Welcome to Outfit7 Technical Test. Test is made of two parts: Game Test, Technical Question.

Game Test

This test allows us to see how you work on real tasks, your level of expertise and knowledge in C++, architecture, best programming practices and coding in general.

You are required to develop a small game in C++, taking as a reference Space Invaders:
https://en.wikipedia.org/wiki/Space_Invaders
https://www.youtube.com/watch?v=MU4psw3ccUI

The basic features (2D version) are:

- Player (Spaceship)
  - Player can move on the screen (using arrows keys)
  - Player can shoot projectiles (using spacebar)
- Enemies:
  - Enemies move towards the spaceship.
  - Enemies have life points (e.g 3, up to you to decide).
  - Enemies may shoot as well.
- Implement Obstacles (Rocks):
  - They are static objects in the level.
  - They have life points (up to you to decide).
  - They can be hit by the player's projectiles.
  - They CAN NOT be hit by enemies while moving.
  - They CAN NOT be hit by enemies' projectiles.
- Player Projectile:
  - It is shot from Spaceship.
  - It can hit Obstacles.
  - It can hit Enemies
- Enemy Projectile:
  - It is shot from Enemy.
  - It can only hit the player.
- Basic UI:
  - Score
  - Hi-Score from the past rounds.

You are free and welcome to be creative, as long as the basic features are fulfilled. Decide and create your own mechanics (level based, endless, etc…). Give your enemies the AI you prefer, feel free to create different ones. Do whatever you want with animations and effects.
We provide you some standard, royalty free assets (Source: https://opengameart.org/content/complete-spaceship-game-art-pack) but you are free to choose any graphical asset you want.

You should use the basic project (Visual Studio or XCode) based on SDL sent with this document, however you are free to choose any other low level framework (i.e. Cocos, SFML…) but not any game engine (e.g. Unity, Unreal, CryEngine etc).

Please, provide according to the deadline, a compressed archive with the source code, the project and any other third party libraries needed. Please test your solution carefully, it is mandatory that we can open the project, compile and run the game with no effort from our side. Feel free to contact us for questions, we will try to get back to you as soon as possible.
Good luck!

Technical Question

Video game experience has to be fluid and engaging. For that reason, performance is very important. Can you list and describe what strategies can be used to optimize and improve performance of a mobile game? It can be related with GPU, CPU, rendering, I/O operations, concurrency, compression algorithms, animations, assets, etc. For every technique you think of, provide an explanation of how it works.