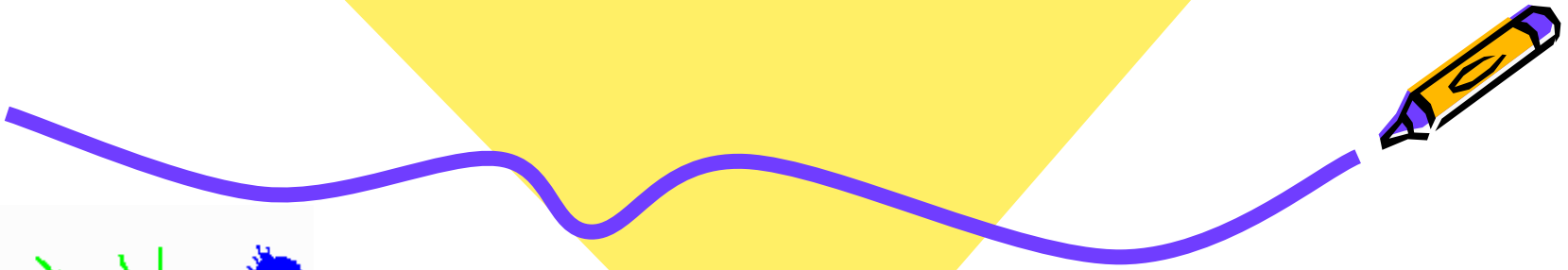
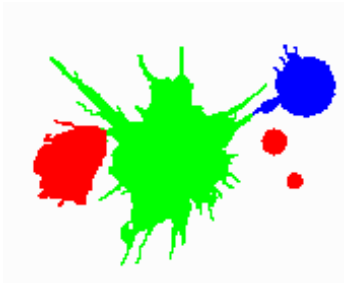
# Sisteme software de prelucrarea imaginilor

Desenare vectoriala





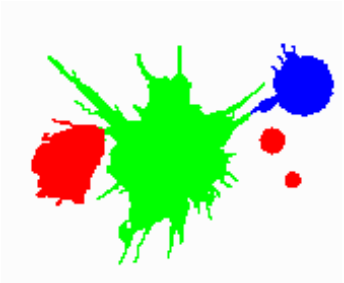
**Sisteme Software de Prelucrarea Imaginilor**
S.l. Dr. ing. Laura Florea
LAPI

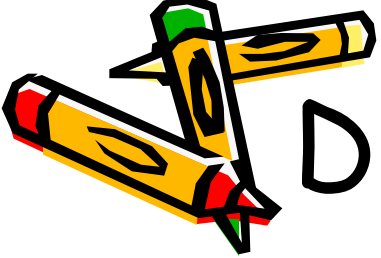




# Imagini vectoriale

- Grafica vectorială este un procedeu prin care imaginile sunt construite cu ajutorul descrierilor matematice
- Sunt realizate din linii si curbe definite ca obiecte matematice
- Imaginile vectoriale sunt complementare imaginilor bitmap, din grafica raster, în care imaginile sunt reprezentate ca un tablou de pixeli.

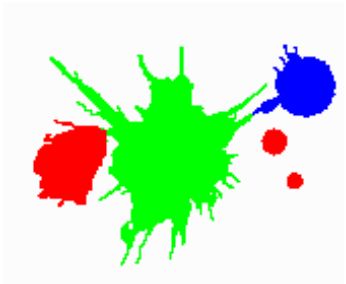




# De ce folosim imagini vectoriale?



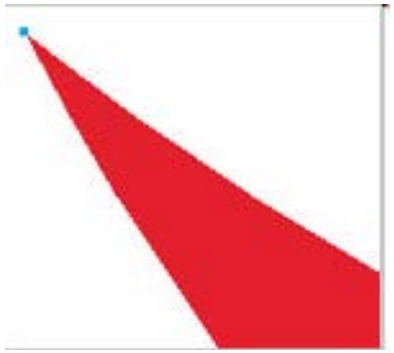
- Isi pastreaza aspectul la translatie, scalare, rotatie sau schimbare de culoare (independete de rezolutie)
- Utilizare: logouri, ilustratii, text, desene sau alte forme pe care le vom folosi in diferite dimensiuni



# Diferente



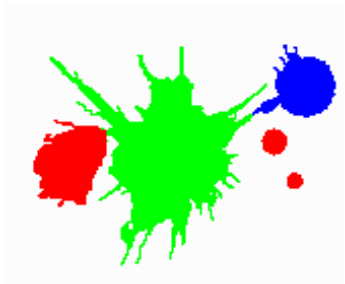
Imaginea vectoriala la dimensiune normala



Detaliu din imaginea vectoriala la 1600%



Detaliu din imaginea rasterizata la 1600%



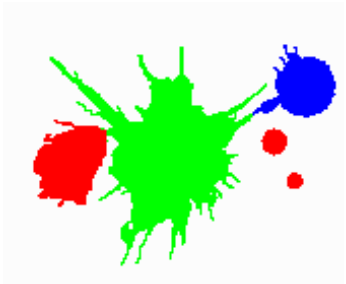




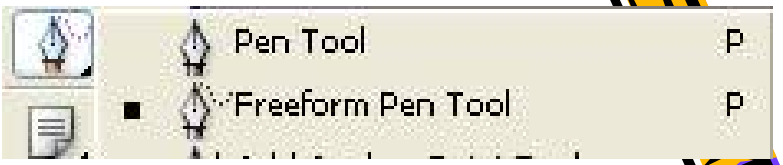
# Utilizare

- Putem transforma o imagine raster in imagine vectoriala pentru a o folosi in mai multe dimensiuni si la o calitate buna. Numarul obiectelor generate va fi proportional cu complexitatea imaginii.

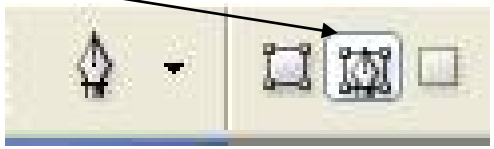
- Se pot folosi combinatii intre imaginile raster si cele vectoriale



# Caile




- Cale = conturul unei forme vectoriale
  = linie dreapta sau curba
- Se deseneaza cu instrumentele *Pen* sau *Freeform Pen* (care include si *Magnetic Pen*) cu optiunea *Paths* selectata (*Shift+P* pentru a le schimba intre ele)



- Caile pot fi
  - deschise – cu doua capete distincte
  - inchise – continue
- Cu optiunea *Rubber Band* se poate vedea calea inainte de a fi definitivata

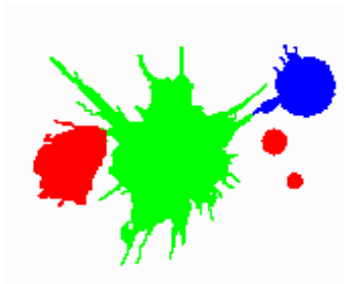


# Folosirea instrumentului *Pen*



- Pentru crearea unei *cai drepte*:
  - Primul click = punctul de pornire
  - Al doilea click = punctul de oprire / un nou punct de pornire
- Orice astfel de punct se numeste punct de *ancorare*



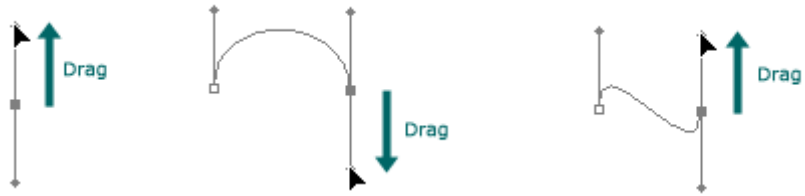


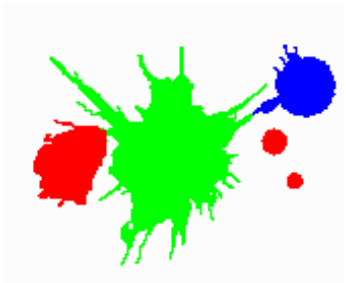


# Folosirea instrumentului *Pen*

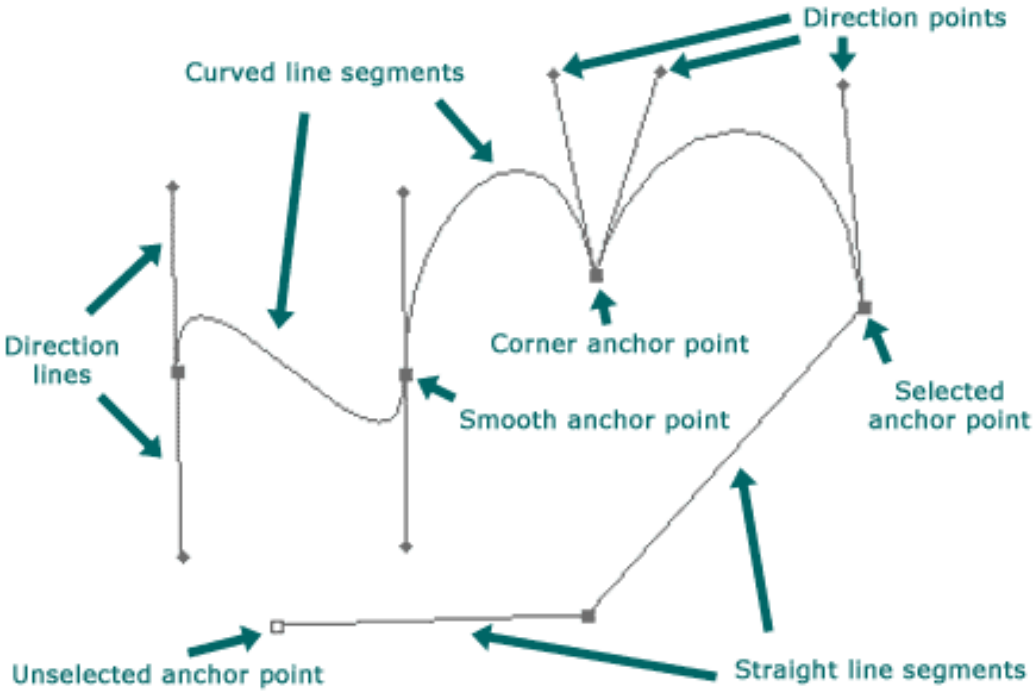


- Pentru crearea unei *cai curbe*:
  - Se plaseaza un punct de ancorare
  - Se trage cu mouse-ul pentru a crea o directie. Fiecare *linie de directie* se termina cu doua *puncte de directie*.
  - Se plaseaza al doilea punct de ancorare
- Liniile de directie determina directia in care se va indrepta noua curba
- Lungimea liniei determina cat de multa influenta are punctul de ancora asupra curbei (cu cat mai lunga linia, cu atat curba va fi mai trasa catre ea)



# Folosirea instrumentului *Pen*



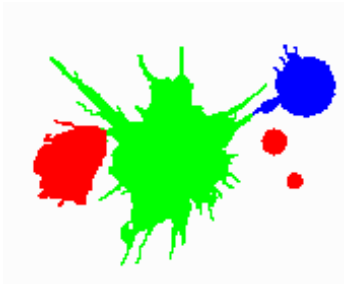

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# Folosirea instrumentului *Pen*

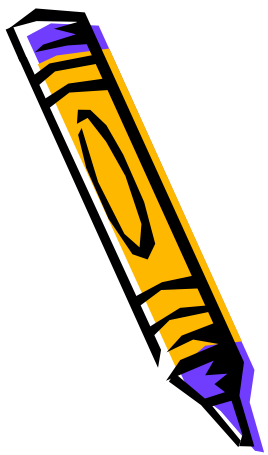


- Curbele line sunt conectate prin puncte de curbura line *(smooth points).*
  - Curbele din ambele parti ale punctului de curbura lina intra si ies din punct la acelasi unghi
  - Punctul de curbura lina are liniile directionale la 180°
- Caile curbate puternic sunt conectate prin puncte de colt (*corner points*).
  - Curbele de o parte si de alta a unui punct de colt isi schimba brisc directia una fata de alta
  - Punctul de colt are liniile directionale la un unghi diferit de 180°
  - Punctul de colt se foloseste si pentru unirea a doua cai drepte

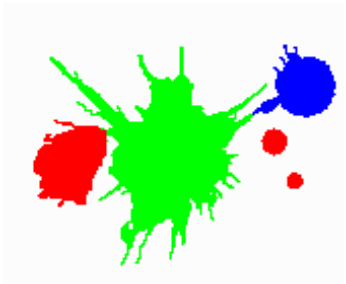




# Folosirea instrumentului *Pen*

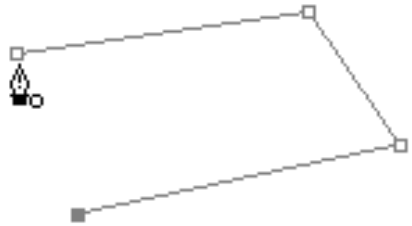


- Cand se modifica o linie de directie a unui punct de curbura lina sunt ajustate simultan segmentele curbe aflate de ambele parti ale punctului.
- Cand se modifica o linie de directie a unui punct de colt e ajustata numai curba aflata de aceeasi parte a punctului ca si linia de directie.



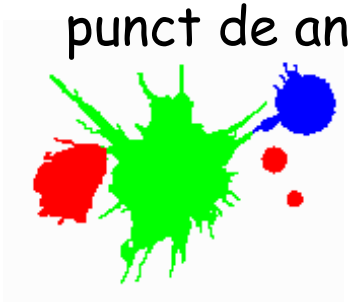
# Folosirea instrumentului *Pen*

- Pentru crearea unei cai *deschise* se executa click pe instrumentul *Pen* cand se termina calea sau se salveaza calea din meniu paletei *Paths.*
- Pentru crearea unei cai *inchise* se executa click pe punctul de pornire ceea ce determina automat incheierea caii (am ajuns la punctul de pornire cand apare un cerculet langa sageata cursor).





- Pentru continuarea unei cai deschise se face click pe ultimul punct de ancora.

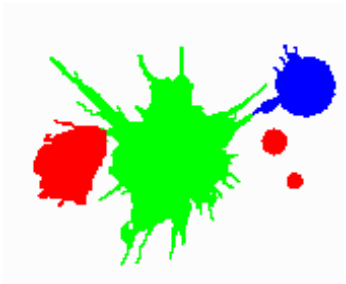




# Folosirea instrumentului Freeform Pen Tool



- Se deseneaza calea dorita cu mana libera
- Cand se elibereaza butonul mouse-ului se transforma automat in cale
- Frecventa punctelor de ancora este data de valoarea data la optiunea *Curve Fit*
- Se poate transforma in *Magnetic Pen* (se comporta similar cu *Magnetic Lasso*) daca se seteaza optiunea cu acelasi nume



# Editarea cailor

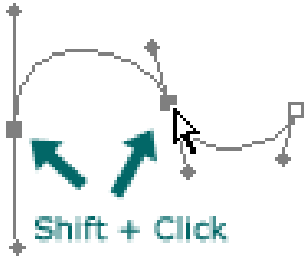
- Punctele de ancorare si segmentele unei cai existente pot fi modificate individual sau ca grup (dupa ce sunt desenate)
- Se modifica un singur punct sau un sigur segment al unei cai cu instrumentul *Direct Selection Tool* sau apasand *Ctrl+click* pe punctul ce se vrea modificat
- Se modifica intreaga cale (ca grup) cu instrumentul *Path Selection Tool*

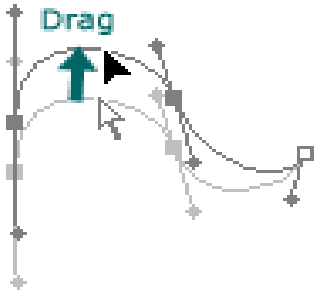


# Editarea cailor
# Mutarea

- Cu ajutorul *Direct Selection Tool* :
  - Se poate muta o cale dreapta (se trage de segment)
  - Se poate muta o cale curba (se selecteaza segmentul, cu *Shift+Click* se selecteaza ambele puncte de ancora si apoi se trage de segment)



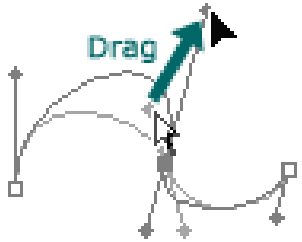
# Editarea cailor
# Modificarea curburii

- Metoda 1: Micsorarea sau marirea
  - Selectati segmentul cu *Direct Selection tool*,
  - Asigurativa ca nu este selectat nici un punct de ancora (sau este selectat numai unul dintre ele – *Shift+Click* pe punct pentru a-l deselecta)
  - *Click* pe segment si tras de ea pentru marire/micsorare



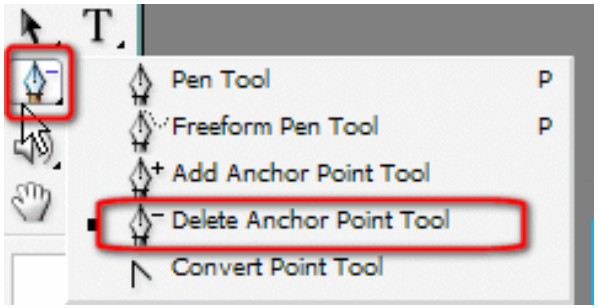
# Editarea cailor
# Modificarea curburii

- Metoda 1: modificarea liniilor de directie
  - Prin modificarea unei linii de directie se vor modifica curburile ambelor segmente de o parte si de alta a punctului de ancora

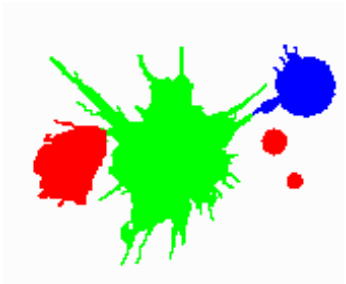


# Modificarea punctelor de ancora

- Pentru stergerea unui punct de ancora pastrandu-se calea se foloseste instrumentul *Delete Anchor Point Tool*



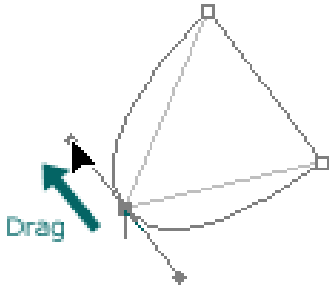

- Pentru adaugarea unui punct de ancora se foloseste *Add Anchor Point Tool*



# Modificarea punctelor de ancora

- Un *smooth point* se poate transforma intr-un *corner point* (si vice-versa) prin *Alt+click* sau cu instrumentul *Convert point*.

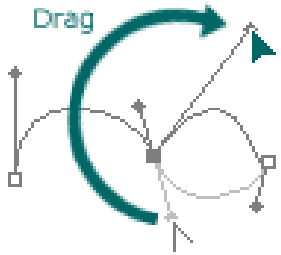
- Pentru a transforma un *corner point* intr-un *smooth point*, se face *Click* pe punct cu *Convert Point Tool* si se trage pentru a face sa apara liniile de directie



# Modificarea punctelor de ancora

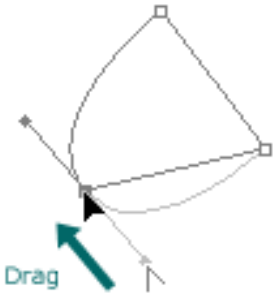
- Pentru a transforma un *smooth point* intr-un *corner point* fara linii de directie se da *Click* odata pe punctul dorit cu *Convert Point Tool*

- Daca se vrea ca punctul de colt sa aiba si linii de directie se face *Click* pe oricare dintre punctele de directie cu *Convert Point Tool* si se trage de punct pana se ajunge la forma dorita



# Modificarea punctelor de ancora

- Daca se doreste ca punctul de colt sa aiba numai o linie de directie - de o parte a punctului de ancora e o cale curba, de cealalta parte e o cale dreapta (care se poate curba la celalalt capat daca se indreapta catre un *smooth point*)
- Folositi *Convert Point Tool* pentru a trage punctul de directie nedorit catre punctul de ancora pana cand dispare



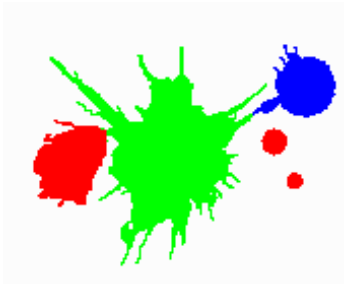


# Redeschiderea si inchiderea cailor



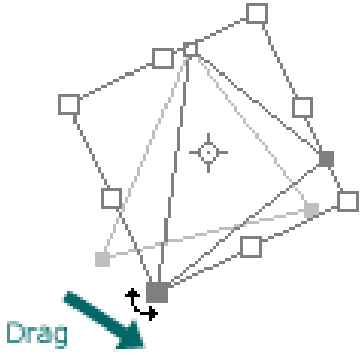
- O cale inchisa se poate redeschide prin selectarea unui segment cu *Direct Selection Tool* si apasarea *Delete* pentru stergerea segmentului

- Doua cai deschise se pot uni cu *Pen Tool* prin unirea punctelor de ancora de la capete



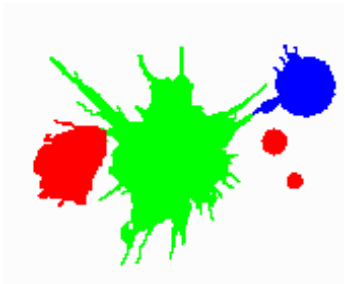
# Transformari geometrice

- *Edit -> Transform*
- Se foloseste *Direct Selection Tool* pentru a manipula puncte individuale si segmente si *Path Selection Tool* pentru a manipula toata calea



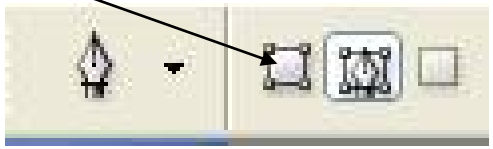




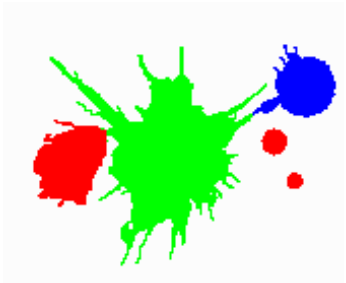


# Forme vectoriale

- Se pot crea tot cu ajutorul instrumentelor *Pen* sau *Freeform Pen* (care include si *Magnetic Pen*) cu optiunea *Shape Layers* selectata

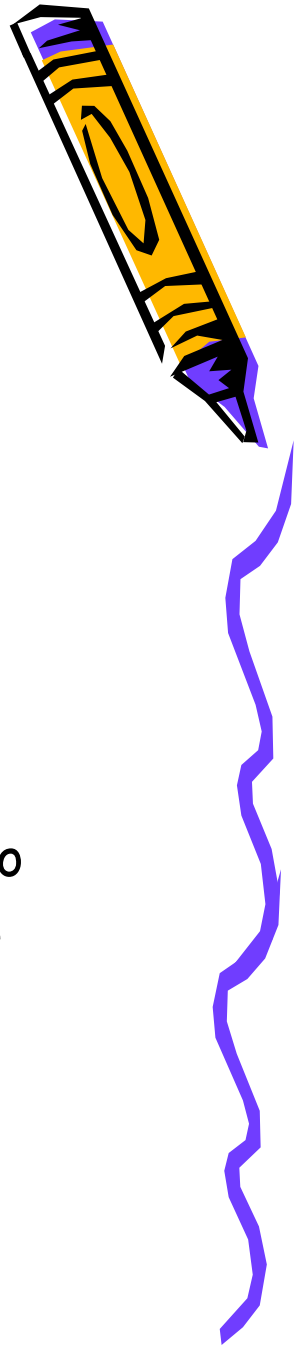


- La inchiderea caii va aparea automat un layer nou de tip *Shape* ce va contine forma
- Layerele de tip *Shape* contin:
  - forma (*shape*): masca de strat
  - umplerea (*fill*): culoare, transparenta, model

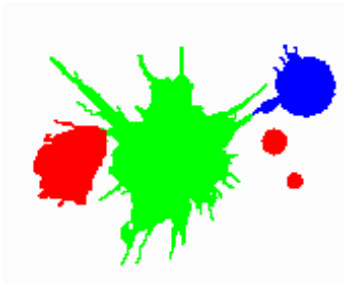




# Forme vectoriale



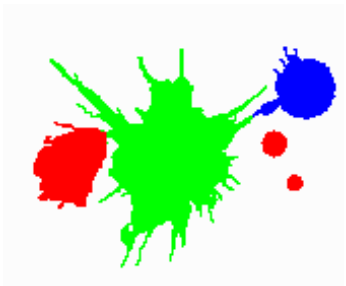
- Culoarea de umplere se poate schimba prin click pe pictograma stratului (ca la un strat de ajustare)
- Forma si dimensiunea se pot modifica cu ajutorul instrumentelor *Path selection* si *Direct selection (*ca la o cale oarecare) si prin transformari geometrice (ca la un strat oarecare).



# Paleta Paths

- Contine caile existente
- Calea ce se deseneaza la momentul actual se numeste *Work Path*

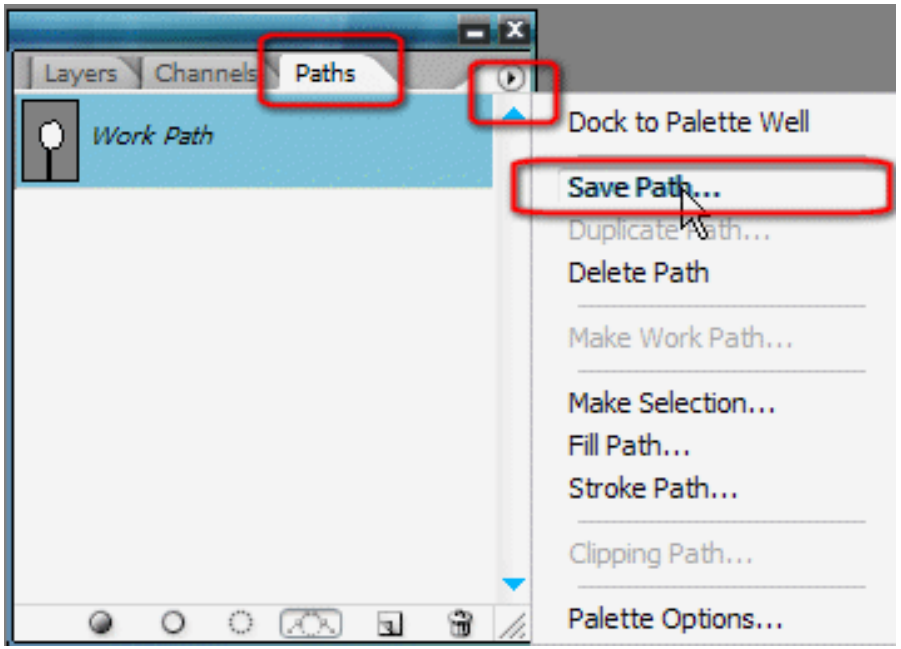


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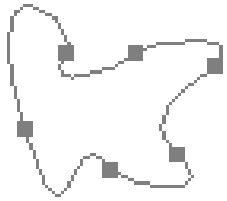
# Paleta Paths

- Salvarea unei cai se face prin redenumirea ei in paleta *Paths* sau din meniu



# Umplerea si trasarea conturului unei cai

- Se poate crea o forma de tip raster dintr-o cale cu ajutorul optiunilor ***Fill Path*** sau ***Stroke Path***



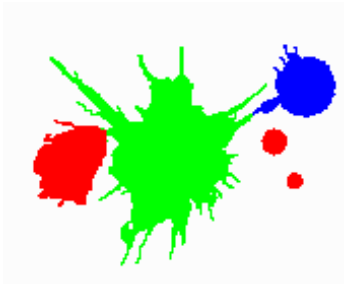
Original path



Path filled with red foreground colour



Path stroked with airbrush selected



# Masti vectoriale pentru un strat

- Avantajul mastilor vectoriale: nu depind de rezolutie
- Transformarea unei cai in masca vectoriala:
  - se selecteaza stratul
  - ***Layer > Vector Mask > Current Path***

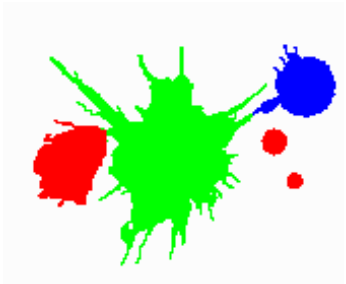




# Caile si textul

- Un strat de tip *text* se poate converti intr-unul de tip *shape*
  - *Click dreapta* pe strat si *Convert Type to Shape*
- Se poate apoi modifica si muta fiecare litera ca si cand ar fi o cale separata umpluta

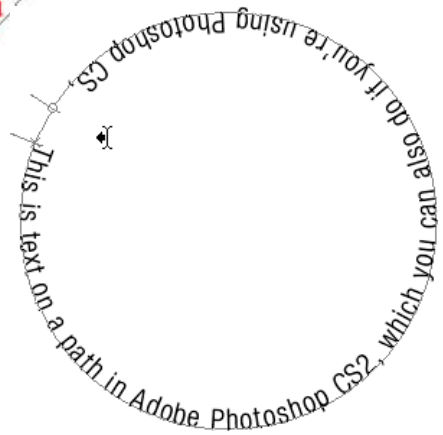


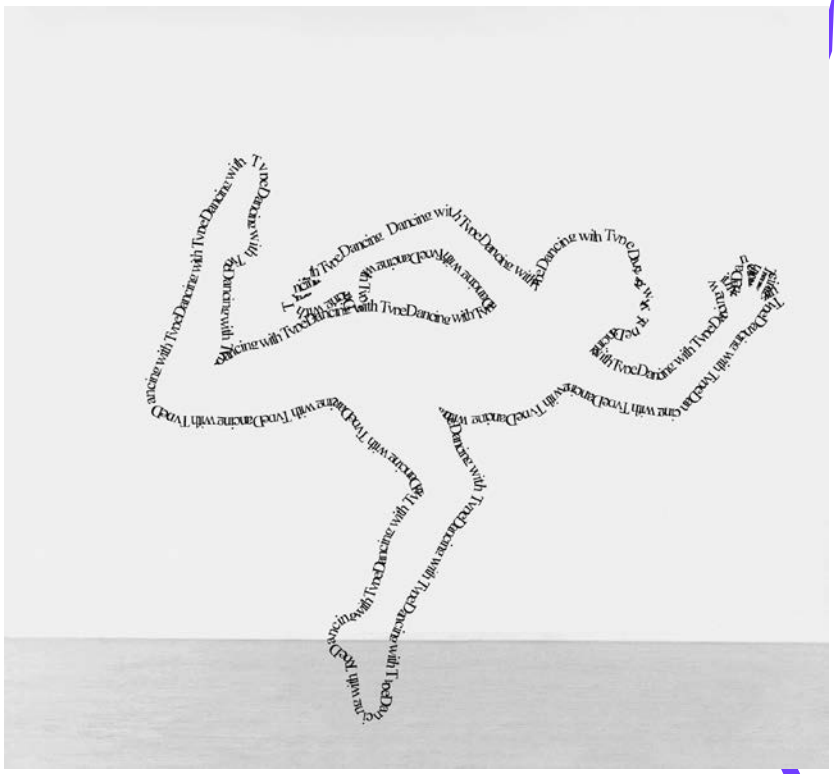



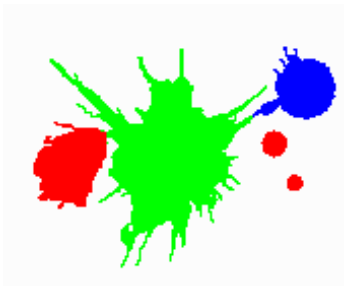
# Caile si textul

- Se poate desena de-a lungul sau in interiorul unei cai





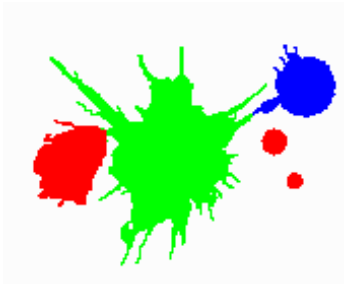
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# Desenarea vectoriala

- Se pot face selectii complexe dintr-o fotografie
- Se pot desena de la inceput diferite forme vectoriale.





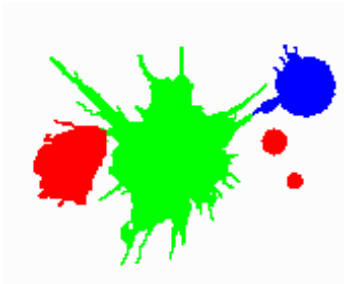
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# Pas 1

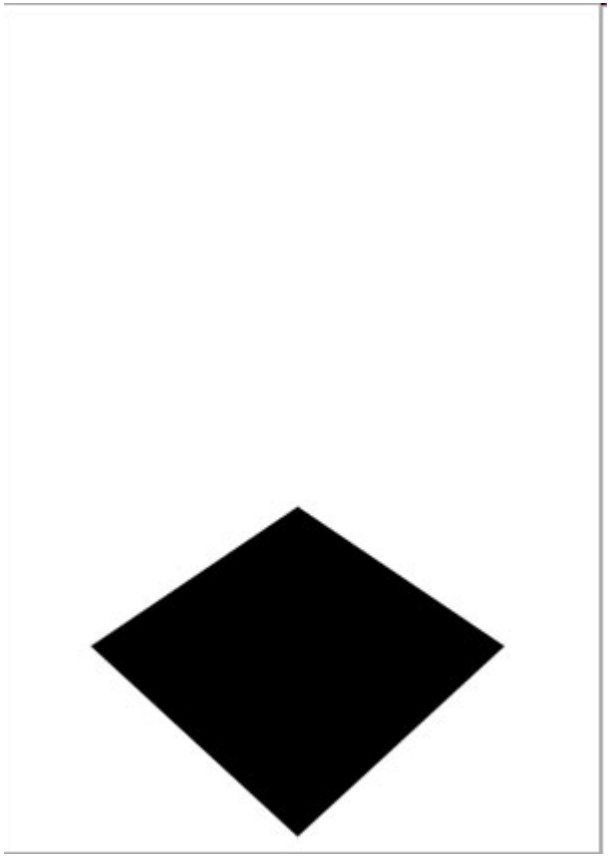
- Se deschide o noua foie de lucru.
- Intr-un nou layer (“box baza”) se deseneaza un patrat.





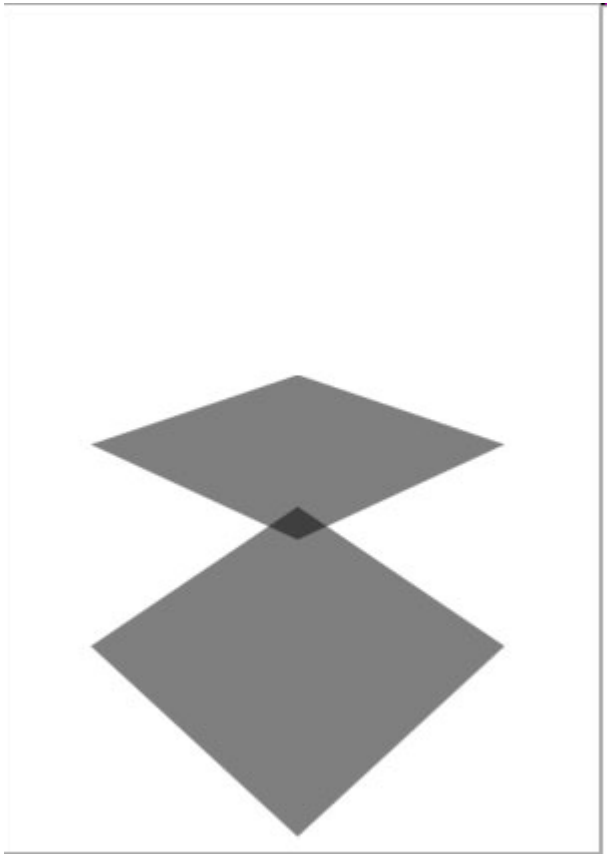
# Pas 2

- Edit -> Transform -> Rotate (45 grade)
- Edit -> Transform -> Distort



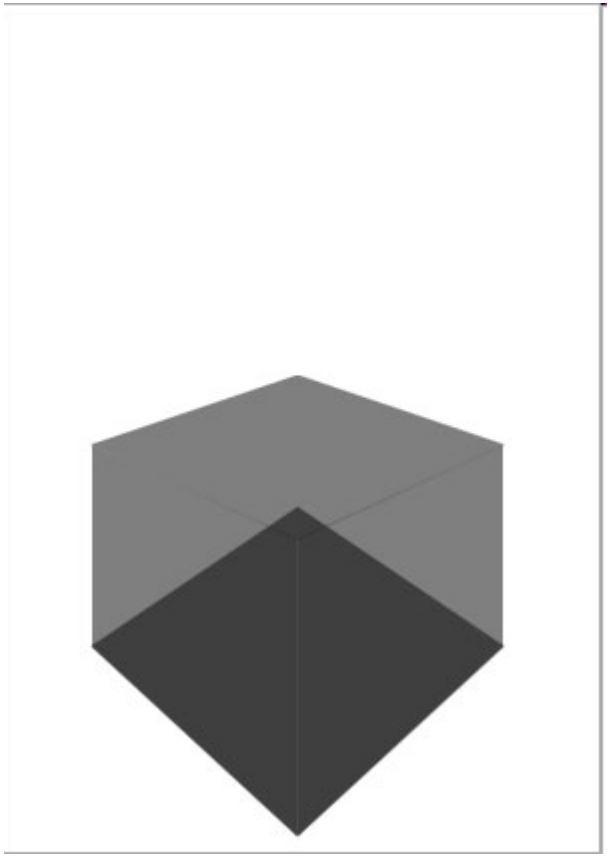
# Pas 3

- Setam opacitatea la 50%
- Creez inca un layer la fel ca acesta (“capac”)



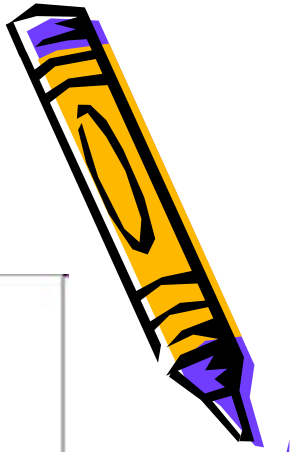
# Pas 4

- Utilizand pen tool-ul desenez intr-un alt layer laturile cutiei.
- Apoi stergem capacul ☺

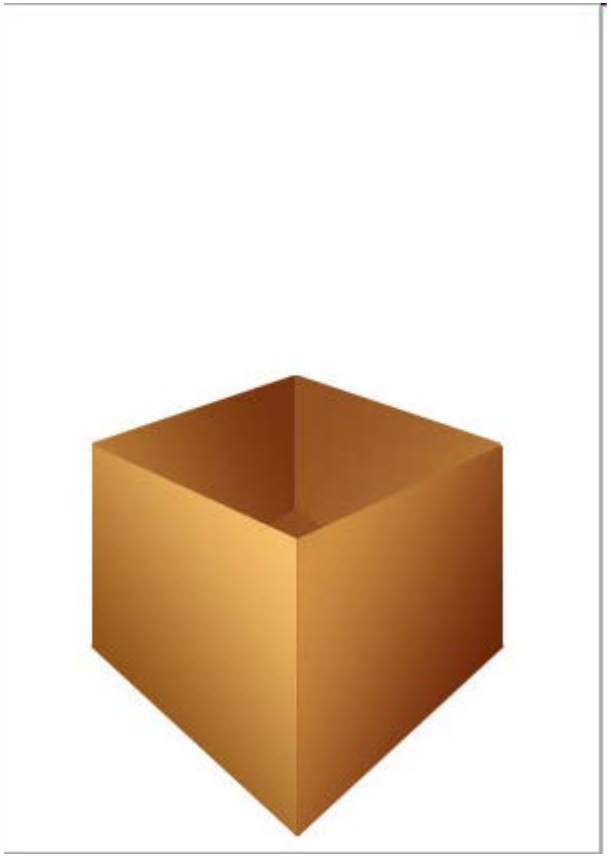


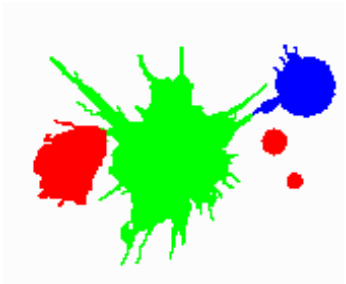


# Pas 5



- Setam un gradient pentru fiecare latura.



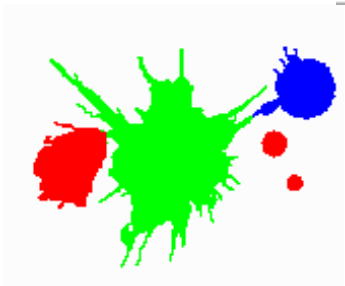


# Pas 6

- Folosind din nou pen tool-ul desenam capacul cutiei deschise. Apoi ii aplicam aceeasi culoare si gradient.







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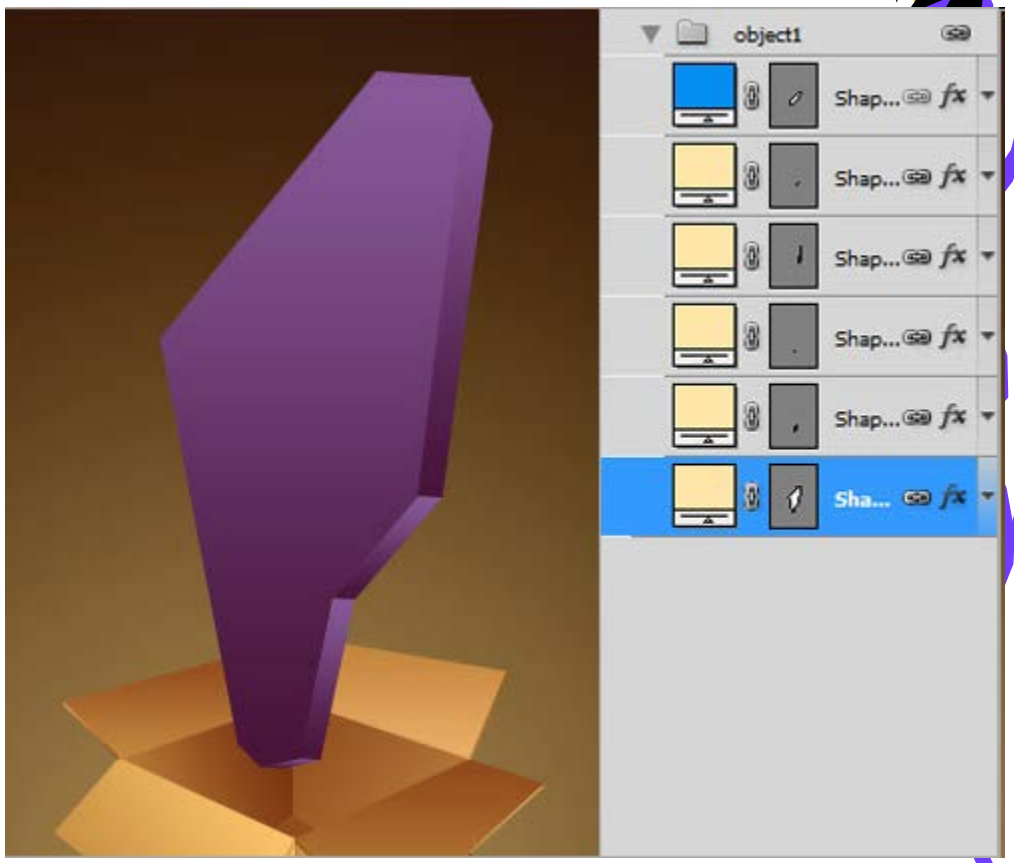
# Pas 7

- Ne intoarcem in background si aplicam un gradient radial cu centrul unde ar trebui sa stea cutia.



# Pas 8-1000…

- Cu multa rabdare se creeaza toate jucariile din cutie. Cu cat mai multa rabdare cu atat mai bine.

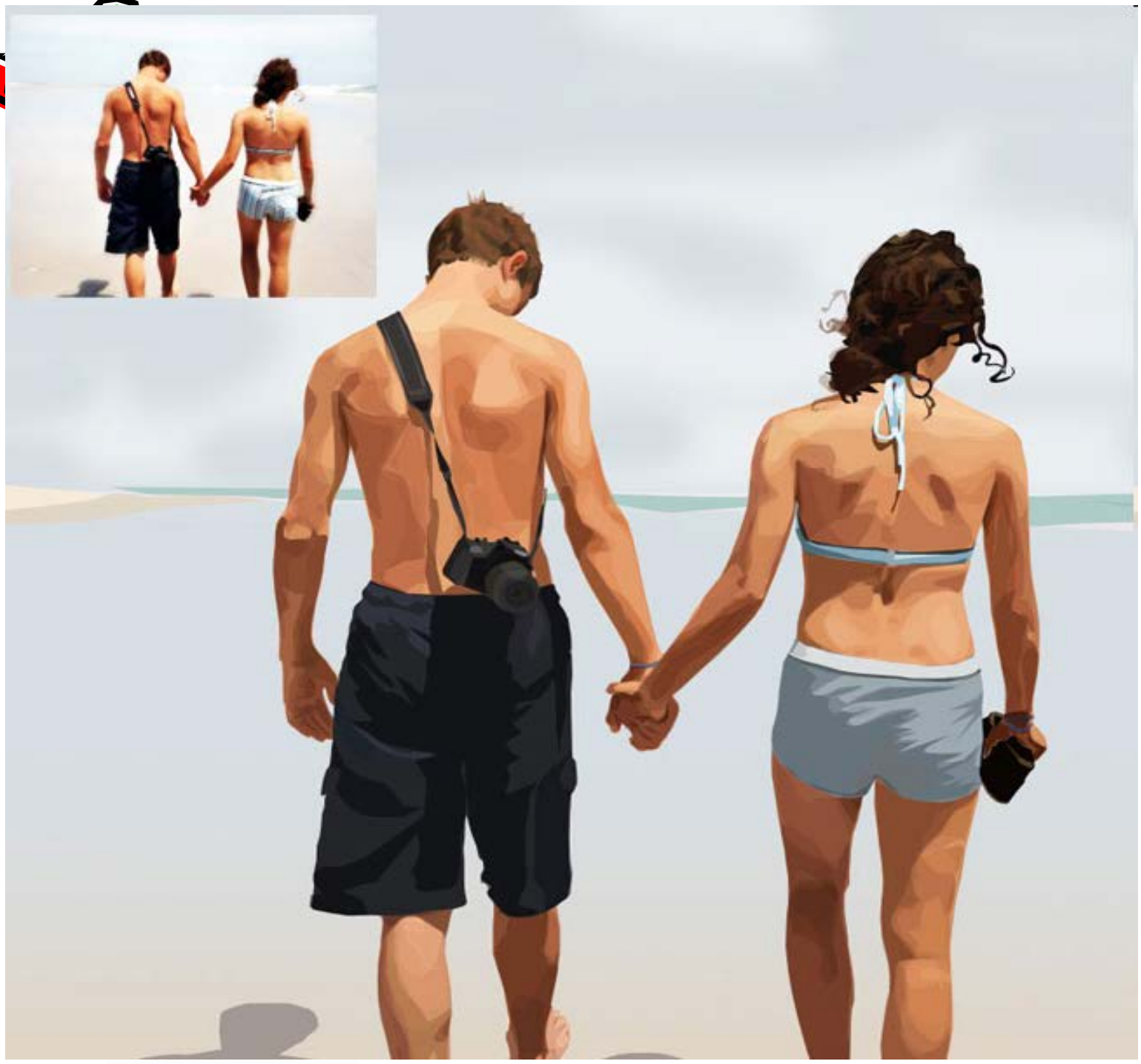




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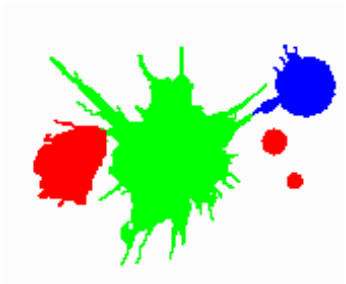






# Smart objects

- Obiecte ce nu depind de rezolutie
- Se pot transforma straturi in *smart objects* prin *Layer->Smart Objects->Group into New Smart Object*
- Se poate modifica numai obiectul de baza si in imagine se aplica modificarile tuturor copiilor acestora



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Multumesc pentru ajutor masterandei Maria Tudorache (TAID 2010)!