

Tema 1 – Realizarea imaginilor mosaic

Acest pdf contine mozaicurile cerute in cadrul subpunctelor temei.

(a) Valoarea parametrului *num_pieces_horizontal* influenteaza “rezolutia” mozaicului. Daca alegem o valoare mica, precum 25, mozaicul rezultat nu va fi in stare sa redea detaliile din imaginea originala. Asemanarea dintre imaginea mozaic si cea originala este destul de mica. De la 50 in sus, mozaicul seamana destul de bine cu imaginea originala, detaliile devenind vizibile.

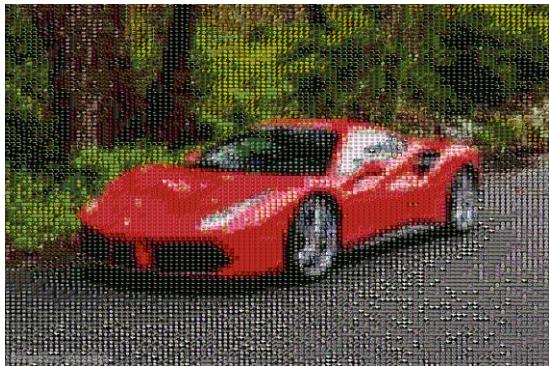
Folosirea criteriului distantei euclidiene dintre culorile medii ne permite sa punem mereu in mozaic piesa cu culoarea “per total” cea mai apropiata de culoarea zonei respective din imaginea originala si astfel sa avem o diferență cat mai mica fata de imaginea originala.

Pentru imaginile “adams” si “obama”, am convertit la grayscale imaginile mici cu flori pentru ca mozaicurile sa fie si ele grayscale, la fel ca imaginile originale. (grayscale cu 3 canale egale)

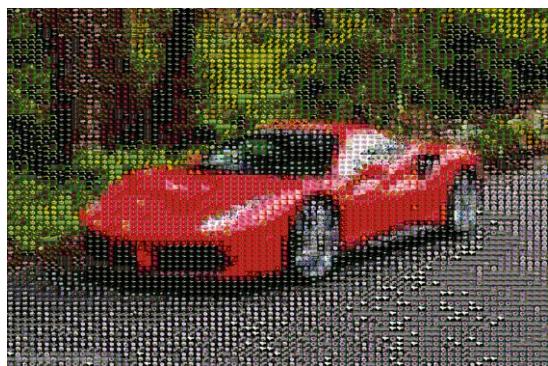
Mozaicuri obtinute cu modul de aranjare “caroaj”:



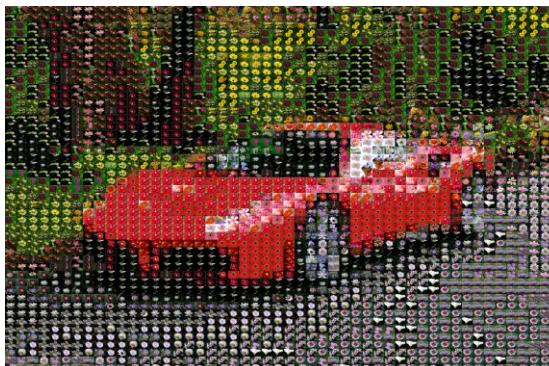
Poza originala “Ferrari”



num_pieces_horizontal = 100



num_pieces_horizontal = 75



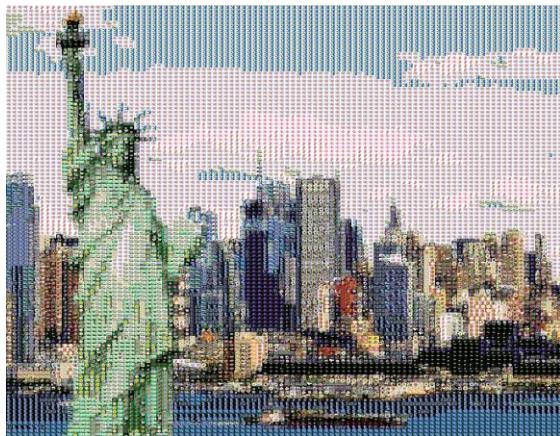
num_pieces_horizontal = 50



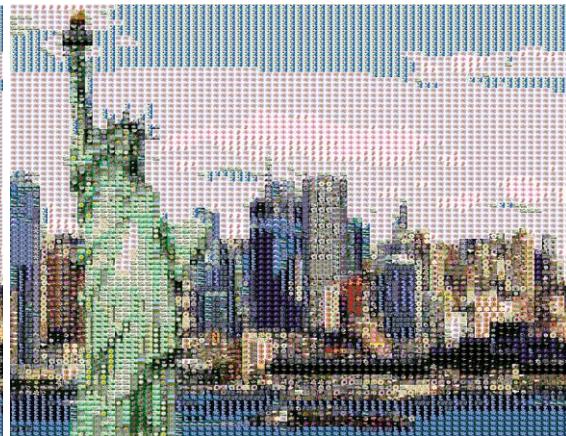
num_pieces_horizontal = 25



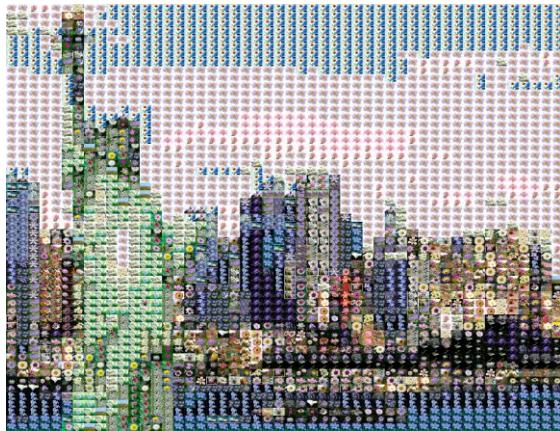
Poza originala “liberty”



num_pieces_horizontal = 100



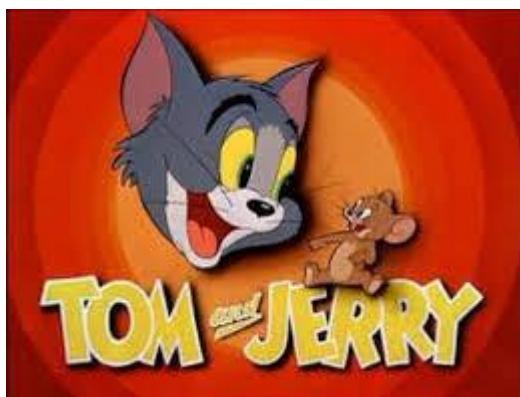
num_pieces_horizontal = 75



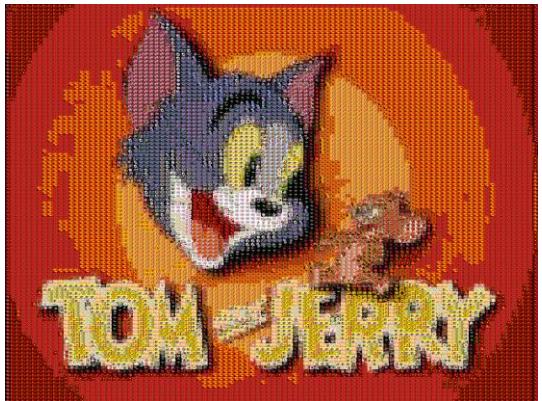
num_pieces_horizontal = 50



num_pieces_horizontal = 25



Poza originala “tomJerry”



num_pieces_horizontal = 100



num_pieces_horizontal = 75



num_pieces_horizontal = 50



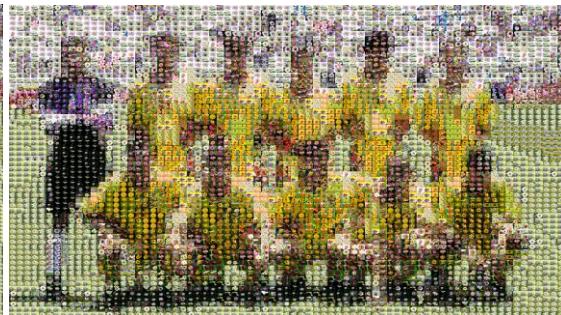
num_pieces_horizontal = 25



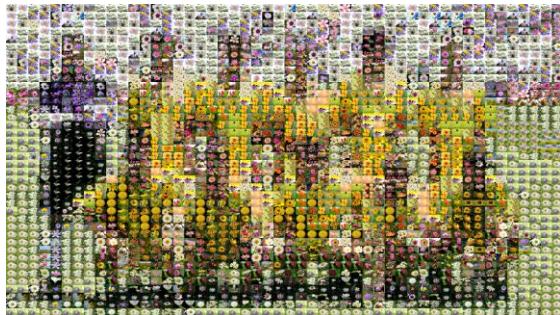
Poza originala “Romania”



num_pieces_horizontal = 100



num_pieces_horizontal = 75



num_pieces_horizontal = 50



num_pieces_horizontal = 25



Poza originala “Obama”



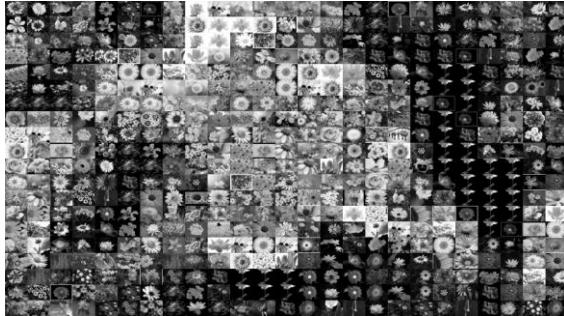
num_pieces_horizontal = 100



num_pieces_horizontal = 75



num_pieces_horizontal = 50



num_pieces_horizontal = 25



Poza originala "adams"



num_pieces_horizontal = 100



num_pieces_horizontal = 75



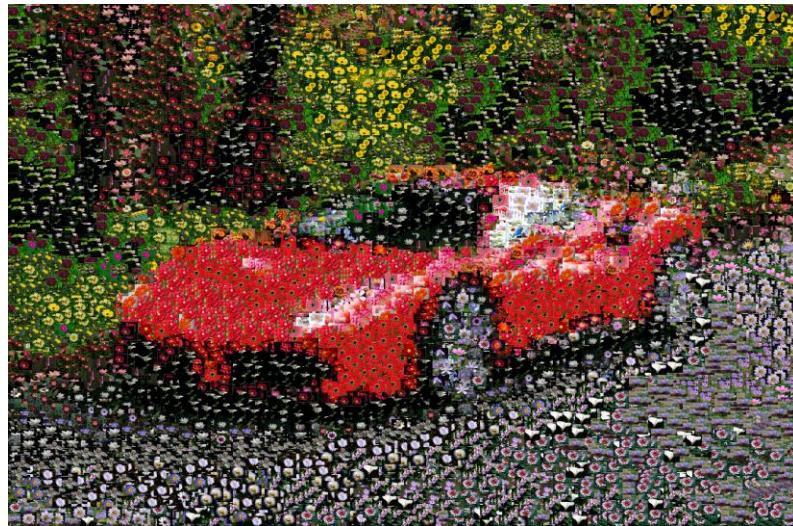
num_pieces_horizontal = 50

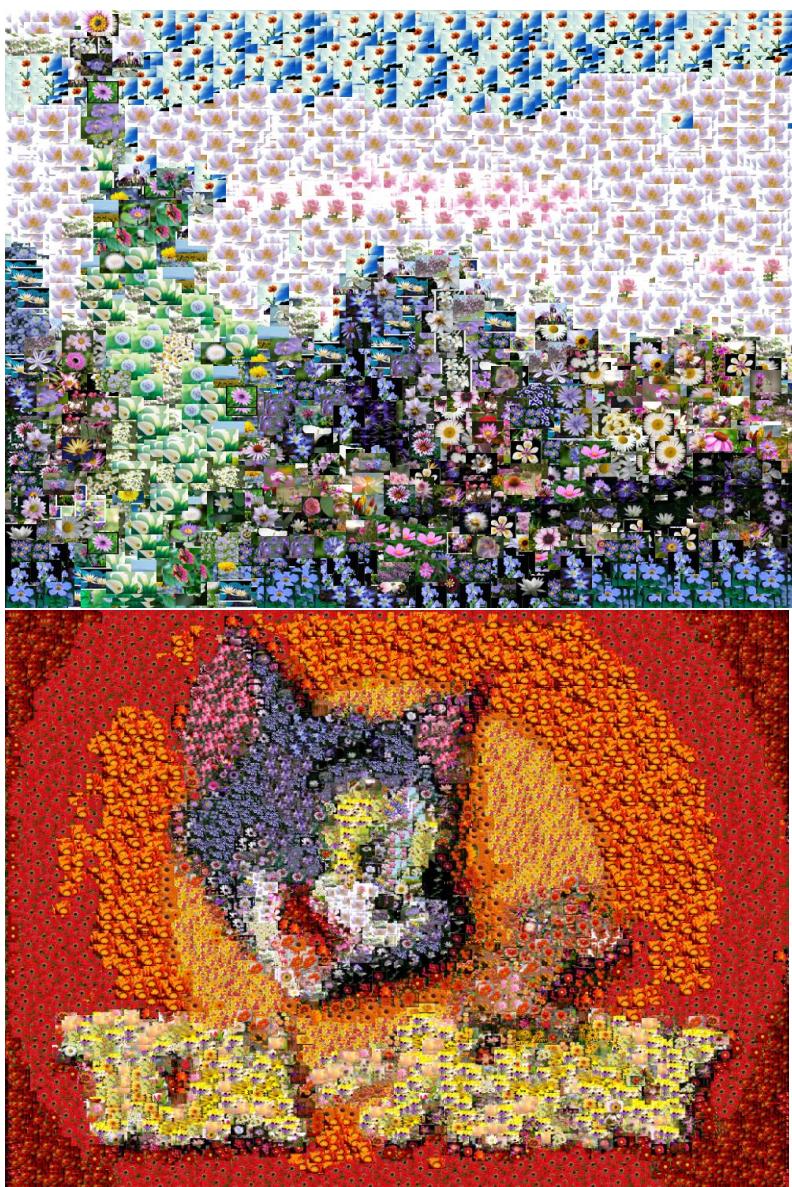


num_pieces_horizontal = 25

- (b) Ideea de baza: am o lista cu pozitiile (x,y) a fiecarui pixel care poate fi ales drept colt stanga-sus al unei piese din mozaic. Pentru a creste viteza algoritmului, am ales pixelii din $n \times n$, unde n este latimea unei piese mici / 5. Analog si cand trec la randul urmator, sar $m - 1$ randuri, unde m este inaltimea unei piese mici / 5. La fiecare pas aleg random un astfel de posibil colt, pun piesa cea mai potrivita si elimin coltul din lista pentru a nu il alege din nou pe viitor.

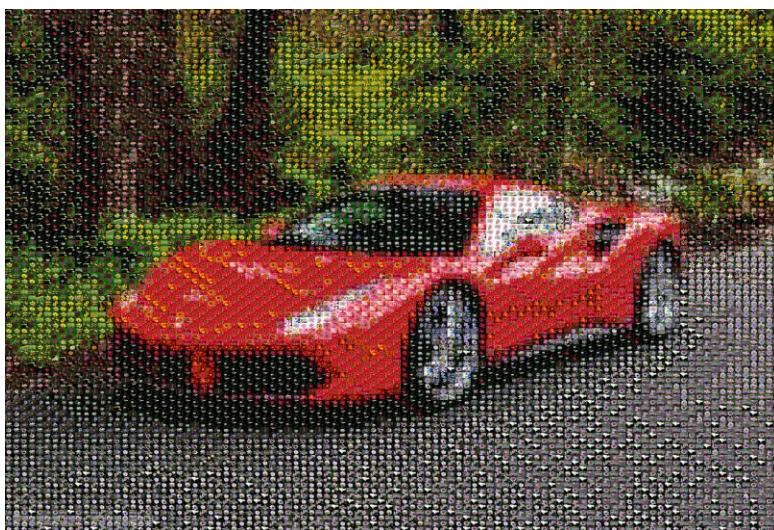
Mozaicurile obtinute pentru modul de aranjare “aleator”, cu $num_pieces_horizontal = 50$: (liberty are $num_pieces_horizontal = 25$)

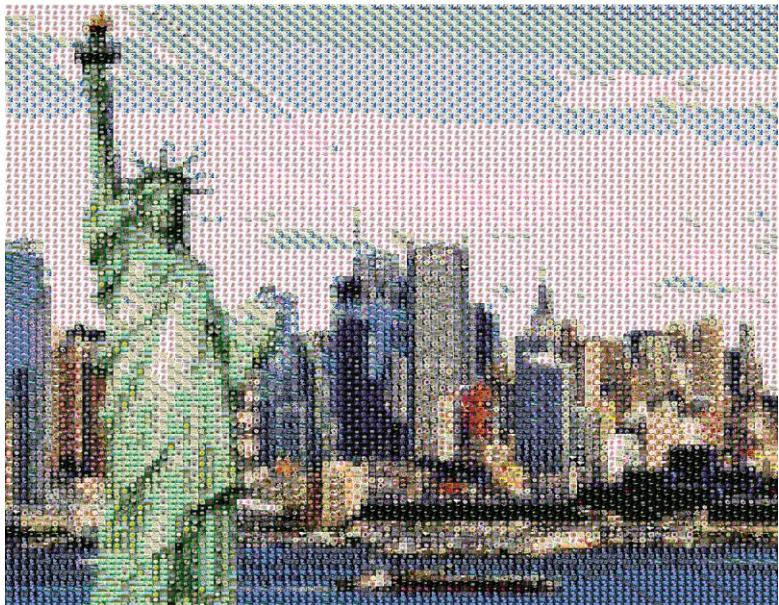






- (c) Mozaicurile obtinute pentru modul de aranjare “*caroaj*”, fiecare piesă având vecinii (stanga, dreapta, sus, jos) diferiti de ea și cu $num_pieces_horizontal = 100$:







- (d) Am folosit colectia "Cifar-10" si am realizat mozaicuri tematice pentru 5 dintre cele 10 clase posibile, si anume: *dog, cat, bird, frog, ship*,. Am folosit modul de aranjare "caroiaj" si *num_pieces_horizontal = 75*.



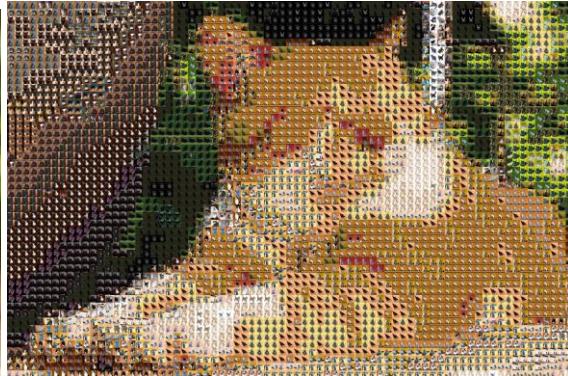
Poza originala "dog"



Mozaic "dog"



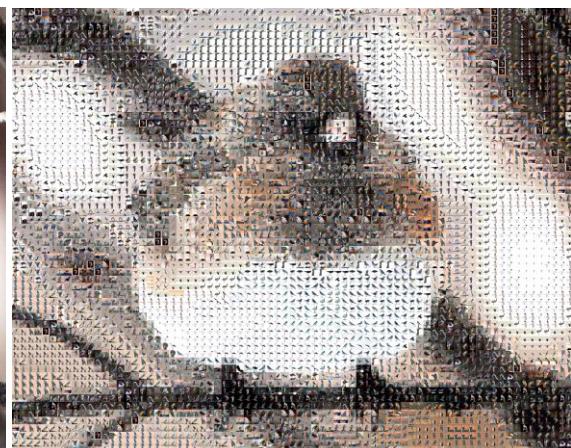
Poza originala "cat"



Mozaic "cat"



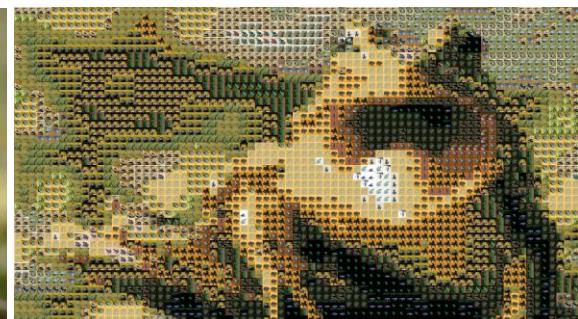
Poza originala "bird"



Mozaic "bird"



Poza originala "frog"



Mozaic "frog"

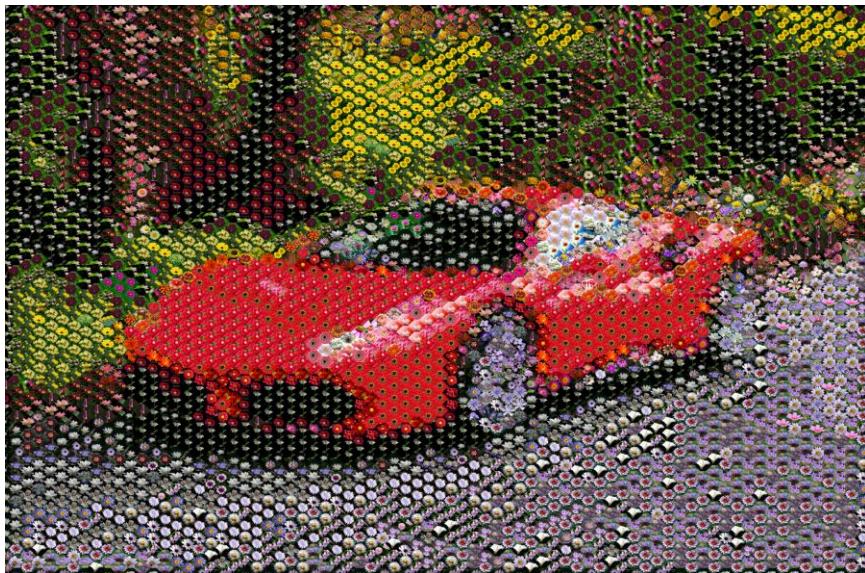


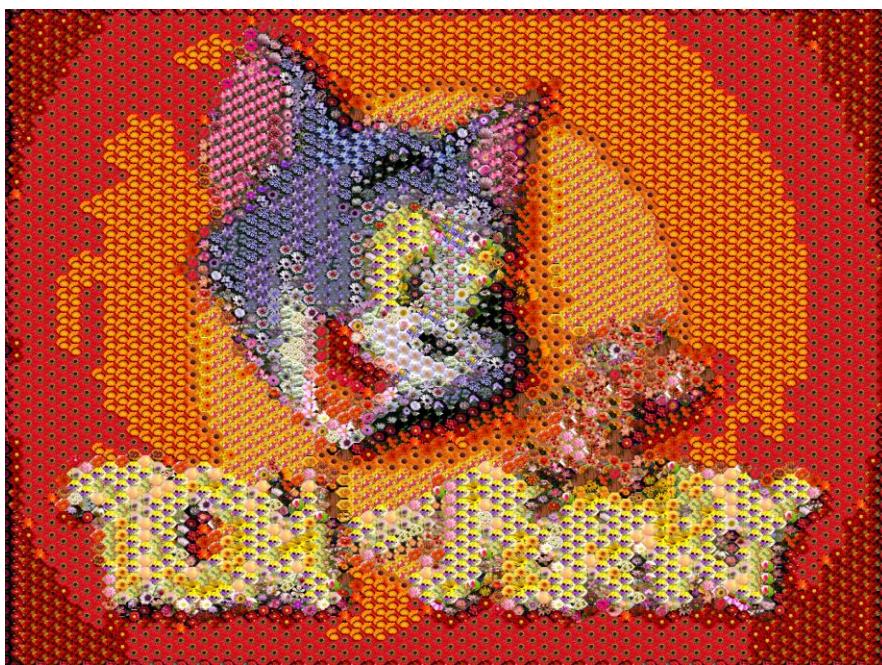
Poza originala "ship"

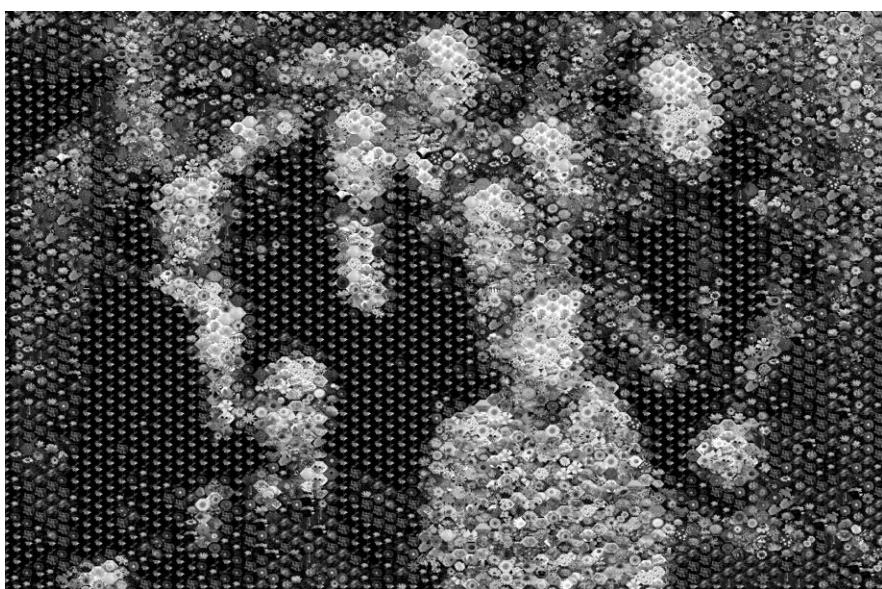
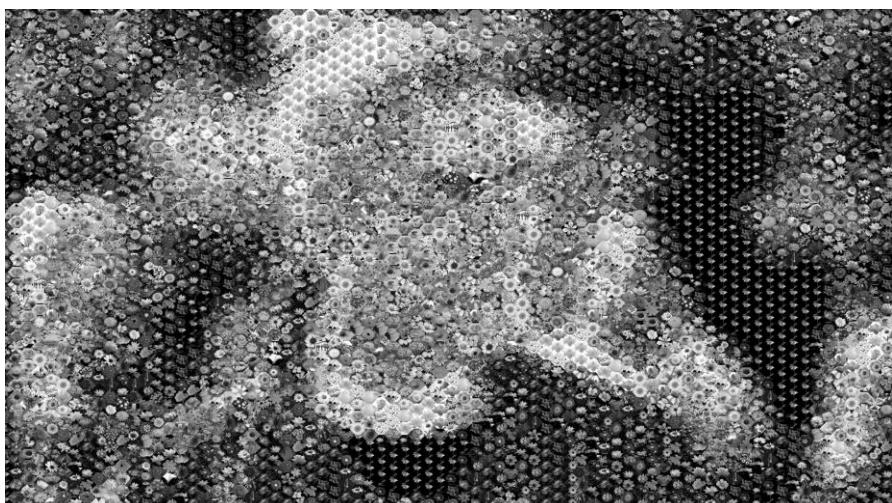
Mozaic "ship"

- (e) Pentru mozaicuri cu piese hexagonale, am facut o *masca* in forma de hexagon si am aplicat-o imaginilor mici pentru a face pixelii de pe margine negri. Am impartit hexagoanele in 2 categorii si le-am asezat intai pe cele din prima categorie, apoi pe celelalte. Pentru a nu avea pixeli negri pe margini, initial am construit un mozaic putin mai mare si la final am decupat dupa dimensiunea imaginii originale (dupa resize).

Mozaicurile realizate cu piese hexagonale, mod de aranjare "*caroiaj*" si *num_pieces_horizontal = 50*:







- (f) Ideea de baza: am retinut intr-o matrice indicele fiecarei piese puse deja in mozaic si mereu cand puneam o piesa noua verificam sa nu fie identica cu vreo piesa adiacenta. Daca era identica, alegeam urmatoarea piesa ca asemanare a culorii medii (tot repet pana gasesc prima piesa diferita de cele adiacente).

Mozaicurile realizate cu piese hexagonale, mod de aranjare “*caroiaj*”,
num_pieces_horizontal = 50, fiecare piesa avand toate piesele adiacente diferite de ea:

