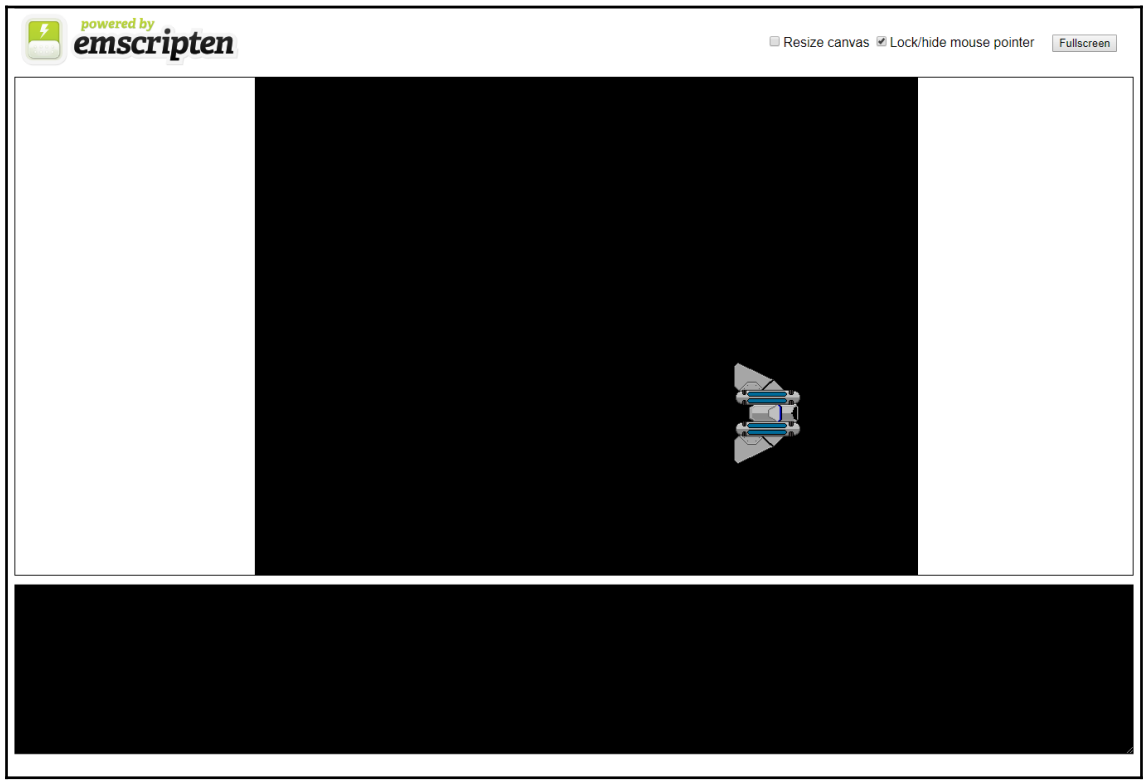


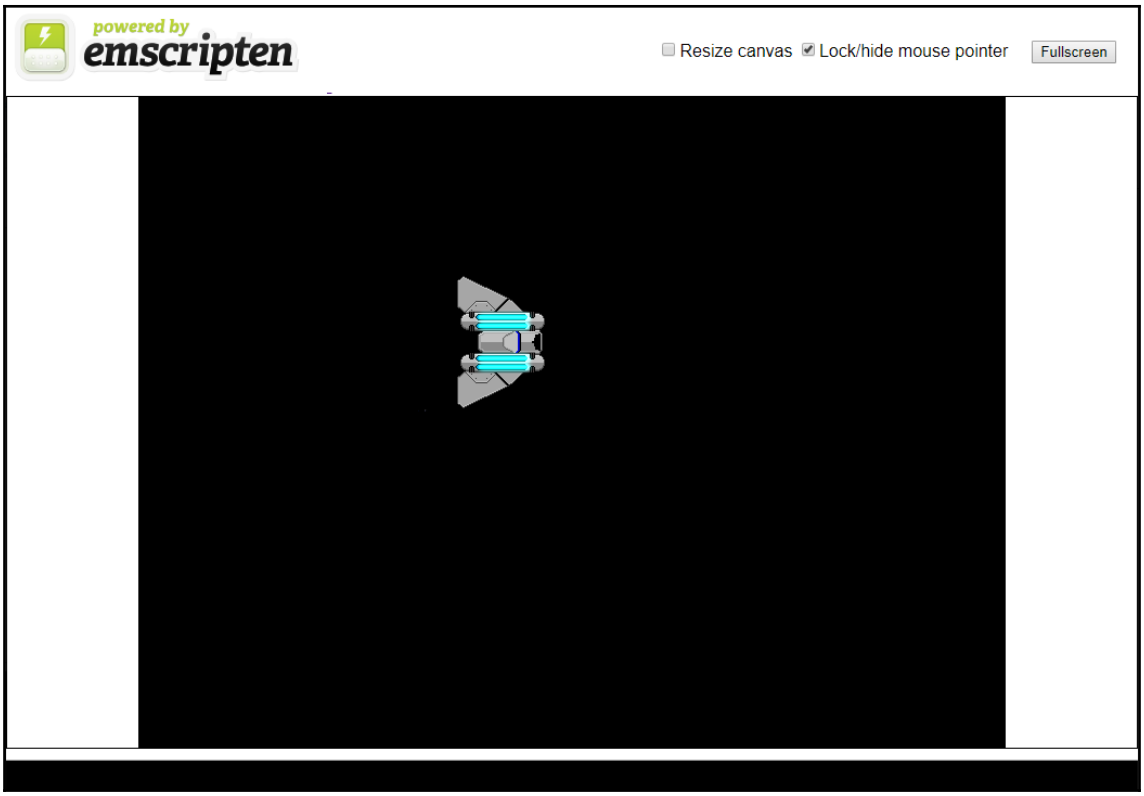

GAME OVER
PLAY AGAIN

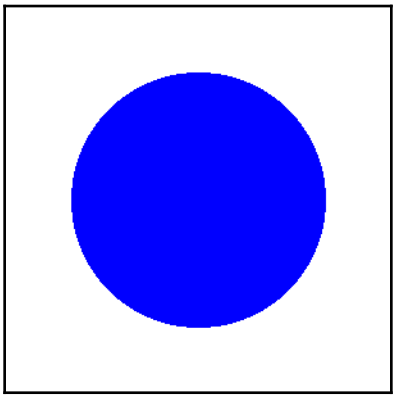

Normal
PLAY
Clicked
PLAY
Hover
PLAY

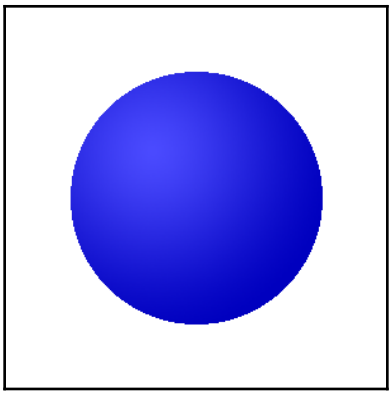

powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
SPACE WARRIOR
Use Arrow keys to move
Use space to shoot
Press 'f' key for forcefield
PLAY
success creating asteroid texture
success creating asteroid surface
success creating asteroid texture
success creating asteroid surface
success creating asteroid texture
success creating asteroid surface
success creating asteroid texture
success creating ui button surface

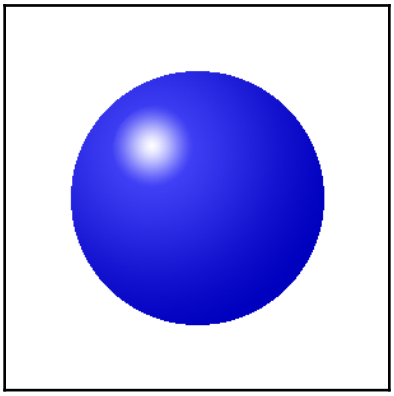
Chapter 15: Shaders and 2D Lighting




powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen

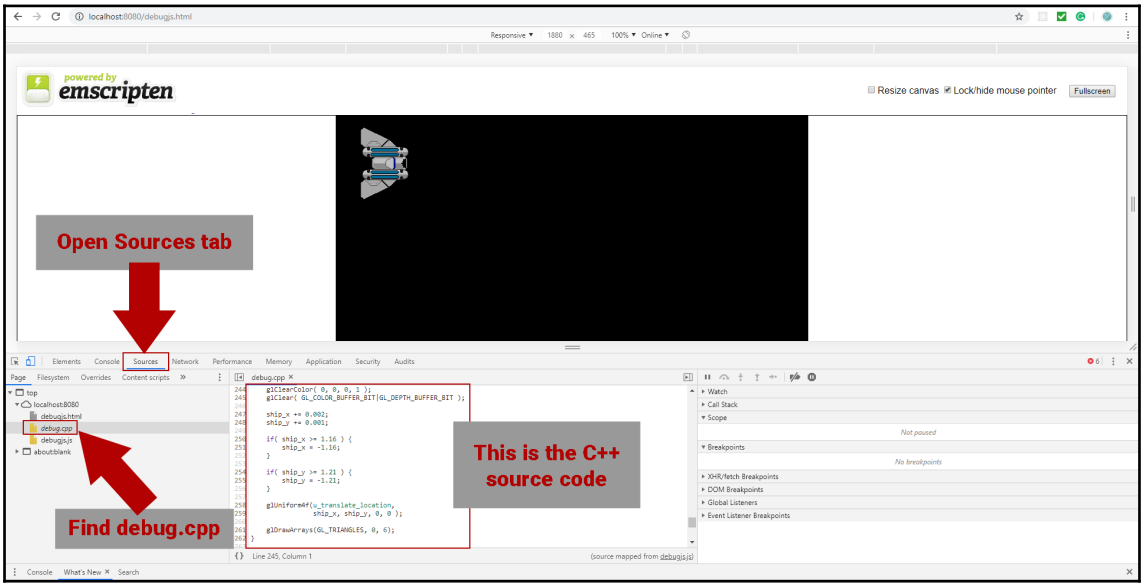


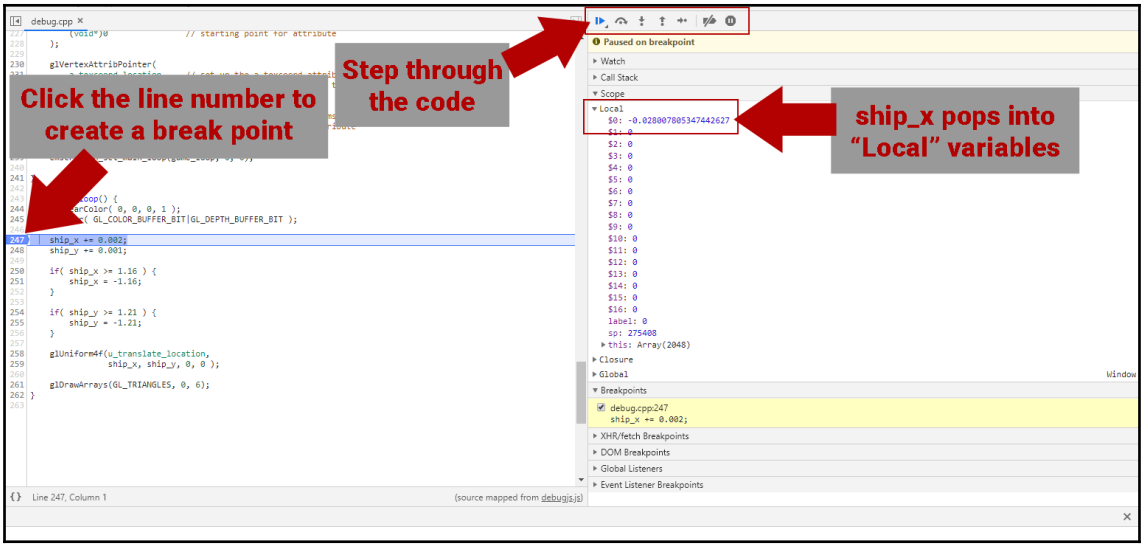


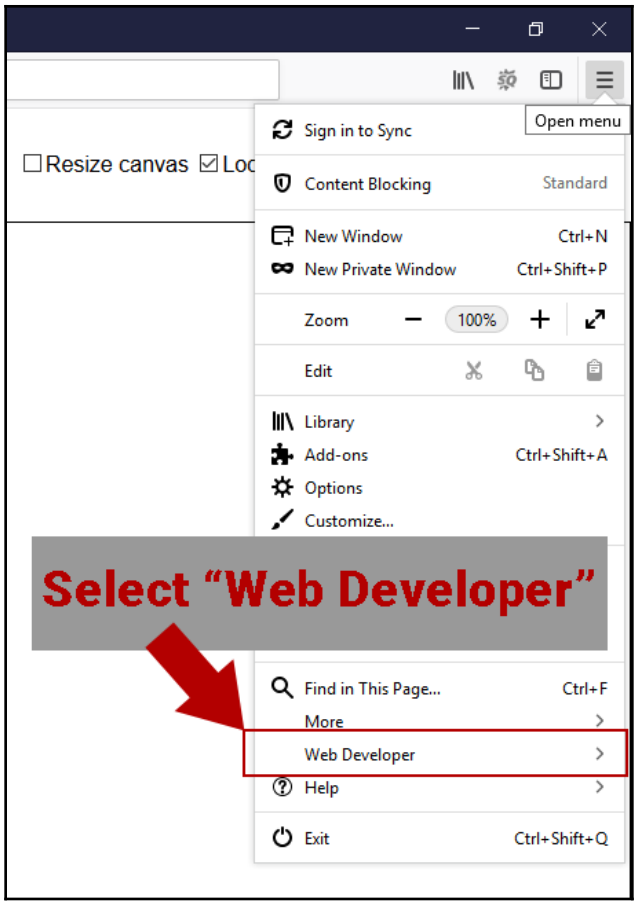


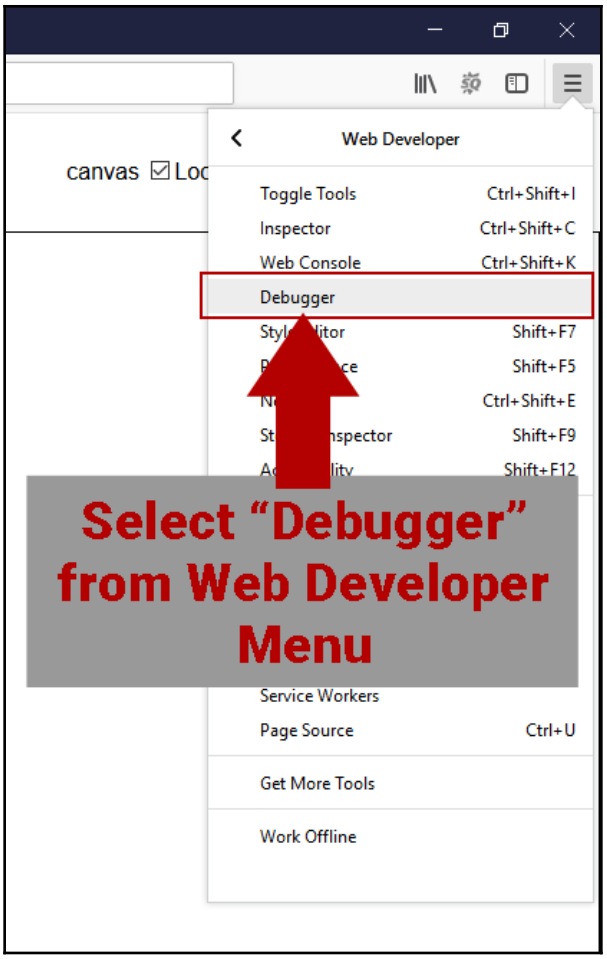

powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen

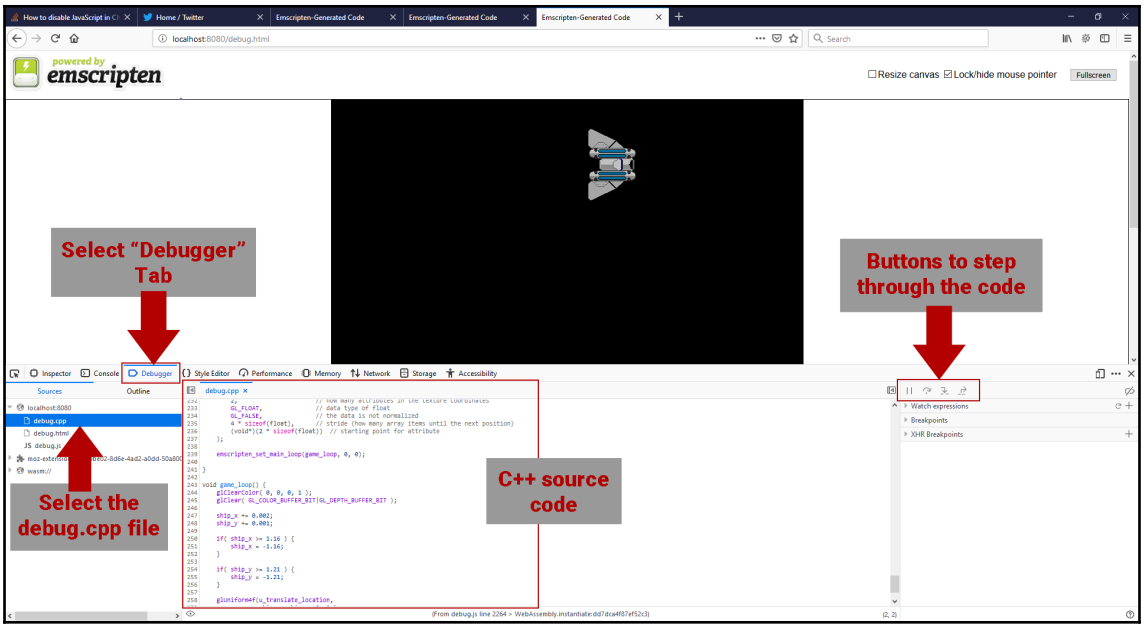
Chapter 16: Debugging and Optimization

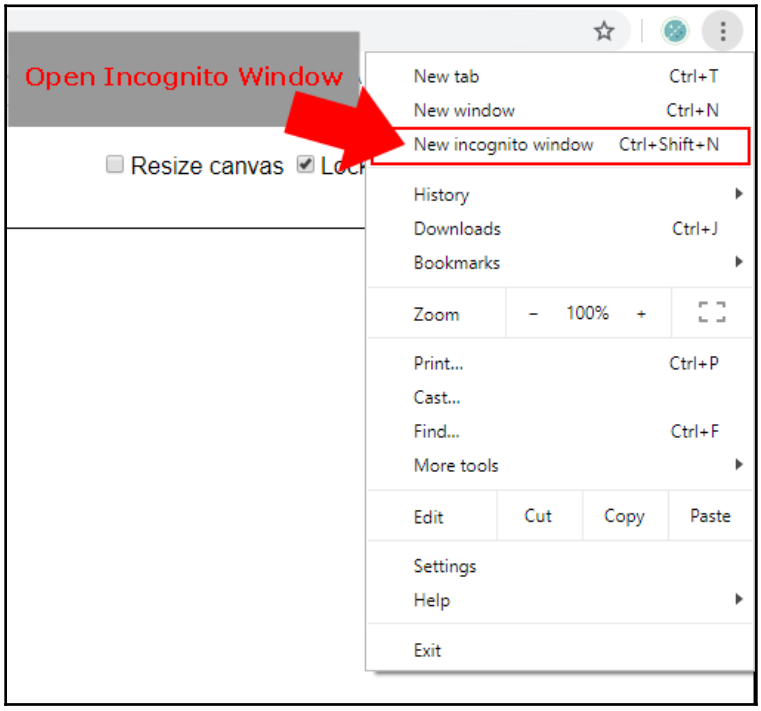


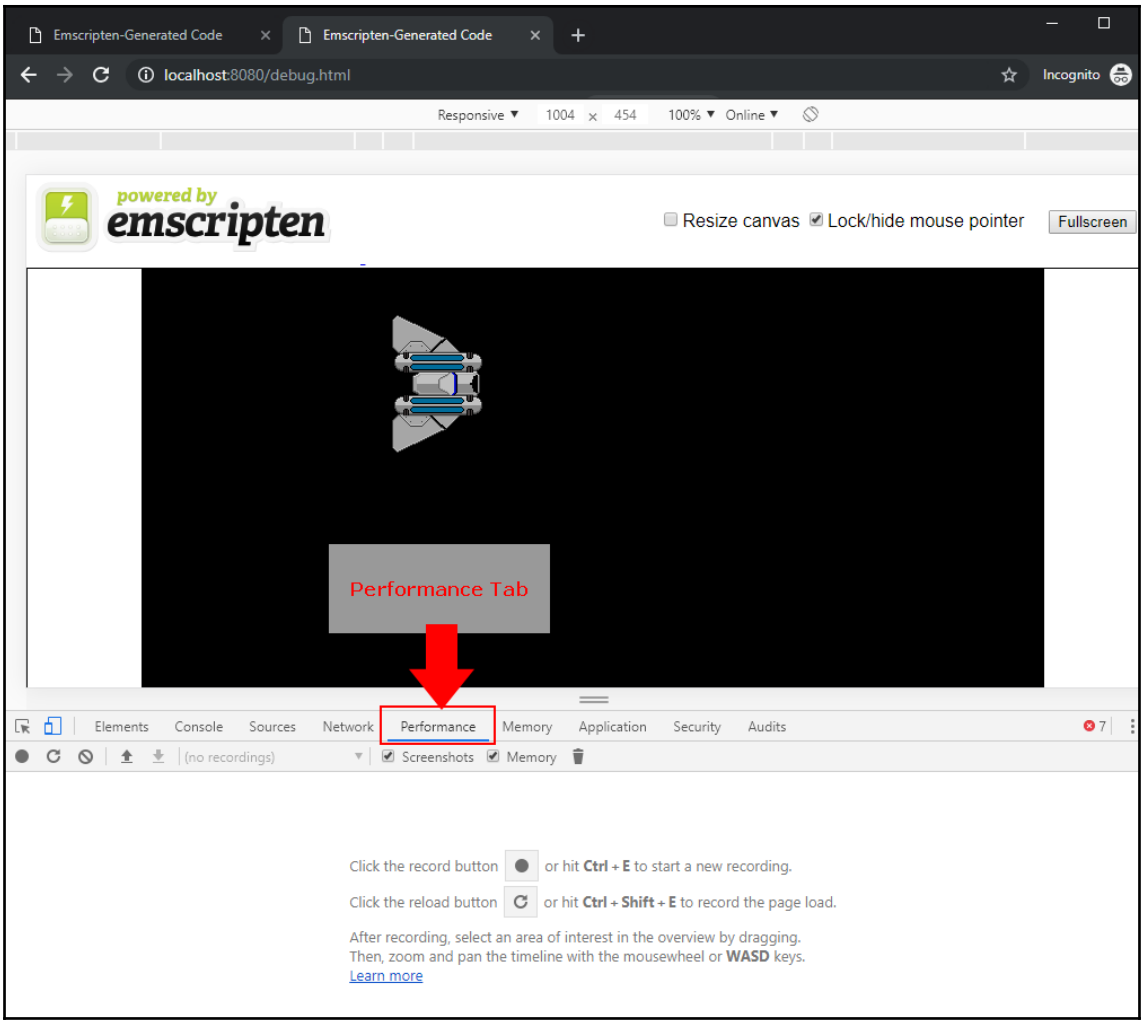

Click the line number to create a break point
Step through the code
ship_x pops into "Local" variables
debug.cpp
Paused on breakpoint
Watch
Call Stack
Scope
Local
$0: -0.028007805347442627
Closure
Global
Breakpoints
debug.cpp:247
ship_x += 0.002;
XHR/fetch Breakpoints
DOM Breakpoints
Global Listeners
Event Listener Breakpoints
Line 247, Column 1

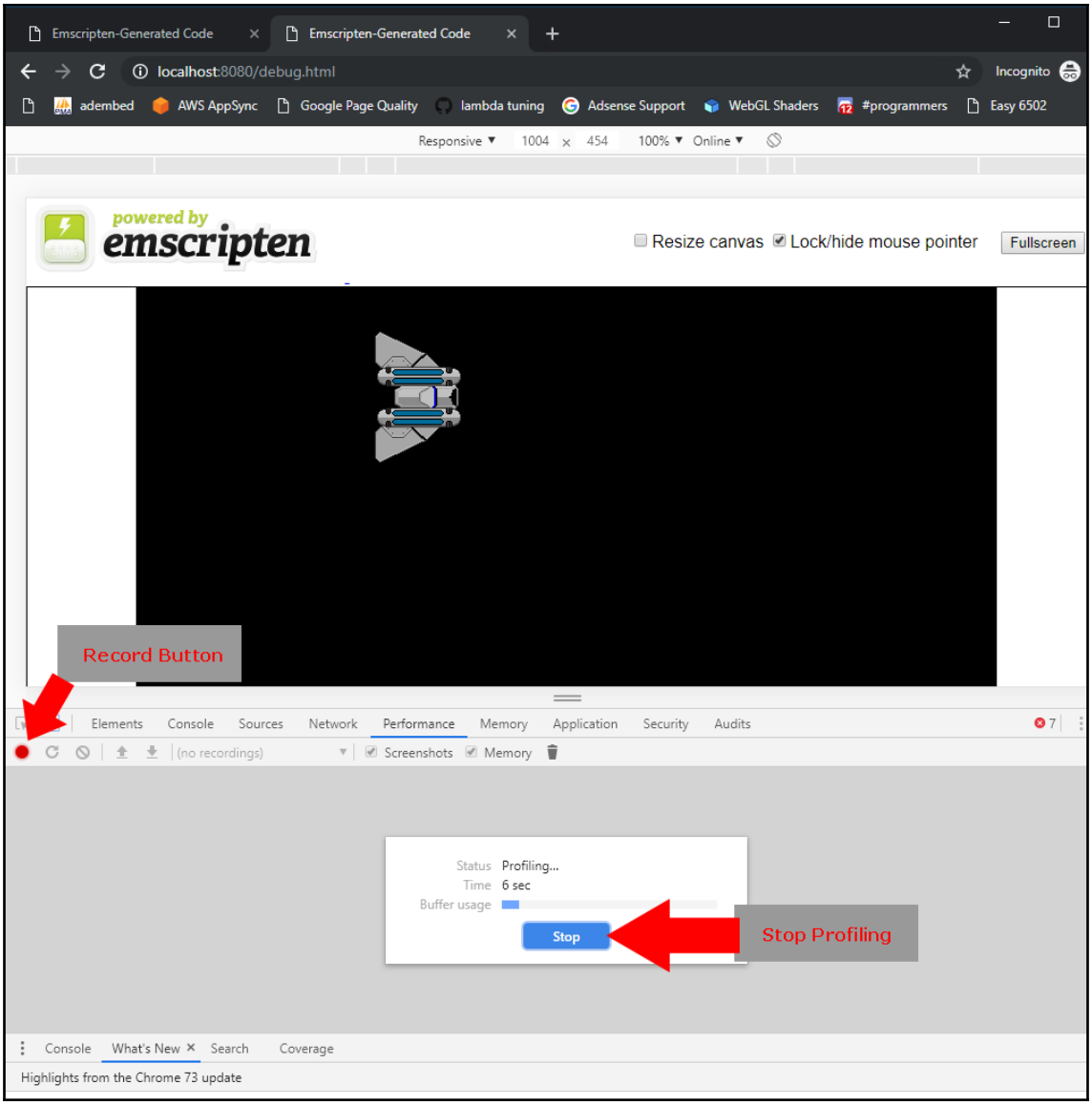

Resize canvas
Open menu
Sign in to Sync
Content Blocking
Standard
New Window
Ctrl+N
New Private Window
Ctrl+Shift+P
Zoom
100%
Edit
Library
Add-ons
Ctrl+Shift+A
Options
Customize...
Select “Web Developer”
Find in This Page...
Ctrl+F
More
Web Developer
Help
Exit
Ctrl+Shift+Q

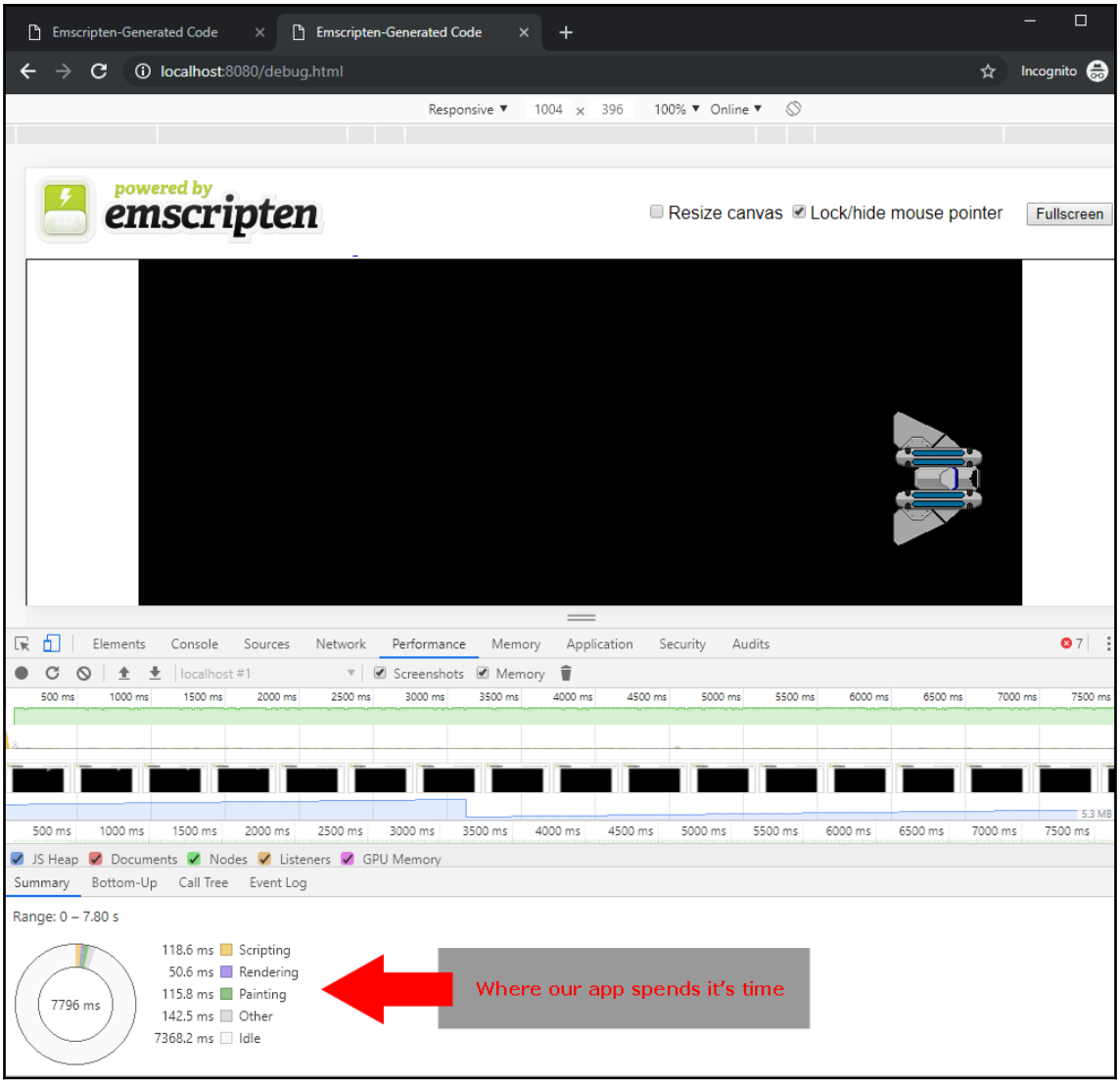

canvas
Web Developer
Toggle Tools Ctrl+Shift+I
Inspector Ctrl+Shift+C
Web Console Ctrl+Shift+K
Debugger
Shift+F7
Shift+F5
Ctrl+Shift+E
Shift+F9
Shift+F12
Select "Debugger" from Web Developer Menu
Service Workers
Page Source Ctrl+U
Get More Tools
Work Offline

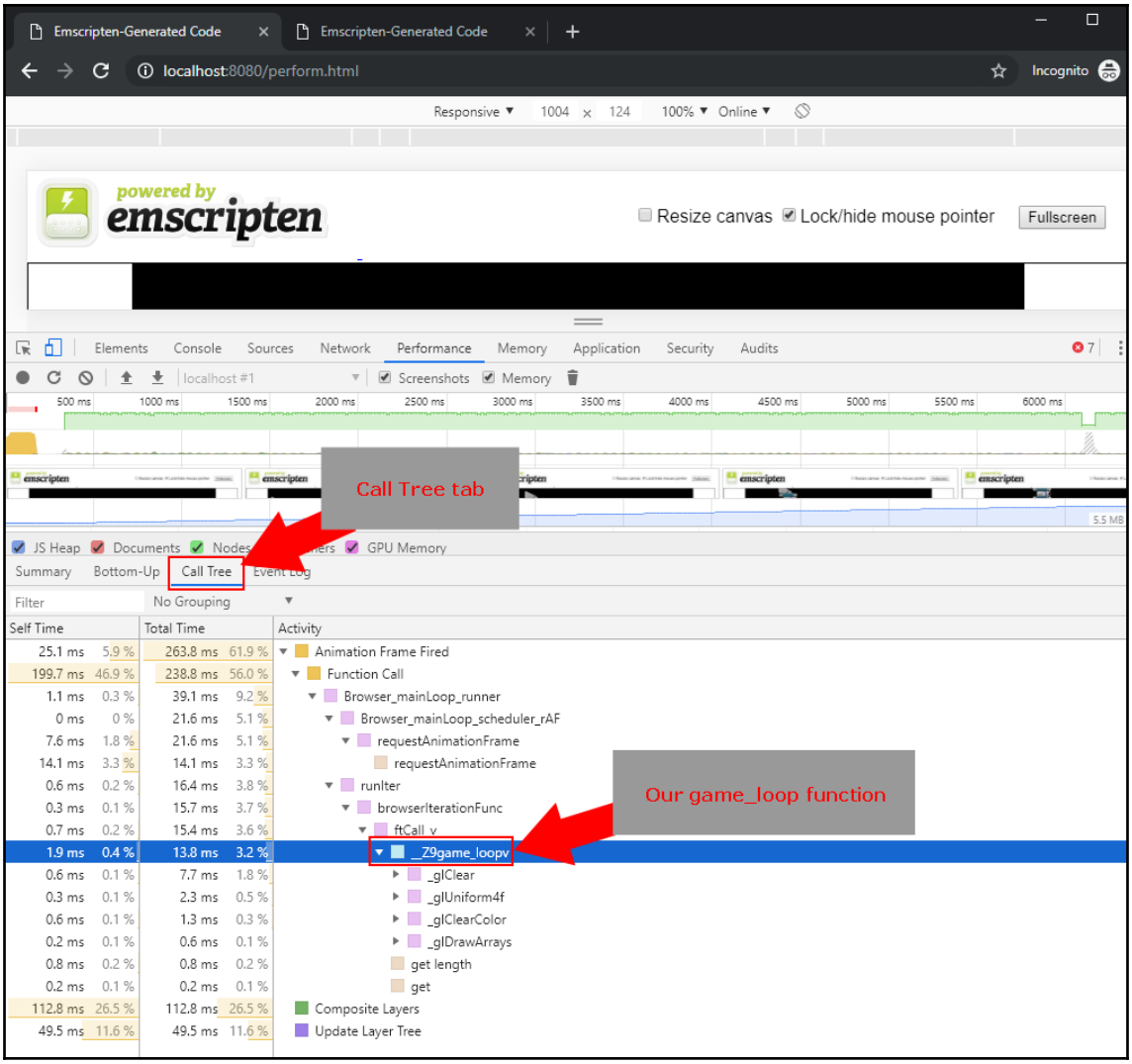

Select "Debugger" Tab
Buttons to step through the code
Select the debug.cpp file
C++ source code


Open Incognito Window
New tab Ctrl+T
New window Ctrl+N
New incognito window Ctrl+Shift+N
History
Downloads Ctrl+J
Bookmarks
Zoom − 100% +
Print... Ctrl+P
Cast...
Find... Ctrl+F
More tools
Edit Cut Copy Paste
Settings
Help
Exit


Emscripten-Generated Code
Emscripten-Generated Code
localhost:8080/debug.html
Incognito
Responsive
1004 x 454
100% Online
powered by emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
Performance Tab
Elements
Console
Sources
Network
Performance
Memory
Application
Security
Audits
(no recordings)
Screenshots
Memory
Click the record button or hit Ctrl + E to start a new recording.
Click the reload button or hit Ctrl + Shift + E to record the page load.
After recording, select an area of interest in the overview by dragging.
Then, zoom and pan the timeline with the mousewheel or WASD keys.
Learn more


Emscripten-Generated Code
Emscripten-Generated Code
localhost:8080/debug.html
Incognito
adembed
AWS AppSync
Google Page Quality
lambda tuning
Adsense Support
WebGL Shaders
#programmers
Easy 6502
Responsive
1004
454
100%
Online
powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
Record Button
Elements
Console
Sources
Network
Performance
Memory
Application
Security
Audits
(no recordings)
Screenshots
Memory
Status
Profiling...
Time
6 sec
Buffer usage
Stop
Stop Profiling
Console
What's New
Search
Coverage
Highlights from the Chrome 73 update


Emscripten-Generated Code
Emscripten-Generated Code
localhost:8080/debug.html
Incognito
Responsive
1004
396
100%
Online
powered by
emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
Elements
Console
Sources
Network
Performance
Memory
Application
Security
Audits
Screenshots
Memory
JS Heap
Documents
Nodes
Listeners
GPU Memory
Summary
Bottom-Up
Call Tree
Event Log
Range: 0 – 7.80 s
7796 ms
118.6 ms Scripting
50.6 ms Rendering
115.8 ms Painting
142.5 ms Other
7368.2 ms Idle
Where our app spends it's time


Emscripten-Generated Code
Emscripten-Generated Code
localhost:8080/perform.html
Incognito
Responsive
1004 x 124
100%
Online
powered by emscripten
Resize canvas
Lock/hide mouse pointer
Fullscreen
Elements
Console
Sources
Network
Performance
Memory
Application
Security
Audits
Screenshots
Memory
Call Tree tab
JS Heap
Documents
Nodes
GPU Memory
Summary
Bottom-Up
Call Tree
Filter
No Grouping
Self Time
Total Time
Activity
Animation Frame Fired
Function Call
Browser_mainLoop_runner
Browser_mainLoop_scheduler_rAF
requestAnimationFrame
requestAnimationFrame
runIter
browserIterationFunc
ftCall_v
__Z9game_loopv
_glClear
_glUniform4f
_glClearColor
_glDrawArrays
get length
get
Composite Layers
Update Layer Tree
Our game_loop function